COUNTRY REPORTS

THE STATE OF **BELGIUM'S** BIODIVERSITY FOR FOOD AND AGRICULTURE

منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Alimentación y la Agricultura

Guidelines for the preparation of the Country Reports for *The State of the World's Biodiversity for Food and Agriculture*

November 30, 2013

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Country: Belgium

National Focal Point: Cindy Boonen

INSTRUCTIONS FOR DYNAMIC GUIDELINES

How do I complete the dynamic guidelines?

1. You will require Adobe Reader to open the dynamic guidelines. Adobe Reader can be downloaded free of charge from: http://get.adobe.com/uk/reader/otherversions/. Use Adobe Reader Version 10 or higher.

2. Open the dynamic guidelines and save it (save as -> pdf) on your hard drive.

3. Please rename it <name of your country>.pdf.

4. You may forward the dynamic guidelines to stakeholders you would like to involve or inform by e-mail. You may also print and/or save the dynamic guidelines.

5. It is advisable to prepare textual responses (including any formatting such as bullet points) first in a separate document and then to copy and paste them into the form. Please use font Arial 10. Acronyms and abbreviations should be avoided if possible. If included, they must be introduced (i.e. written out in full) the first time they are used. Note that the text boxes are expandable. Once text has been entered, the box will automatically enlarge to make its content fully visible when you click outside its border.

6. When you have finished completing the dynamic guidelines, click the “Submit by Email” button on the last page and send the completed dynamic guidelines to SOW-BFA@fao.org. This should automatically attach the document to an email that you can then send. Otherwise, please attach the completed dynamic guidelines manually to an e-mail and send it to SOW-BFA@fao.org. A letter confirming official endorsement by relevant authorities should also be attached to the email.

7. You will receive a confirmation that the submission was successful.

Where can I get further assistance?

Should you have any questions regarding the dynamic guidelines, please address them by e-mail to SOW-BFA@fao.org.

How, by whom and by when must the completed dynamic guidelines be submitted?

Once officially endorsed by the relevant authorities, the completed dynamic guidelines should be submitted (click the “Submit by Email” button on the last page) by the National Focal Point. Completed dynamic guidelines should be sent **by December 31st, 2014**.

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THE ESSENTIAL ROLE OF COUNTRY REPORTS

The preparation of Country Reports is one of the most important steps in the process for preparing the first report on *The State of the World's Biodiversity for Food and Agriculture* (the SoWBFA Report), and will be critical in filling in gaps to existing information and establishing baseline information on biodiversity for food and agriculture, and on its role in providing multiple ecosystem services. The preparatory process of Country Reports should also be considered a strategic planning exercise and the report generated an overview of the country's sustainable management practices of biodiversity for food and agriculture and a tool for the assessment of national priorities and future needs to be addressed. Country Reports should also be seen as an opportunity to engage and stimulate the interests of a wide range of stakeholders from different sectors, and including smallholders.

The present Guidelines for Country Reports (Guidelines) aim to help countries to assemble baseline information and highlight the importance of a collaborative process, bringing together experts (including those stakeholders with experiential knowledge, such as farmers, pastoralists, forest dwellers and fisher folk) across sectors to assess available information and analyze gaps and needs. The Guidelines are also structured as a tool to guide data collection, planning and policy making at national level.

The Guidelines make a distinction between information countries may wish to provide in support to their own strategic planning, from the information needed for the preparation of the overall SoWBFA report. Countries may wish to draw upon documents prepared for the various sector State of the World's Reports for their cross-sectoral synthesis.

I. INTRODUCTION

1. The FAO Commission on Genetic Resources for Food and Agriculture (the Commission) is the only intergovernmental forum which specifically deals with the whole range of genetic resources for food and agriculture. Genetic resources for food and agriculture are the building blocks of biodiversity for food and agriculture. The mandate of the Commission covers all components of biodiversity for food and agriculture. To implement its broad work programme and to achieve its objectives through a planned and staged approach, the Commission adopted and subsequently revised and updated its Multi-Year Programme of Work (MYPOW). CGRFA-14/13/Report, *Appendix I*, Table 1.

2. One of the major milestones of the MYPOW is the presentation of the first report on *The State of the World's Biodiversity for Food and Agriculture* (the SoWBFA Report) to the Commission's Sixteenth Regular Session (to be held in 2017) and the consideration of follow-up to the SoWBFA Report, including through a possible Global Plan of Action. The SoWBFA Report will also be a major milestone in the context of the United Nations Decade on Biodiversity.

3. The Commission requested FAO, at its Eleventh Regular Session in 2007, to prepare the SoWBFA report, for consideration at its Sixteenth Regular Session, following a process agreed upon by the Commission. CGRFA-11/07/Report It stressed that the process for preparing the SoWBFA Report should be based on information from Country Reports and should also draw on thematic studies, reports from international organizations and inputs from other relevant stakeholders, including centres of excellence from developing countries. CGRFA-14/13/Report, paragraph 14.

4. The Commission stressed that the SoWBFA Report should focus on the interactions between sectors and on cross-sectoral matters, taking full advantage of existing information sources, including sectoral assessments. It also suggested that

priority be given to key supplementary information not available in existing sources. CGRFA-14/13/Report, paragraph 14.

5. The Commission acknowledged that the report's findings would be preliminary and incomplete in a number of areas and requested FAO to ensure that such information gaps would be assessed and highlighted in the report. It also requested FAO to include in the report lessons learned and success stories on the conservation and sustainable use of biodiversity for food and agriculture. CGRFA-14/13/Report, paragraph 15.

6. The SoWBFA Report will provide a baseline analysis of the state of knowledge. Incompleteness and gaps in available information should be clearly identified and acknowledged and used to direct future assessments. In compiling information for their Reports countries should state clearly where information is not available on specific subject areas.

7. The present Guidelines for the preparation of Country Reports contributing to the SoWBFA Report present an overall approach and a set of objectives that can guide the preparation of Country Reports, the scope of the report and the structure that can be used, as well as an appropriate timeline and process for their preparation.

8. The Guidelines assist countries to provide information complementary to sector reports in order to address the following questions:

- What is the state of the conservation and use of biodiversity for food security and nutrition, ecosystem services and sustainability?
- What trends can be identified in the conservation and use of biodiversity for food and agriculture and in the effects of major drivers of change?
- How can conservation and use of biodiversity for food and agriculture be improved and the contributions of biodiversity to food security and nutrition, ecosystem services, sustainability and the improvement of livelihoods of farmers, pastoralists, forest dwellers and fisher folk be enhanced?

9. Major differences exist between countries with respect to the nature, conservation and use of biodiversity for food and agriculture. To provide baseline information, highlight knowledge gaps and to facilitate the regional and global synthesis of the information countries are therefore invited to follow the structure provided in the Guidelines as closely as possible in the preparation of their Country Report.

II. OBJECTIVES OF THE GUIDELINES

10. These Guidelines have been prepared by FAO to assist in the preparation of Country Reports contributing to the SoWBFA Report. The Guidelines have been designed to assist countries to undertake a strategic assessment of their biodiversity for food and agriculture, with particular emphasis on components of biodiversity for food and agriculture that are not traditionally considered by the other sectoral assessments and yet contribute to the livelihoods of smallholder communities. These include uncultivated or wild food and non-food products, as well as species of importance to production systems.

III. SCOPE, STRUCTURE AND CONTENT

Scope of the Country Report

11. The scope of the Country Reports includes the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the structures, functions and processes in and around production systems, and that provide food and non-food agriculture products. A detailed description of the scope of the Country Report is provided in Annex 1. Production systems, as defined for the purposes of this report, include the livestock, crop, fisheries and aquaculture, and forest sectors (description provided in Annex 2).

12. The present Guidelines for the Country Report mainly focus on those areas not covered by sectoral reports, e.g. the biological diversity associated with different supporting and regulating ecosystem services within production systems or of importance to them, referred to hereinafter as associated biodiversity, as well as wild resources used for food. In addition to this, countries that previously presented or are currently preparing a Country Report on Plant, Animal, Aquatic or Forest Genetic Resources may wish to integrate information from these reports in the preparation of their Country Report for the SoWBFA.

13. The Guidelines should help countries to provide information from an ecosystem perspective, including on the provision of ecosystem services, and on the implementation of an ecosystem approach. They will also assist countries to report on the use of biodiversity for food and agriculture for food security and nutrition, rural livelihoods, sustainability and sustainable intensification as well as on relevant gender perspectives. In this way, the Guidelines will assist countries in describing the multiple functions and the multiple values to producers and users of biodiversity for food and agriculture.

Structure of the Country Report

14. An Executive Summary is recommended, along with a section providing an Introduction to the Country, which would provide a description of the country and an overview of the different sectors.

15. Country Reports should follow as closely as possible the structure of the SoWBFA Report as presented in CGRFA-14/13/3 Appendix 1, which includes the following Chapters:

Chapter 1: Introduction
Chapter 2: Drivers of change
Chapter 3: The state and trends of biodiversity for food and agriculture
Chapter 4: The state of use of biodiversity for food and agriculture
Chapter 5: The state of interventions in the conservation and use of biodiversity for food and agriculture
Chapter 6: Future agendas for conservation and sustainable use of biodiversity for food and agriculture

16. An analysis of the different ways in which biodiversity for food and agriculture is used and supports cultural, social and economic values of local communities and traditional peoples will be an important aspect of the SoWBFA Report and of Country Reports. The Country Reports should therefore take full account of these aspects and seek the involvement of the widest range of stakeholders. In this respect, it is recommended that the scope of activities includes actions being taken by the public, private and nongovernmental sectors, and takes account of gender perspectives, and the needs, priorities and perspectives of indigenous peoples and local communities through their organizations.

IV. TIMELINE AND PROCESS

17. In line with the overall process, as established by the Commission, the Director-General of FAO sent a Circular State Letter on 10 June 2013 to countries requesting them to identify National Focal Points for the preparation of Country Reports by November 30, 2013, and invited countries to submit their Country Reports no later than 31 December 2014.

18. The following steps are recommended in preparing the Country Report, using a participatory approach:

- Each participating country should appoint a National Focal Point for the coordination of the preparation of the Country Report who will also act as focal point to FAO. National Focal Points should be communicated to Ms Linda Collette, Secretary, Commission on Genetic Resources for Food and Agriculture (cgrfa@fao.org), by November 30, 2013**.**
- Countries are encouraged to establish a national committee to oversee the preparation of the Country Report. Given the cross-sectoral nature of the Country Report, the national committee should consist of as many representative stakeholders as practical (representing government, research and civil society) including from different sectors (fisheries and aquaculture, forest, livestock and plants) and those able to support analysis of associated biodiversity. It is recommended that the national committee also include a gender specialist along with someone who can contribute to economic issues, with a natural resource management, environmental economics, or other relevant background. It is recommended that within the 13 months countries are given for the preparation of the Country Report, the national committee meets frequently to review progress and consults widely with key stakeholders.
- The national committee may find it useful to establish cross-sectoral and inter-departmental/inter-ministerial working groups to compile data and information for specific sections of the Country Report, or to write specific chapters of the Country Report.
- The National Focal Point should coordinate the preparation of the first draft of the Country Report, which should be reviewed by the national committee. The National Focal Point should facilitate a consultative process for broader stakeholder review, including stakeholders from various ministries, departments, NGOs, research institutions, and stakeholders with experiential knowledge, such as farmers, pastoralists, forest dwellers and fisher folk, etc.
- Following the stakeholder review, the National Focal Point should coordinate the finalization of the Country Report, submit it to the government for official endorsement and transmit it to FAO in one of the Organization's official languages (Arabic, Chinese, English, French, Russian and Spanish) by 31 December 2014. The Country Report will be an official government report.
- If countries are unable to submit final Country Reports by the set deadline, preliminary reports of findings should be provided to FAO to contribute to the identification of global priorities for inclusion in the SoWBFA Report.

The FAO contact for the preparation of Country Reports is:
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Commission on Genetic Resources for Food and Agriculture
Food and Agriculture Organization of the United Nations
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Fax: +39 0657055246
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V. DETAILED METHODOLOGY AND GUIDANCE BY CHAPTER

The guidelines outline the suggested content and provide questions to assist countries to undertake their strategic analysis and develop each section of their Country Report. The questions are provided to facilitate analysis, to stimulate discussion and to ensure that the Country Report contains strategic directions that address priorities and needs. Questions that are critical to enable basic understanding of the conditions in your country and facilitate regional and global synthesis of the data and information collected are indicated in **bold**. Please try to ensure that data and information are provided for these questions wherever such information is available.

Questions are organized and formulated in relation to the production systems that are present in your country. Thus it is very important to fill in Table 1 in the Introduction to establish a list of production systems that will be used throughout the Guidelines.

EXECUTIVE SUMMARY

It is recommended that the Country Report contains an executive summary of 2-3 pages highlighting the main findings of the analysis and providing an overview of key issues, constraints and existing capacity to address the issues and challenges. The executive summary should indicate trends and driving forces and present an overview of the proposed strategic directions for future actions aimed at the national, regional and global levels.

The writing of this Belgian country report was an excellent occasion to bring the different authorities and public research centres from the different governments, federal and regional, agricultural and environmental, closer together to collect all the available information on the biodiversity for food and agriculture: the state, trends, threats, gaps of knowledge, constraints, action plans and future agendas. The preparation of this country report has taken about 18 months of discussions within a working group, bringing together the necessary data, exchanging the information, compiling and editing the texts and the organisation of a stakeholder consultation before the final validation procedure in September 2015. The report includes many references to scientific studies, published nationally and internationally.

In Chapter 1 of this report, a general overview of Belgium is given. Belgium is a Western European country with a mild (temperate) climate and diverse landscapes and geography, having a high population density and industrialisation level. Institutionally, Belgium is divided into three regions: Flanders in the north of the country, Wallonia in the south and the Brussels Capital Region in the centre, mainly competent for both the agricultural and environmental policies. Due to the geographical differences between the regions, many aspects in this report were therefore reported separately.
The agricultural sector in Belgium is characterized by a labour intensive and highly specialized, small scale and export oriented primary production.
The Belgian sea fisheries sector is small and a minor aquaculture sector is present but growing.
The naturally regenerated forests are mainly located in Wallonia, but planted forests are present in the whole of the country, generating a considerable economic activity (wood production).
The production systems that are relevant in Belgium are the following:
* Livestock grassland-based systems: Temperate (L3)
* Livestock landless systems: Temperate (L7)
* Naturally regenerated forests: Temperate (F3)
* Planted forests: Temperate (F7)
* Self-recruiting capture fisheries: Temperate (A3)
* Fed aquaculture: Temperate (A11)
* Rain fed crops: Temperate (C11)
* Mixed systems (livestock, crop, forest and/or aquatic and fisheries): Temperate (M3)

Chapter 2 focusses on the main drivers that affect ecosystem services in agricultural production systems. The main drivers in Belgium effecting biodiversity, in a mostly negative way are changes in land use and management, the use of pesticides, the population growth and urbanisation and pollutants and external inputs. The effect on wild foods has not been studied in detail, but still it is clear that policies (regulating for example hunting game, mushroom picking, the exploitation of the forests and fishing quota) are necessary and effective to optimally conserve wild foods.

In general, it has been shown that agricultural and environmental policy actions and specific countermeasures to attack the above negative effect of the main drivers effected the biodiversity for food and agriculture and all (regulating and and supporting) ecosystem services in agricultural production systems positively. Some examples are reported in chapter 3: in situ and ex situ conservation and breeding programs, monitoring plans, reintroduction of fish in the aquatic environment, support for the development of early warning systems (as a basis for Integrated Pest Management), etc.

To have a clear view on the state of the current use of the biodiversity for food and agriculture in Belgium, chapter 4 describes the current management practices having a positive effect on biodiversity: integrated pest management (compulsory by legislation), landscape management , agroforestry (subsidised but at the moment rather marginal), organic agriculture (strongly supported to stimulate farmers to conversion), soil management, (re)forestation, etc.

Chapter 5 elaborates on the policies Belgium has introduced to support the conservation and the sustainable use of biodiversity for food and agriculture. The main policy instruments used, are legislation (for example cross compliance and the rural development plans (RDP) within the EU Common Agricultural Policy (CAP)), action plans (for example the National Biodiversity Strategy, the bee action plan, the operational fisheries program), quota systems (fisheries), financial support (subsidies for research and monitoring systems), extensive training and higher education programs offered by the universities and other public or private organisations.

Looking at the future, in chapter 6, focus is mainly on the further implementation of the action plans, strategies and programs that have been decided before, like in the (updated) Belgian Biodiversity Strategy 2006-2016,, the new CAP and RDP, etc.

In conclusion, it can be said that Belgium, as a highly dense, urbanized and industrialized country where agriculture has strongly intensified over the last 50 years, biodiversity and ecosystems are constantly under pressure. Therefore good policies, programs and management practices are necessary and already put in place to counter the negative impact of this industrialisation. Many actions have been taken, in the agricultural as well as in the environmental domain, nationally, regionally or at the level of the European Union, of which a positive effect has been proven. Nevertheless, many knowledge gaps remain unfilled and could be the subject of further research and further action to conserve and support (associated) biodiversity for food and agriculture in the future.

CHAPTER 1: Introduction to the Country and to the role of biodiversity for food and agriculture

Proposed structure of the chapter and information to be included in the Country Reports

The first objective of this Chapter is to present an overview that will help the reader appreciate the context for the Country Report by providing a general overview and summary of the features, demographics and major trends in overall biodiversity for food and agriculture in the country. Explicit attention should be given to associated biodiversity, ecosystem services and wild foods.

Countries that previously presented or are currently preparing a Country Report on Forest, Aquatic, Animal or Plant Genetic Resources, should be able to use some of the background information contained in these reports to prepare parts of their introductory section.

In this Chapter, countries will create a list of their different production systems that will be frequently referred to in subsequent chapters.

This chapter will seek information on the following topics:

- Basic information on the size and location of the country; its main physiographic and climatic features; human population;
- A synthesis of the current situation with respect to the current and potential contribution of biodiversity for food and agriculture to food security and nutrition, ecosystem health and sustainability of production systems, as supported by associated biodiversity and ecosystem services. Specific attention is also given to wild foods;
- Description of the different production systems within the country, as well as an overview of their importance to the national economy and rural livelihoods.

Preparation of the Country Report

1. Provide a description of the process that was followed in preparing the Country Report, preferably providing the names (with affiliations and addresses) of the participants, including all stakeholders consulted.

In Belgium, many governments and public authorities are involved in the conservation of and policy on biodiversity, therefore all these actors – primarily from the environmental and agricultural domain – had to be brought together to prepare this country report through a participatory process. Since this is an assignment from the FAO and the report focusses on food and agriculture, Belgian National Focal Point (NFP) for the preparation of the report has been officially designated within the agricultural public services (end of 2013). Colleagues from all federal and regional authorities and public research centres were invited in a kick-off meeting early 2014 to start collecting all relevant information on the wide range of topics that are asked for in the report and to seek for engagement to divide the work of the writing itself. Several meetings and many emails have resulted in the document presented here today. The data that have already been included in completed or ongoing Country Reports on Genetic Resources, have not been repeated in this report.
In May 2015, stakeholders within the environmental and agricultural domain (see also list in No. 77 of this report) have had the opportunity to make written comments to the draft report before finishing the editing process.
The making of this report has proven to be a challenging exercise to cooperate and collaborate in an efficient way, finally reaching our goal, i.e. a comprehensive assessment of Belgium's biodiversity for food and agriculture. It was very positive that colleagues from different backgrounds got to meet and know each other better, facilitating future policy actions in the biodiversity domain and that information, available in different entities, has been brought together to have a better overview on the overall Belgian situation.
A sincere THANK YOU to all that have participated and contributed to this report!

General overview of the country

2. In a few paragraphs, provide a synthetic overview of your country, including the size, location, main physiographic and climatic features. Include a section on human population, providing disaggregated data on women and men contribution and involvement in agriculture. Briefly discuss as well the overall nature and characteristics of the economy, including the contribution of the different sectors. You may wish to draw upon the country overviews provided in the first chapters of previous and ongoing Country Reports on Forest, Aquatic, Animal or Plant Genetic Resources.

Belgium is a small Western-European country and features a mild climate, a high population density as well as a high industrialization level. Belgium is one of the most densely populated and commercial regions worldwide.

Landscape:
Belgium shows diverse landscapes being a perfect illustration of the various geographical aspects of Western Europe. Despite its limited surface and its high population density, Belgium provides remarkable natural assets. The relief, the soil, the surface and the climate constitute a coherent system. The altitude and the differences in relief in relation to the hydrographic network, are the basic indicators of a geophysical division. Several agrogeographic regions can for instance be distinguished from north to south.

Population:
In 2013, Belgium had some 11,161,642 inhabitants on a surface of 30,528 km². The population density is slowly rising: 327 inhabitants/km² in 1990, 332 inhabitants/km² in 1995, 342 inhabitants/km² in 2005 and 355 inhabitants/km² in 2010. The population is unevenly distributed. Flanders, situated in the north of country, accounts for 44.3% of the nation's surface and for 58.0% of the nation's population, whereas Wallonia, situated in the south of the country, accounts for 55.2% of the nation's surface and for 32.5% of the nation's population. Consequently, population density in the north reaches almost 462 inhabitants/km², whereas the south approximately features 208 inhabitants/km². In the Brussels Capital Region the population density amounts to 6,751 inhabitants/km².

Gross value added:
Information published by the Belgian National Bank shows that the share of the primary sector (agriculture, forestry and fisheries) accounted for 0.74% of the 2012 national Gross value added (GVA). This represents a GVA in current figures of 2,487.9 million euro. The industry's share amounted to 21.8% and the services' sector to 77.4%.

Agriculture:
Agricultural policies are defined on a regional level, i.e. by the three Regions (Flanders, Wallonia and the Brussels Capital Region). Belgian agriculture is mainly labour intensive, highly specialised, small scale and export-oriented. The focus is on

animal production, cereals, fruit and vegetables and horticulture. As far as the more southern part of the country is concerned, agriculture has a more extensive character with mainly dairy farms and beef cattle farms.
In 2013, Belgium had some 37,761 agricultural businesses officially employing 74,510 people. About 80% of them are unpaid family workers. Two third of the 75,000 agricultural workers are men, only one third are women. Approximately 1.54% of the active population is employed in the agricultural sector. The number of agricultural businesses decreases every year. The total surface used for agriculture amounted to 1,333,913 hectares in 2012.
Category Surface 2012 (1000 ha): cereals 341.8; industrial crop 92.0; potatoes 67.0; dried pulses 1.7; forage crop 251.7; fallow land 8.5; permanent pasture 507.2 (Source: ADSEI Agricultural survey 2012).
The average area of an agricultural business in Wallonia (with at least one full-time agricultural worker) is 64 hectares (2012). Agricultural businesses in Flanders generally represent 24.5 hectares (2012).

Sea fisheries sector:
In the beginning of 2013, the Belgian fisheries fleet consisted of 83 vessels with a global engine capacity of 47,554 kW and a tonnage of 15,053 GT.
The total landings in all Belgian ports amounted in 2013 to 16,349 tonnes, a decrease by 7% in comparison with 2012. The total value of the landings amounted to 56.9 million euro, a decrease by 11% in comparison with 2012. Plaice, sole and skate were the main fish species caught in 2013.

Aquaculture:
The Belgian aquaculture production in 2011 was estimated at a volume of 50 tonnes and a global value of 218,480 euro.
The Flemish aquaculture industry is small, but nevertheless diverse. Some twenty aquaculture businesses operate on a small scale, often as a secondary occupation or as a leisure activity. Their production level is quite modest. The main species they catch are carp, sturgeon, shellfish, game fish and ornamental fish (Van Bogaert, et al., 2014). A recent survey has shown that in 2012, 17 Flemish businesses bred aquatic organisms, mainly in open ponds. In Wallonia, production is largely small-scale, semi-intensive, with a low environmental impact given the sector's small size. Wallonia's production, around 200 tonnes annually, is focused on brown trout and rainbow trout production, mostly for recreational fishing in public waters or private ponds.

Forestry:
The surface of forestry in Flanders amounted to 185,686 ha in 2013. In Wallonia, the naturally regenerated forest amounted to 255,100 ha and the planted forests to 268,600 ha.
The Gross value added of the Belgian forest industry amounted to 114.8 million euro in 2011. 2,700 people are employed in the forest industry (Eurostat).

Role of biodiversity for food and agriculture

Countries that previously presented or are currently preparing a Country Report on Forest, Aquatic, Animal or Plant Genetic Resources, should be able to use some of the background information contained in these reports to prepare this part of their introductory section. Detailed information on associated biodiversity, ecosystem services and wild foods will be provided in chapters 2, 3, 4, and 5 of the Country Report, and thus, countries may wish to consider developing this section after completing the main body of the Country Report.

3. Provide a summary of the role of biodiversity for food and agriculture in improving food security and nutrition, the livelihoods of farmers, pastoralists, forest dwellers and fisher folk, ecosystem health and sustainability of production systems in your country. Specific attention should be given to associated biodiversity, ecosystem services and to wild foods. The summary should also draw attention to the *ex situ* and *in situ* conservation of biodiversity for food and agriculture, the most significant aspects of use to improve food security and nutrition in the country, major changes observed in the last 10 years and the main factors causing changes. Significant risks or dangers to the conservation and use of biodiversity for food and agriculture may also be highlighted.

Not specifically studied in Belgium.

Production systems in the country

IMPORTANT: Throughout these guidelines, questions on production systems will refer to the production systems identified in Table 1 as present in your country.

4. Indicate, for each of the production systems listed in Table 1 below, whether it is found in your country or not, regardless of its importance.

Table 1. Production systems present in the country.

Sector	Code	Production system names (Place pointer on the production system name for a detailed description)	Check if present in the country
Livestock	L1	Livestock grassland-based systems: Tropics	☐
	L2	Livestock grassland-based systems: Subtropics	☐
	L3	Livestock grassland-based systems: Temperate	☒
	L4	Livestock grassland-based systems: Boreal and /or highlands	☐
	L5	Livestock landless systems: Tropics	☐
	L6	Livestock landless systems: Subtropics	☐
	L7	Livestock landless systems: Temperate	☒
	L8	Livestock landless systems: Boreal and /or highlands	☐
Forest	F1	Naturally regenerated forests: Tropics	☐
	F2	Naturally regenerated forests: Subtropics	☐
	F3	Naturally regenerated forests: Temperate	☒
	F4	Naturally regenerated forests: Boreal and /or highlands	☐
	F5	Planted forests: Tropics	☐
	F6	Planted forests: Subtropics	☐
	F7	Planted forests: Temperate	☒
	F8	Planted forests: Boreal and /or highlands	☐
Aquaculture and Fisheries	A1	Self-recruiting capture fisheries: Tropics	☐
	A2	Self-recruiting capture fisheries: Subtropics	☐
	A3	Self-recruiting capture fisheries: Temperate	☒
	A4	Self-recruiting capture fisheries: Boreal and /or highlands	☐
	A5	Culture-based fisheries: Tropics	☐
	A6	Culture-based fisheries: Subtropics	☐
	A7	Culture-based fisheries: Temperate	☐
	A8	Culture-based fisheries: Boreal and /or highlands	☐
	A9	Fed aquaculture: Tropics	☐
	A10	Fed aquaculture: Subtropics	☐
	A11	Fed aquaculture: Temperate	☒
	A12	Fed aquaculture: Boreal and /or highlands	☐
	A13	Non-fed aquaculture: Tropics	☐
	A14	Non-fed aquaculture: Subtropics	☐
	A15	Non-fed aquaculture: Temperate	☐

	A16	Non-fed aquaculture: Boreal and /or highlands	☐
Crops	C1	Irrigated crops (rice) : Tropics	☐
	C2	Irrigated crops (rice) : Subtropics	☐
	C3	Irrigated crops (rice) : Temperate	☐
	C4	Irrigated crops (rice) : Boreal and /or highlands	☐
	C5	Irrigated crops (other) : Tropics	☐
	C6	Irrigated crops (other) : Subtropics	☐
	C7	Irrigated crops (other) : Temperate	☐
	C8	Irrigated crops (other) : Boreal and /or highlands	☐
	C9	Rainfed crops : Tropics	☐
	C10	Rainfed crops : Subtropics	☐
	C11	Rainfed crops : Temperate	☒
	C12	Rainfed crops : Boreal and /or highlands	☐
Mixed	M1	Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Tropics	☐
	M2	Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Subtropics	☐
	M3	Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	☒
	M4	Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Boreal and /or highlands	☐
Others [please specify]	O1		☐
Others [please specify]	O2		☐
Others [please specify]	O3		☐
Others [please specify]	O4		☐
Others [please specify]	O5		☐

5. Provide in Table 2 a description for each production system. Countries may wish to use the following criteria, where information is available:

Environmental features and characteristics:

a) additional information on climate (arid, semi-arid, humid, subhumid);
b) features of the landscape mosaic.

Rural livelihoods and sustainable use:

c) share of smallholders;
d) proportion of the production system found in urban or peri-urban context;
e) share of the population actively contributing to the production system disaggregated by gender, including number of employees if available;
f) importance of the production system to the incomes, livelihoods and well-being of rural communities;
g) levels of agricultural intensification and the reliance of synthetic inputs, modern varieties, fossil fuels, etc.

Table 2. Description or characterization of production systems within the country

Production system	**Description**

Livestock grassland-based systems: Temperate	In Belgium, there are 16,771 farms (43% of all Belgian farms) in Belgium, from which 4,645 are specialized in milk production, 8,034 specialized in beef production, 2,439 mixed grassland based cattle farms and 1,653 farms with other grazing stock (sheep, etc.). All together the farms have 2.5 million animals. These farms represent 21,257 man-work units (36% of all man-work units in the primary sector) (2012). Source: FPS Economy, ADSEI.
Livestock landless systems: Temperate	In Belgium, there are 3,810 farms specialized in pigs and/or poultry (10% of all Belgian farms). All together they have 6.6 million pigs, 12 million laying hens and 22.7 million broilers. These farms represent 10% of all man-work units in the primary sector (5,721 man-work units) (2012). Source: FPS Economy, ADSEI.
Naturally regenerated forests: Temperate	In Walloon forests, natural regeneration is the regeneration method generally used in deciduous forests, but it is also being progressively applied in some coniferous forests originally established through plantation of introduced species. Naturally regenerated forests cover 255,100 ha. Harvesting of natural forests amounts to 846,000 m^3 per year (average of the period 2003-2010). In Flanders, there are no naturally regenerated forests of economic importance.
Planted forests: Temperate	Flanders: The surface of forestry in Flanders amounted to 185,686 ha in 2013. Some 250,000 m^3 wood is sold through the formal channels (public wood sales, coordinated wood sales of plots of wood land). This offer consists for 2/3 of wood for industrial processing and for 1/3 of firewood. In addition to this, there is also the private sale to professional wood merchants, presumably amounting to the same volumes. These volumes are estimated at 200,000 m^3 yearly. Finally, there is also a major private trade into private firewood. This trade is estimated at over 500,000 m^3 every year (Vandekerkhove, et al., 2014). In Wallonia, planted forests cover 268,600 ha. Annual harvesting of planted forests amounts to 3,296,000 m^3 (average of the period 2003-2010). When planting these forests, the focus is on using advisable genetic provenances.

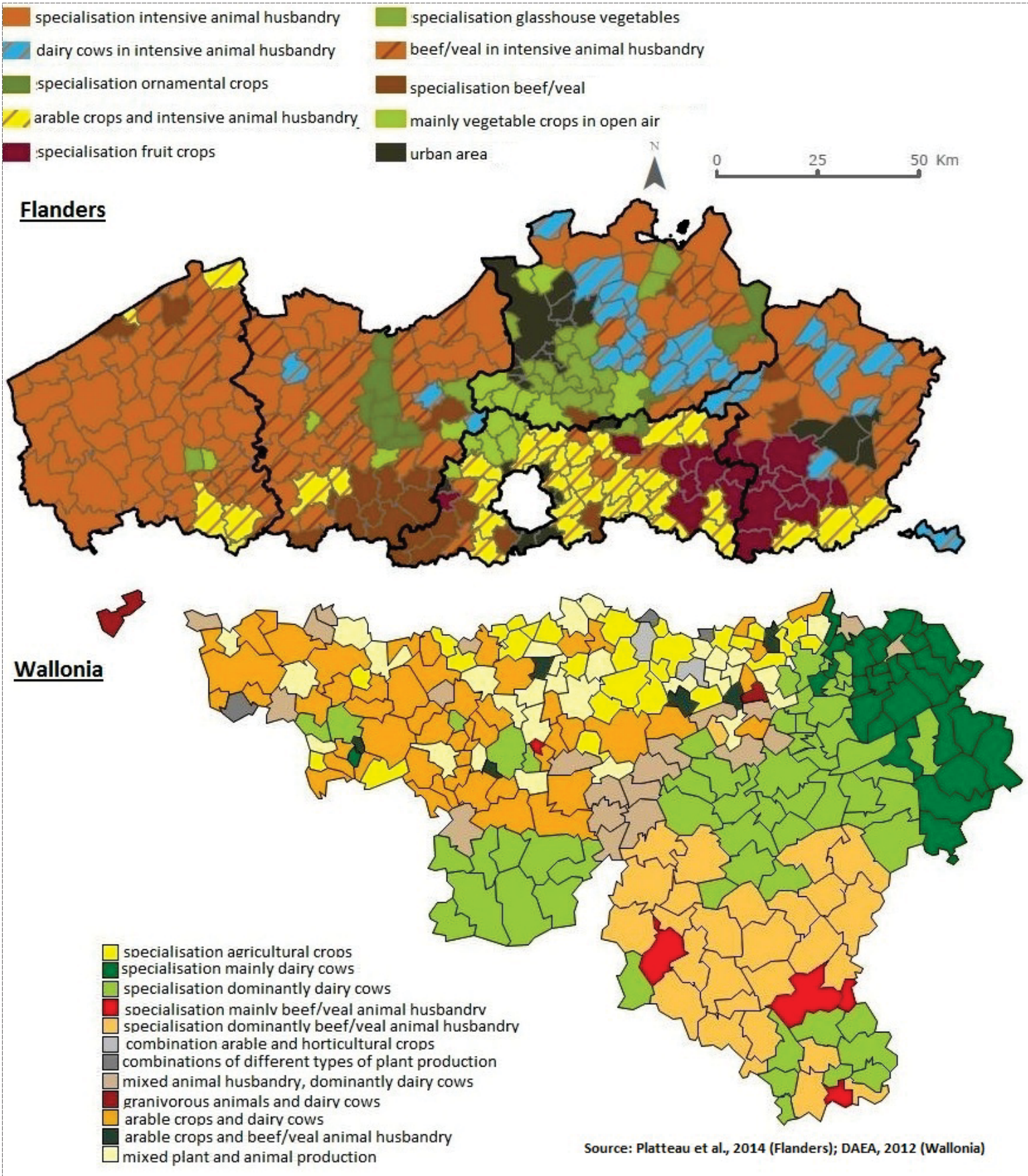
Self-recruiting capture fisheries: Temperate	Sea fisheries sector Development of the sector Over the past decades, the Belgian fisheries fleet has considerably diminished in number. In 1950, there were 457 vessels. End 2013, the fisheries fleet consisted of 80 commercial vessels with a global engine capacity of 46,525 kW and 14,645 BT tons: 37 vessels with an engine capacity larger than 221 kW and 43 vessels with an engine capacity up to 221 kW. 52 of the 80 vessels (65%) are older than 20 years. The average vessel is about 25 years old. Fishing quota In total, Belgium holds some sixty fish quotas which are centrally managed. A steady growth has been established in recent years (a rise in plaice and herring, a small decrease in sole in 2013, cod stabilizing at a low level). Economic features: landing and capture turnover In 1950, fishing catches realised by the Belgian vessels exceeded 50,000 tonnes, in 2013 they were about 22,793 tonnes. The massive increase in the volume of the catches by foreign ports is remarkable: from 20% up to 28%.The total capture turnover of the Flemish fishing industry amounted to 73.08 million euro in 2013. The decrease of the capture turnover is clearly the consequence of the decreasing number of active fishing vessels. This is an indication of the difficult situation the fishing industry is facing. Following species occur in the top 10 (figures 2013) of most caught species by the Belgian fishing industry: plaice (7,787 tonnes, 34%) and sole (2,768 tonnes, 12%), skate (6%), shrimp, cod, lemon sole, squid, tub gurnard, scallops and dab. Figures from Eurostat clearly show Belgium is a net importer of fishing products. Employment In 2012, the Belgian fishing industry had 439 recognised fishermen. In addition, some 1,040 people were working in the fish processing companies as well as 5,000 people in companies related to the fishing industry. (Source: Van Bogaert, et al., 2014) Freshwater fishing The surface of public freshwater in Flanders amounts to 25,700 ha. Only 10,280 ha are being fished. In 2011, over 63,000 fishing permits were granted, which is about half of the number 25 years ago. Approximately 45% of the freshwater fisher folk have a fishing permit for fishing in public waters in Flanders. In Wallonia, the situation is similar to that of Flanders, with 58,379 fishing permits sold in the Walloon region in 2014. Around 75% of these fishermen fish in rivers and lakes owned by the Walloon region, and the rest fish in rivers and lakes belonging to private owners. Both in Flanders and Wallonia, the Fisheries Fund controls the income from the sale of these fishing permits. The income is used for the implementation of the EU fisheries policy (e.g. release of young fish, funding fishermen's federations, fishing centres, fishing schools, various technical-scientific research programmes, etc.) and serves the public interest of public fishing. In Flanders, angling is also done in a large number of private stock ponds representing a surface of approximately 1,500 ha. A survey has indicated that 174.5 tonnes of fish are annually fished by recreative fisher folk in public ponds (on a total of 58.788 fisher folk in 2008). As many as 72% of all fisher folk claim they never take any fish home. 6.5% of all fisher folk do use small fish as bait fish for catching predatory fish. 21% of all fisher folk occasionally take some fish home for consumption. Perches and eel together represent 66% of the total catch in Flanders. Freshwater bream represents 7% of the total catch. Other species together amount to 27% of the catch and individually represent each 5% of the catch. Recreational fishing in Wallonia is practised in salmonid watercourses in either the trout zone (Aisne, Haute-Lesse, etc.) or the grayling zone (part of the Ourthe, the Amblève, etc.) (Huet zonation, 1949). The species fished in this part, upstream from the catchment areas, are mainly trout and European grayling. Further down in the catchment areas, more lentic watercourses can be found with barbel zones (lower Ourthe, Semois, etc.) and bream zones (Meuse, Sambre, canals, etc.). The species fished in these zones are mainly roach, rudd, bream, common carp, pike, zander, perch, catfish and cyprinids adapted to fast-flowing waters (barbel, chub, etc.). (Source: Meiresonne & Turkelboom, 2012)

Fed aquaculture: Temperate	The Belgian aquaculture production was estimated in 2011 at 50 tonnes and a global value of 218,480 euro. This production is mostly concentrated in the southern part of Belgium (Wallonia). It should be noted that this figure deals with food-related production. Total annual aquaculture production was estimated at 332 tonnes in 2013 with a market value of 4,450,000 euro This production is mainly used to stock fishing ponds and rivers. The Flemish aquaculture industry in 2013 featured rather open extensive ponds having a limited negative environment impact. The projects being developed at the moment are rather intensive Recycling Aquaculture Systems. In Wallonia, production is largely small-scale, semi-intensive, with a low environmental impact given the sector's small size. Employment in the Belgian primary aquaculture industry is estimated at 60 full-time equivalents (FTE). Supply companies represent 78 FTE in Flanders. (Source: Van Bogaert, et al., 2014)
Rainfed crops : Temperate	There are 8,021 farms specialized in arable farming (21% of all Belgian farms) and 2,270 farms with outdoor horticulture (vegetables, fruits and ornamental horticulture) in Belgium (6% of all Belgian farms). They represent respectively 7,884 and 7,218 man-work units, or 14% and 12% of all man-work units in the Belgian primary sector. The total area of arable crops is 502,487 ha. There is 38,001 ha outdoor vegetable growing, 17,999 ha outdoor fruit production, and 6,103 ha outdoor ornamental horticulture in Belgium (2012). Source: FPS Economy, ADSEI
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	In Belgium, there are 6,392 mixed farms (crop – livestock or agro-pastoralist) in Belgium, or 17% of all Belgian farms. They represent 17% of all man-work units in the Belgian primary sector (9,632 man-work units) (2012). Source: FPS Economy, ADSEI. Today, other types of mixed systems, like agroforestry – livestock and integrated aquaculture are now exceptional but growing.

6. Provide a map of production systems in your country, marking the places and regions mentioned in the Country Report.

Add

Delete



Click to upload map

7. For each production system found in your country (refer to Table 1), indicate in Table 3 the area under production (km^2, hectares, acres, other). If not applicable, indicate the estimated production quantity (major products aggregated) using the appropriate unit or measure (tonne, head, inventory, cubic metre, etc.) for the production system. If available, indicate the contribution of the production system to the agricultural sector economy in the country (%). Please use the most recent data available and indicate the year of reference for the data or estimates. Specify NK if not known or NA if not applicable.

Table 3. Area under production, production quantity and contribution to the agricultural sector economy of production systems in the country.

Production systems	Area		Production - quantity		Contribution to the agricultural sector economy	Reference year
	Value	Unit (enter)	Value	Unit (enter)	%	year
Livestock grassland-based systems: Temperate			Beef / veal: 238,65	tonnes	27	2012
Livestock landless systems: Temperate	NA		Pork: 1,138,394 to	tonnes	28	2012
Naturally regenerated forests: Temperate	255,100 (Wallo	ha	846,200 (Wallonia	m3/year	0	2003-2010
Planted forests: Temperate	268,600 (Wallo	ha	3,296,900 (Wallon	m3/year	0	2003-2010 (W
Self-recruiting capture fisheries: Temperate	Sea fisheries: 3		Sea fisheries: 22,7	tonnes		2013 (sea fish
Fed aquaculture: Temperate			50 (218,480 euro)	tonnes		2011
Rainfed crops : Temperate	564,590	ha	Cereals: 1,457,096	tonnes	45	2012
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	NK		NK		NK	

8. Comment on the effects on biodiversity for food and agriculture of production destined for exportation versus production for local and/or national consumption. Where information is available, indicate for each production system the proportion of production that is destined for export, the major commodities involved, the impact on the methods of production (e.g. adoption of specific production practices to meet export needs) and the implications for biodiversity.

Not specifically studied in Belgium.

CHAPTER 2: Drivers of change

Proposed structure of the chapter and information to be included in the Country Reports

This Chapter provides an assessment of the major drivers causing changes (drivers list and descriptions provided in Annex 3), either positive or negative, on the state of biodiversity for food and agriculture in the country, with specific attention to changes in the associated biodiversity in and around production systems, ecosystem services and wild foods. This Chapter also encourages countries to compare drivers between different production systems.

The Chapter will address the following topics related to drivers of change in biodiversity for food and agriculture:

- The effects of drivers and stressors over the past ten years on a) associated biodiversity, b) ecosystem services and c) wild foods;
- Impacts of drivers on the involvement of women in the maintenance and use of biodiversity for food and agriculture, the application and preservation of traditional knowledge, and rural poverty alleviation;
- Countermeasures addressing current and emerging drivers, best practices and lessons learned.

The Country Report should include information or reference to any specific studies that have been carried out in the last ten or so years that relate observed changes in the extent or distribution of associated biodiversity and wild foods in the country to different drivers.

IMPORTANT: Throughout these guidelines, questions on production systems will refer to the production systems identified in Table 1 as present in your country.

One of the main objectives of this report is to identify knowledge gaps and to provide baseline information for future assessments. Thus please indicate where information is unavailable.

Effects of drivers of change on associated biodiversity

9. What have been the most important drivers affecting the extent and distribution of associated biodiversity in the last 10 years in your country? In describing the drivers you may wish to indicate the production systems where associated biodiversity is most affected and identify drivers that are common to the various components of associated biodiversity listed. Indicate where possible the indicators used to measure changes, along with the sources of information.

Changes in land use (including habitat loss, fragmentation and intensive land use) are an important driver for changes in biodiversity and associated ecosystems. Both urbanization and changes in land use play an important role. The conversion of grassland to arable land, the expansion and intensified land use put pressure on associated biodiversity.
Pollutants and nutrients are another major threat to biodiversity and ecosystems. An increase in nutrients caused by eutrophication threatens the water quality in Flanders. Pesticides also cause damage. In recent years, pressure on the marine life has declined.
Overexploitation of groundwater creates drought in many ecosystems having negative consequences for biodiversity.
Desiccation is a problem that occurs more often in Flanders.
The policy public authorities implement, also has a significant (mostly positive) influence on the associated biodiversity for food and agriculture.

10. Where associated biodiversity is believed to be affected by climate change, please provide additional information on the nature, severity and frequency of the climate threat and the production systems impacted.

New diseases, fungi and insects, salinization due to desiccation, being the result of a changing climate, threaten the biodiversity of fields (production systems C11 and M3). Climate change can furthermore lead to a higher frequency of intense showers leading to a higher erosion risk (Demolder et al., 2014).
Recent climate changes for instance have already affected the dispersion patters of pollinators, such as butterflies and bumblebees. Depending on the climate conditions, plants will also flower earlier or later than average. If flowering plants and

their pollinators respond differently, they might decouple, both in space and time. This can result in a narrowing of the host plant's availability (less food opportunities) and the vanishing of the pollinator (as well as of the host plant). Recent heat waves in Europe have said to be a likely explanation for the strong (local) decrease of the bumblebee population. Climate changes can also stimulate the dispersion of pathogens and/or predators of pollinators (De Bruyn, 2014a).
As a result of the higher temperatures, other diseases occur more often. Certain insects common to glasshouse cultivation now also survive outside the glasshouse. One example of this is the western flower thrips (Frankliniella occidentalis), which is able to survive and propagate outside the glasshouse in summer. Other organisms, being already present, become more aggressive when temperatures rise or suddenly cause damage. Another example of this is the European corn borer (Ostrinia nubilalis) (D'Haene et al, 2010).
Little research has been done on the impact of climate change on the biodiversity of meadows (production system L3) and brushwood in Flanders. Due to the temperature rise, the growing season of plants is prolonged and the rise in CO2 results in a fertilizing effect.
The current climate change has already altered the tree layer and bush layer of Belgian forests (production systems F3 and F7) (De Frenne et al, 2011). Moreover, a new Belgian research project 'FORBIO Climate' (2014-2018) has just started. 'FORBIO Climate' wants to scrutinize the adaptive capacity of tree species and predict the future performance of tree species in Belgium under different scenarios of climate change. The project will focus on oak (Quercus robur/petraea) and beech (Fagus sylvatica), two tree species with a high ecological and economic significance in Belgium (and Europe).
(Source: http://www.biw.kuleuven.be/lbh/lbnl/forecoman/ned/projbeschrijving.asp?n=82).
A new INBO (Instituut voor Natuur- en Bosonderzoek - Research Institute for Nature and Forest) natural indicator, 'leaf development oak and beech', confirms the impact of climate change on biodiversity: oaks and beeches flower earlier when spring is warm than they do when spring is colder. In the last ten years, several spring seasons were exceptionally warm (2007, 2009, 2011 and 2014 were four out of the five warmest spring seasons ever; http://www.natuurrapport.be/natuurindicatoren-2014).

Effects of drivers of change on biodiversity for food and agriculture

This section applies to all biodiversity for food and agriculture. Countries that previously presented or are currently preparing a Country Report on Forest, Aquatic, Animal or Plant Genetic Resources, may wish to use these reports as reference.

11. For each production system present in your country as indicated in Table 1, fill in the code and name of each production system in Table 4 (repeat Table for each production system). For each production system indicate which drivers have been influencing biodiversity for food and agriculture, disaggregated by sector, during the past 10 years (description of drivers can be found in Annex 3). Drivers may have a strongly positive (2), positive (1), negative (-1), and strongly negative effect (-2), or no effect at all (0) on biodiversity for food and agriculture. If the effect of the driver is unknown or not applicable, please indicate not known (NK) or not applicable (NA).

Table 4. Effect of drivers on sector biodiversity within production systems in the country, by animal (AnGR), plant (PGR), aquatic (AqGR) and forest (FGR) genetic resources.

Production systems	**Drivers**	**Effect of drivers on sector biodiversity for food and agriculture** (2, 1, 0,-1, -2, NK, NA)			
	(Place pointer on the driver name for a detailed description)	PGR	FGR	AnGR	AqGR
Livestock grassland-based systems: Temperate	Changes in land and water use and management	-1	NA	NK	NA
	Pollution and external inputs	-1	NA	NK	NA
	Over-exploitation and overharvesting	NK	NA	NK	NA
	Climate change	NK	NA	NK	NA
	Natural disasters	NK	NA	NK	NA
	Pests, diseases, alien invasive species	NA	NA	NK	NA
	Markets, trade and the private sector	NK	NA	NK	NA
	Policies	NK	NA	+1	NA
	Population growth and urbanization	NK	NA	NK	NA

	Changing economic, socio-political, and cultural factors	NK	NA	NK	NA
	Advancements and innovations in science and technology	NK	NA	NK	NA
	Other [*please specify*]:	NA	NA	NA	NA
Livestock landless systems: Temperate	Changes in land and water use and management	-1	NA	NK	NA
	Pollution and external inputs	-1	NA	NK	NA
	Over-exploitation and overharvesting	NK	NA	NK	NA
	Climate change	NK	NA	NK	NA
	Natural disasters	NK	NA	NK	NA
	Pests, diseases, alien invasive species	NA	NA	NK	NA
	Markets, trade and the private sector	NK	NA	NK	NA
	Policies	NK	NA	+1	NA
	Population growth and urbanization	NK	NA	NK	NA
	Changing economic, socio-political, and cultural factors	NK	NA	NK	NA
	Advancements and innovations in science and technology	NK	NA	NK	NA
	Other [*please specify*]:	NA	NA	NA	NA
Naturally regenerated forests: Temperate	Changes in land and water use and management	NA	+1 ; multi-	NA	NA
	Pollution and external inputs	NA	NK	NA	NA
	Over-exploitation and overharvesting	NA	0 (loggin	NA	NA
	Climate change	NA	NK	NA	NA
	Natural disasters	NA	NK but p	NA	NA
	Pests, diseases, alien invasive species	NA	-1 Walloni	NA	NA
	Markets, trade and the private sector	NA	-1	NA	NA
	Policies	NA	+1 (conv	NA	NA
	Population growth and urbanization	NA	-1 defor	NA	NA
	Changing economic, socio-political, and cultural factors	NA	NK	NA	NA
	Advancements and innovations in science and technology	NA	+1 if impr	NA	NA
	Other [*please specify*]:	NA	NA	NA	NA
Planted forests: Temperate	Changes in land and water use and management	NA	+1 ; multi-	NA	NA
	Pollution and external inputs	NA	NK	NA	NA
	Over-exploitation and overharvesting	NA	0 (loggin	NA	NA
	Climate change	NA	NK	NA	NA
	Natural disasters	NA	NK but p	NA	NA

	Pests, diseases, alien invasive species	NA	-1 Walloni	NA	NA
	Markets, trade and the private sector	NA	-1	NA	NA
	Policies	NA	+1 (conve	NA	NA
	Population growth and urbanization	NA	-1 defores	NA	NA
	Changing economic, socio-political, and cultural factors	NA	NK	NA	NA
	Advancements and innovations in science and technology	NA	+1 if impr	NA	NA
	Other [*please specify*]:	NA	NA	NA	NA
Self-recruiting capture fisheries: Temperate	Changes in land and water use and management	NA	NA	NA	-1 (Lan
	Pollution and external inputs	NA	NA	NA	-1 (Pol
	Over-exploitation and overharvesting	NA	NA	NA	-2 (ov
	Climate change	NA	NA	NA	NK
	Natural disasters	NA	NA	NA	NK
	Pests, diseases, alien invasive species	NA	NA	NA	-1 (alie
	Markets, trade and the private sector	NA	NA	NA	-1 (som
	Policies	NA	NA	NA	+1: CAI
	Population growth and urbanization	NA	NA	NA	-2 prot
	Changing economic, socio-political, and cultural factors	NA	NA	NA	NK
	Advancements and innovations in science and technology	NA	NA	NA	+2
	Other [*please specify*]:	NA	NA	NA	+1 (mo
Fed aquaculture: Temperate	Changes in land and water use and management	NA	NA	NA	-1 (Lan
	Pollution and external inputs	NA	NA	NA	-1 (Pol
	Over-exploitation and overharvesting	NA	NA	NA	-2 (ov
	Climate change	NA	NA	NA	NK
	Natural disasters	NA	NA	NA	NK
	Pests, diseases, alien invasive species	NA	NA	NA	-1 (alie
	Markets, trade and the private sector	NA	NA	NA	-1 (som
	Policies	NA	NA	NA	+1: CAI
	Population growth and urbanization	NA	NA	NA	-2 prot
	Changing economic, socio-political, and cultural factors	NA	NA	NA	NK
	Advancements and innovations in science and technology	NA	NA	NA	+2
	Other [*please specify*]:	NA	NA	NA	+1 (mo
Rainfed crops : Temperate	Changes in land and water use and management	-1	NA	NA	NA

	Pollution and external inputs	-1	NA	NA	NA
	Over-exploitation and overharvesting	NK	NA	NA	NA
	Climate change	NK	NA	NA	NA
	Natural disasters	NK	NA	NA	NA
	Pests, diseases, alien invasive species	NK	NA	NA	NA
	Markets, trade and the private sector	NK	NA	NA	NA
	Policies	+1	NA	NA	NA
	Population growth and urbanization	NK	NA	NA	NA
	Changing economic, socio-political, and cultural factors	NK	NA	NA	NA
	Advancements and innovations in science and technology	NK	NA	NA	NA
	Other [*please specify*]:	NA	NA	NA	NA
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	Changes in land and water use and management	-1	NA	NK	NA
	Pollution and external inputs	-1	NA	NK	NA
	Over-exploitation and overharvesting	NK	NA	NK	NA
	Climate change	NK	NA	NK	NA
	Natural disasters	NK	NA	NK	NA
	Pests, diseases, alien invasive species	NA	NA	NK	NA
	Markets, trade and the private sector	NK	NA	NK	NA
	Policies	NK	NA	+1	NA
	Population growth and urbanization	NK	NA	NK	NA
	Changing economic, socio-political, and cultural factors	NK	NA	NK	NA
	Advancements and innovations in science and technology	NK	NA	NK	NA
	Other [*please specify*]:	NA	NA	NA	NA

Effects of drivers of change on associated biodiversity

12. What have been the main drivers affecting regulating and supporting ecosystem services in the country during the last 10 years? Describe, for each production system, the major driver(s) affecting ecosystem services and indicate the effect on ecosystem services as being strongly positive (2), positive (1), negative (-), strongly negative (-2), no effect (0), not known (NK), or not applicable (NA) in Table 5 (repeat table for each production system). Place pointer on the ecosystem service name for a detailed description.

Table 5. Major drivers and their effect on ecosystem services in production systems.

Production systems	**Drivers**	**Effect of drivers on ecosystem services** (2, 1, 0,-1, -2, NK, NA) (Place pointer on the ecosystem service name for a detailed description)

	(Place pointer on the driver name for a detailed description)	Pollination	Pest and disease regulation	Water purification and waste treatment	Natural hazard regulation	Nutrient cycling	Soil formation and protection	Water cycling	Habitat provisioning	Production of oxygen/ Gas regulation
Livestock grassland-based systems: Temperate	Changes in land and water use and management	NA	-1	-1					-1	
	Pollution and external inputs	NA	-1	-1		-1	-1		-1	
	Over-exploitation and overharvesting	NA					-1	-1	-1	
	Climate change	NA					(+1)/-1			
	Natural disasters	NA					NK			
	Pests, diseases, alien invasive species	NA								
	Markets, trade and the private sector	NA					-1			
	Policies	NA		+1		+1	+1	+1	+1	
	Population growth and urbanization	NA		-1			-1			
	Changing economic, socio-political, and cultural factors	NA		+1			+1/-1			
	Advancements and innovations in science and technology	NA					+1/-1			
	Other [*please specify*]:	NA								
Livestock landless systems: Temperate	Changes in land and water use and management	NA					NA			
	Pollution and external inputs	NA		-1		-1	NA			
	Over-exploitation and overharvesting	NA					NA			
	Climate change	NA					NA			
	Natural disasters	NA					NA			
	Pests, diseases, alien invasive species	NA					NA			
	Markets, trade and the private sector	NA					NA			
	Policies	NA		+1			NA	+1		
	Population growth and urbanization	NA		-1			NA			
	Changing economic, socio-political, and cultural factors	NA		+1			NA			
	Advancements and innovations in science and technology	NA					NA			
	Other [*please specify*]:	NA					NA			
Naturally regenerated forests: Temperate	Changes in land and water use and management	-1	1	1	1	0	-1	1	0	-1

	Pollution and external inputs	NK	NK	-1	NK	-1	NA	-1	-1	-1
	Over-exploitation and overharvesting	-1	-1	0	-2	0	0	0	0	0
	Climate change	NK	0	0	-2	0	0	-1	0	-1
	Natural disasters	-1	1	-1	-2	-1	NK	-1	0	-1
	Pests, diseases, alien invasive species	-1	-2	-1	NA	-1	NK	NK	-1	NK
	Markets, trade and the private sector	NK	-1	-1	-1	NK	NK	-1	-1	1
	Policies	2	1	1	1	1	+1/-1	+1	+1	1
	Population growth and urbanization	-1	-1	-1	-1	-1	-1	-1	-1	-2
	Changing economic, socio-political, and cultural factors	0	0	0	-1	0	+1/-1	0	0	0
	Advancements and innovations in science and technology	0	1	1	1	1	+1/-1	1	1	1
	Other [*please specify*]:	NA	NA	NA	NA	NA	NA	NA	NA	NA
Planted forests: Temperate	Changes in land and water use and management	-1	1	1	1	0	-1	1	0	-1
	Pollution and external inputs	NK	NK	-1	NK	-1	NA	-1	-1	-1
	Over-exploitation and overharvesting	-1	-1	0	-2	0	0	0	0	0
	Climate change	NK	0	0	-2	0	0	-1	0	-1
	Natural disasters	-1	1	-1	-2	-1	NK	-1	0	-1
	Pests, diseases, alien invasive species	-1	-2	-1	NA	-1	NK	NK	-1	NK
	Markets, trade and the private sector	NK	-1	-1	-1	NK	NK	-1	-1	1
	Policies	2	1	1	1	1	+1/-1	+1	+1	1
	Population growth and urbanization	-1	-1	-1	-1	-1	-1	-1	-1	_2
	Changing economic, socio-political, and cultural factors	0	0	0	-1	0	+1/-1	0	0	0
	Advancements and innovations in science and technology	0	1	1	1	1	+1/-1	0	0	0
	Other [*please specify*]:	NA	NA	NA	NA	NA	NA	NA	NA	NA
Self-recruiting capture fisheries: Temperate	Changes in land and water use and management	NA	NA	NA			NA			
	Pollution and external inputs	NA	NA	NA			NA			-2
	Over-exploitation and overharvesting	NA	NA	NA			NA			
	Climate change	NA	NA	NA			NA			-1
	Natural disasters	NA	NA	NA			NA			-1
	Pests, diseases, alien invasive species	NA	NA	NA			NA			-2
	Markets, trade and the private sector	NA	NA	NA			NA			
	Policies	NA	NA	NA			NA			
	Population growth and urbanization	NA	NA	NA			NA			-1

	Changing economic, socio-political, and cultural factors	NA	NA	NA			NA			
	Advancements and innovations in science and technology	NA	NA	NA			NA			
	Other [*please specify*]:	NA	NA	NA			NA			
Fed aquaculture: Temperate	Changes in land and water use and management	NA					NA			
	Pollution and external inputs	NA					NA			-2
	Over-exploitation and overharvesting	NA					NA			
	Climate change	NA					NA			-1
	Natural disasters	NA					NA			-1
	Pests, diseases, alien invasive species	NA					NA			
	Markets, trade and the private sector	NA					NA			
	Policies	NA					NA			+1
	Population growth and urbanization	NA					NA			
	Changing economic, socio-political, and cultural factors	NA					NA			
	Advancements and innovations in science and technology	NA					NA			
	Other [*please specify*]:	NA					NA			
Rainfed crops : Temperate	Changes in land and water use and management	-1	-1	-1			-1	-1	-1	
	Pollution and external inputs	-1	-1	-1		-1	-1		-1	
	Over-exploitation and overharvesting						-1	-1	-1	
	Climate change	NK	NK				(+1) /-			
	Natural disasters						NK			
	Pests, diseases, alien invasive species	NK								
	Markets, trade and the private sector						-1			
	Policies	-1/+1	NK	+1		+1	+1	+1	+1	
	Population growth and urbanization			-1			-1			
	Changing economic, socio-political, and cultural factors		NK	+1			+1/-1			
	Advancements and innovations in science and technology						+1/-1			
	Other [*please specify*]:									
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	Changes in land and water use and management									
	Pollution and external inputs									
	Over-exploitation and overharvesting									
	Climate change									

	Natural disasters									
	Pests, diseases, alien invasive species									
	Markets, trade and the private sector									
	Policies									
	Population growth and urbanization									
	Changing economic, socio-political, and cultural factors									
	Advancements and innovations in science and technology									
	Other [*please specify*]:									

13. Briefly describe the main driver(s) affecting ecosystem services in each production system, as identified in Table 5. Include where possible a description of the components of associated biodiversity that are affected, the indicators used to measure change, and the source of information.

The main drivers for the ecosystem service `Pollination':

Change in land use A more intensified agriculture leads to larger agricultural parcels, a lower crop and herb diversity as well as the loss and fragmentation of (semi)-natural systems such as (old) grasslands, bushes, forest and small landscape elements. Habitat loss as a result of human intervention is generally considered to be the main cause of decline in pollinators on a global scale (De Bruyn, 2014a).

Use of pesticides: A more intensified agriculture leads to an increase in the use of chemical substances. This affects the quality of the pollinator's habitat but also has a direct and an indirect effect on the pollinators themselves (De Bruyn, 2014a).

Nevertheless, the use of pesticides has decreased in recent years, just like the pressure of pesticides on most environmental compartments. The pressure on aquatic life (measured in seq) in Flanders has dropped by 50% between 1990 and 2005 (http://www.milieurapport.be/nl/feitencijfers/milieuthemas/verspreiding-van-pesticiden).

Policies: The steady decrease in the number of hobby-beekeepers, being very important for the beekeeping activity, is a main cause of the decline in pollinating insects in Flanders. Beekeeping has become a less attractive hobby due to the increasing administrative formalities (food security), more severe regulations concerning private sale of honey and the regulations on urban planning dealing with the development of hives (D'Haene et al, 2010). On the other hand, a large number of policy actions have been taken in Belgium to fight against bee mortality and to stimulate pollination e.g. by distributing flower blends and by limiting the use of pesticides (see further).

The main drivers for the ecosystem service Soil formation and protection (D'Haene et al. (2010), Cools & Van Gossum (2014)):

(the rest of the answer to question 13 is found in the text field of question 15 because of restricted number of character in this text field.)

Effects of drivers of change on wild foods

14. What were the main drivers affecting the availability, knowledge and diversity of wild foods during the last ten years in the country? In Table 6, indicate the major drivers affecting availability, knowledge and diversity of wild foods, and if the effects are strongly positive (2), positive (1), negative (-1), strongly negative (-2), no effect (0), not known (NK), or not applicable (NA).

Table 6. Drivers affecting availability, knowledge and diversity of wild foods.

Drivers	**Effect of drivers** (2, 1, 0,-1, -2, NK, NA)

Drivers	Effect of drivers (2, 1, 0,-1, -2, NK, NA)		
(Place pointer on the driver name for a detailed description)	Availability of wild foods	Knowledge of wild foods	Diversity of wild food
Changes in land and water use and management	-1	NK	NK
Pollution and external inputs	-1 (sea fisheries: po	NK	NK
Over-exploitation and overharvesting	NK (hunt) -1 (overf	NK	NK
Climate change	NK	NK	NK
Natural disasters	NK	NK	+1 (possibility for d
Pests, diseases, alien invasive species	(+1)/-1	NK	NK
Markets, trade and the private sector	NK	NK	NK
Policies	+1	NK	+1 (dependent on t
Population growth and urbanization	-1	NK	NK
Changing economic, socio-political, and cultural factors	NK	NK	NK
Advancements and innovations in science and technology	+1/-1	NK	NK
Other [*please specify*]:	NA	NA	NA

15. Briefly describe the main drivers affecting the availability, diversity and knowledge of wild foods in your country, as identified in Table 6. Include where possible indicators used to measure change, along with the source of information.

The first part is this anwer belongs to question No. 13:

The main drivers for the ecosystem service Soil formation and protection (D'Haene et al. (2010), Cools & Van Gossum (2014)):

Demography:
In a densely populated region like Flanders, various sectors claim more soil. The demands made are also increasing as a result of demographic growth. This creates pressure on the scarcely undeveloped (open) space and causes important soil functions and soil services to disappear. Urbanization leads to an increasing soil compaction. The soil compaction in Flanders amounts to 12.9% (175 967 ha). This makes Flanders the region with the highest soil compaction in Europe.

Changes in land and water use and management:
The Flemish agricultural sector has been intensified on a large scale over the last decades. Agricultural intensification has many aspects. On the one hand there is the increase in the frequency of crops (thus the elimination of set-aside land). In addition, there is the increasing monoculture and the loss of crop rotation. Intensification leads to a decrease in organic matter in the soil and biomass but also to a decrease in diversity of most soil biota. In Flanders, the excessive use of both inorganic and organic fertilizers has led to nitrogen saturation of soil and nitrate leaching into drinking water. The expansion of agriculture also led to increased erosion and therefore a loss of soil fertility. In addition, the use of larger and heavier agricultural implements also leads to an increased soil compaction. Moreover, the reduction of the grassland area and the increase in the acreage of arable land by conversion of permanent grassland into temporary grassland and farmland has caused a decrease in the organic carbon stocks and organic matter.
To realise a fundamental change in these negative impacts, practices, often supported by the public authorities, have an entirely positive impact, such as crop rotation, green cover, the adding of compost or non-reduced tillage. An overview:

Agricultural and environmental policies:
Since 2015 the basic payment is supplemented with the greening premium, which is an important element of the direct payment system (First Pillar of the Common Agricultural Policy). The farmer receives the greening premium if he applies three farming practices which are beneficial to the climate and environment: crop diversification, conservation area of permanent pasture, ecological focus area ... An adequate crop rotation contributes to a healthy soil. Alternating different crops prevents the soil to become exhausted and ensures that pathogens and nematodes can be kept under control (see also pest and disease regulation). Because of the carbon stored in the soil, the conservation of the area of permanent pasture is important in the fight

against climate change. Some permanent pasture plots however are quite sensitive due to the fauna and flora present and should therefore be protected. Ecological focus areas will help to preserve and enhance biodiversity in the rural environment. There are different types of ecological focus areas: fallow land, buffer strips along water courses, wooded farmland, green cover, hedgerows, etc.
The payment of direct aid (first pillar CAP) is linked with the compliance of the framework conditions. The conditions are divided into three groups of measures: management requirements arising from 13 European directives and regulations relating to public health, animal health, plant health, environment (including soil erosion) and animal welfare. The minimum standards regarding soil erosion, organic substances in the soil, soil structure and minimum maintenance, water protection and water management aim at keeping the farmland soil in good condition. Therefore, there is also the obligation to maintain the total area "permanent pasture" in Flanders. (https://landvis.be/sites/default/files/attachments/brochure_randvoorwaarden2015.pdf)(https://landvis.be/sites/default/files/attachments/brochure_randvoorwaarden2015.pdf)
Examples of these management requirements are the provision of sufficient storage capacity for livestock manure and the emission-free use of manure (nitrates directive), the provision of buffer strips along water courses, etc.
The standards for good agricultural and environmental condition (GAEC) of land deal with water, soil, carbon stock, biodiversity, landscape and minimal maintenance. For these standards, regional interpretation is foreseen by a decision of the Flemish government. These are measures which have proved to be useful, which contribute to good agricultural practice and should be verifiable. In the context of the erosion, farmers are required to take measures on plots extremely or highly susceptible to erosion. In addition to measures dealing with proper land management, the farmer must also ensure a minimum soil cover depending on the crop.
The maintenance of permanent pasture has been part of the EU cross-compliance since 2005. The greening payment has been introduced by the new Common Agricultural Policy (CAP) which came into force on the 1st of January 2015. The maintenance of permanent pasture is one of the measures farmers are required to implement in order to obtain green payment.
Grants for erosion control plans are available at town or commune level.
In addition to direct aid and the agricultural practices defined in the Common Agricultural Policy, agro-environmental measures of Rural Development Plan II (RPD II) and RDP III also provide an extra compensation for those agricultural businesses achieving more than the minimum standards. The agro-environment measures allow an intervention for improving soil biodiversity and reducing soil erosion and pollution.
The incentives, both coming form EU and regional policy actions and subsidies, given with a view to increase the share of organic farming also contribute to good soil fertility.
In application of the European nitrates directive, Flanders has implemented its Fourth Action Plan during the 2011-2014 period. The draft version of the Fifth Action Plan (at time of writing in the public inquiry phase) sets out ambitious targets for a more rapid improvement of water quality. Flanders will therefore use a more area-specific approach and will impose more stringent measures for areas characterised by an insufficient water quality. An integrated business approach to fertilization will be the key element of the 5th Action Plan and will ensure more efficient use of fertilizers. In order to improve the soil condition, Flanders will promote the supplementation of organic material without exceeding the buffer capacity for nitrogen and phosphorus.

Pollutants and nutrients:
Soil acidification is partly a natural process. Natural or internal soil acidification occurs when there is a precipitation surplus. The acidification degree will depend on the buffering capacity of the soil (clay, loam, sand) and on the depth of the vegetation rooting. In Wallonia, half the soil pHKCl values recorded for cropland over the last ten years are under the threshold value of 6.5. The values recorded in the various agricultural regions decrease from north to south and from west to east. Since 1970, an improvement has been noted in the acid-base status of the soil in most agricultural regions. This may be related to the development of major industrial crops (like sugar beet), which are demanding from a pH point of view and for which the practice of liming has been more intensive.
A major cause of the loss of organic matter in agricultural soils is the reduced use of animal manure and the replacement of animal manure by slurry. Very often mineral fertilizers are applied. These provide nutrients but no organic matter. In addition, organic fertilizers are often used in liquid form as slurry. Liquid manure contains less solid matter than solid animal manure and is therefore not or little suitable to maintain the organic matter content of the soils.
Concerning soil pollution, various studies have found a loss in biodiversity related to the toxicity of metallic trace elements (MTE) or organic micropollutants for bacteria, earthworms, nematodes, Collembola, and Acari. These effects mean some soil organisms can be used as bioindicators, or for ecotoxicity testing. Some specialised microorganisms are however capable of breaking down organic pollutants and can thus be used or function naturally as pollution control agents (http://etat.environnement.wallonie.be/index.php?mact=rapportanalytique,mc7155,default,1&mc7155what=fiches&mc7155alias=La-fertilite-et-la-biodiversite-dans-les-sols&mc7155returnid=17&page=1).

The main drivers for the ecosystem service Nutrient Cycling (Cools & Van Gossum, 2014):

External inputs:
The most important nutrients involved in eutrophication are nitrogen and phosphorus. These elements are naturally present in the soil, but human activities create a very large additional supply to the environment. The two main sources are the fertilization of the (agricultural) soil with manure and mineral fertilizers and the emission of gaseous nitrogen compounds from industrial processes, combustion processes, livestock production and transportation.

Up to twenty years ago, the supply of sulphur via deposition (from anthropogenic emissions) was an important source for crops. In recent years, this deposition has fallen sharply. Sulphur is an essential nutrient for crops and now needs to be added, especially on grasslands where sulphur deficiency has led to an inferior grass quality.

Agricultural and environmental policies:
Flanders has implemented the EU conservation targets (Natura 2000) on the grounds of an appropriate assessment, for activities subject to a prior permit. Activities that might cause considerable damage to a special protection area are not entitled for a permit, unless the negative effects are reduced. This obligation has been part of the European legislation since 1992 and of Flemish regulations since 2002. Permits for farms in the neighbourhood of a special protection area may be subject to additional special conditions to reduce the negative impact. To avoid a general permit stop, Flanders developed a programmatic approach regarding nitrogen.
Other policies have an impact too on the ecosystem service nutrient cycling, including the fertilisation policy, cross-compliance, greening etc. (see above).

The main drivers for the ecosystem service Water purification and water cycling (Vrebos et al, 2014):

Demographic trends have an obvious impact the growing population, combined with an increasing consumption, has a major impact on food production (farming, industrial agriculture) and the input of nutrients in the system affecting the quality and quantity of ground water and surface water (see above).
Cultural aspects, such as the demand for organic products and ecological consumption, along with socio-political measures, such as grants and restrictions, can also have a positive effect on the market.
Society's need for sufficient water of good quality is translated into a number of legal standards. Science plays an essential role when defining these standards. Grants are an essential instrument the Flemish public authorities can use. Public authorities can play a more active role in the supply and demand for ecosystem services by creating new regulations or amending existing regulations. Grants can encourage both reductions in nutrient exemption (e.g. reduced use pesticides and fertilizers in horticulture) or stimulate the construction or maintenance of certain ecosystems or soil conditions able to remove nutrients (e.g. support for green cover) or denitrification.

Policy: The action program which is now being implemented in the framework of the nitrates directive focuses on the improvement of the water quality in the field of nitrates and phosphates (see above). The Flemish Government also focuses on the protection of human health and the environment through the "Sustainable Use of Pesticides" decree. In addition, the decree also focuses on sustainable water supply in Flanders. Therefore, the ban on the use of pesticides in groundwater extraction areas has been enlarged to a 6-meter strip along rivers on the 1st of January 2015.
Anyone consuming water from a water company or consuming water gained by private water extraction or anyone discharging water, must pay a fee for the purification of waste water. A levy is also to be paid e.g. for pumping large quantities of ground water.

Land use and management: Due to the high supply of phosphorus from both animal and artificial fertilizers which has taken place for many years in the past, phosphate saturation has occurred. Because (especially in winter) the groundwater table is often shallower than 1 meter, the excess of phosphate sometimes rinses, leading to eutrophication of the ground water and thus resulting in a decrease in water quality (drinking water, recreational water and industrial water). In addition to phosphate losses through discharge to groundwater, mainly in flat areas, erosion is a major problem in sloping areas.

The main drivers for the ecosystem service Pest and Disease Regulation (D'Haene et al. (2010), De Bruyn (2014b) and Meiresonne & Turkelboom (2012)):

The main species which contribute to natural pest control are:
- flying species: long tailed wasps (Ichneumonoidea), syrphid flies (Syrphidae), stink flies (Chrysopidae), lady beetles (Coccinellidae), minute pirate bugs (Nabidae and Reduviidae) and birds (Aves)
- crawling species: ground beetles (Carabidae), spiders (Aranae), rove beetles (Staphylinidae), centipedes (Chilopoda), opiliones (Opiliones) and common earwigs (Dermaptera)

Change in land use: Agricultural intensification and the large scale of farming have resulted in an increase in monocultures leaving less space for natural habitats. The impact of pest species there tends to be larger and natural enemies are rare or even absent so that they cannot control the pest species.

External inputs: Pesticides can have a negative effect on non-target organisms (including the natural enemies of a certain pest which no longer succeed to keep the pest species population at a reasonable level). Plant protection products can cause adverse side effects due to their toxic effects on non-target organisms (mainly of plants, insects and marine life, but also birds and mammals) as a result of direct contact or food intake (e.g. treated or contaminated seeds), pollution of environmental compartments (soil and ground surface water), and/or accumulation in the food chain (bioaccumulation). But pesticides can also have negative effects on the natural enemies of pesticides, leading to direct mortality, and also have indirect effects on their movement, feeding behaviour or reproduction speed which reduces their effectiveness. Due to low damage thresholds, low

tolerance towards trade damage and (relatively) inexpensive chemicals, natural enemies stand little chance in agriculture. More selective herbicides are often used on grassland rich in dicotyledonous herbs (buttercup, clover, plantain, dandelion, daisy, …) to ensure that monocotyledonous grass would have fewer competitors. In combination with the use of more fertilizers, this caused a steady decrease a lot of grasslands. The use of herbicides is the most applied on arable land. In some case, non-selective herbicides are used killing all plants without any distinction.
The use of more selective substances which do not harm the antagonists continues to spread. Moreover, chemical pesticides are being used more rationally than before. It turned out that the total pressure on aquatic life in Flanders has fallen sharply between 1990 and 2005 due to the rational agricultural use of pesticides.

Land use and management: Many natural enemies need carbohydrates and proteins for their basal metabolism, growth and reproduction. When a crop provides them with little or no nutrients, natural enemies have to find nectar, pollen or other sugar sources outside the field. Such emigrants possibly do not return to the crop or will die sooner, for instance such as small Trichogramma aphidiphagous, hoverflies of gauze flies. The location where plants grow and their botanical composition are therefore important to the survival of populations of natural enemies. Crops providing nutrients can also support larger populations of natural enemies that are better and as a result more fertile. Large monocultures usually have a short flowering period or no flowering at all.

Climate change: Cold-blooded animals, such as insects, are very sensitive to temperature when it comes to their development and reproduction. In case host organisms respond differently to temperature changes than their natural enemies do, synchronization problems may occur. Further climate warming may result in a less efficient biological control.

Policies: There are a number of international and national / regional policy instruments allowing to facilitate the integration of functional agricultural biodiversity in agro-ecosystems. On a global scale, there is the "United Nations Convention on Biological Diversity." This includes a thematic program on agricultural biodiversity. The program focuses on 1) adaptive management techniques, 2) practices and policies, and 3) capacity building, awareness raising and 4) the promotion of responsible actions. One of the instruments of the European Common Agricultural Policy (CAP) aims to support rural development and to promote the sustainable use of the environment and of nature. In Flanders, agro-environment measures have been integrated in the Flemish rural development programme (RDP). From 2015 onwards, direct aid under the First Pillar of the CAP also provides in a greening component which leads to crop diversification, more/ maintenance of permanent pasture, and the realization of ecological focus areas. This may also increase the area of semi-natural habitats.
The concept of functional agricultural biodiversity also fits in with the EU targets to minimize the hazards and risks from pesticides to health and the environment (Directive 2009/128/EC). In 2010, the EU introduced more severe regulations regarding the surface treatment of (corn) seeds with neonicotinoids. The Flemish government also approved the Action Plan "sustainable use of pesticides for 2012-2017".
By the implementation of the decree "sustainable use of pesticides", the Flemish Government focuses on the protection of human health and the environment. The decree stipulates that the use of pesticides should be avoided wherever possible. The use of chemical substances is only allowed when alternative methods are not possible.
None of the above-listed European and Flemish agricultural measures directly aim to develop or maintain the ecosystem service pest control. They aim more at the general improvement of the environment or the enhancement of biodiversity (protection of certain farmland and meadow birds, botanical management, erosion control, small landscape elements, plot border management), leading to an increasing number of soil organisms, different invertebrates, birds and/or rodents, and indirectly increasing of natural enemies of pest species.

The main drivers for the ecosystem service Habitat provisioning (D'Haene et al. (2010)):

Land use and management: Plant selection. The increasing maize production has a major impact on agricultural biodiversity. In the arable farming industry, the shift of cereal crops and root crops to maize also caused a shift in grain weeds (from cornflower and corn cockle to variety of new, mostly non-native weeds that are adapted to maize crops (e.g. barnyard grass, millet, crabgrass)). The expansion of maize cultivation at the expense of cereal crops, root crops and grassland is also disadvantageous for numerous typical farmland birds such as skylarks, corn bunting and yellowhammer. In the breeding season, maize fields offer less nesting space (due to the dense and high position of the crop). After harvest and during the winter, mainly common bird species such as pigeons (including wood pigeon), corvids (black crow, chew) and exotic and wild geese (Canada goose , Egyptian goose) benefit from crop residues. Only these species can eat whole kernels or are powerful enough to break kernels with their beaks. The food supply for finches, buntings, skylarks and other songbirds, however, is very limited in these maize fields. The specialization in maize as feed corn furthermore provides monotonous landscapes where certain species can barely survive. The bird species being present have to find their food (either seeds or insects) in other crops, grass strips, or other extensive or less intensively cultivated areas nearby. The limited variation and the dominance of maize cause many species to have disappeared in such landscapes. (D'Haene et al, 2010).
A shift also occurred in the cereal production industry. The less productive spring grain has almost been entirely replaced by winter grain which is sown in autumn. This has led to far less grain stubble in winter and the absence of seed-bearing weeds in winter grain. The sowing of a green cover during winter for nitrogen fixation and erosion control, also contributed to less grain stubble field in winter (D'Haene et al, 2010). A green cover itself can also be a source of food for certain fauna and can also be used to promote other ecosystem services such as soil structure, water quality, etc.

Finally, an important shift also occurred in the grassland area. Permanent grasslands and haylands rich in herbs have been replaced by temporary grasslands that do not flower and that are ploughed annually and reseeded ("grass field"). The higher grass production by fertilizing ensures an early and frequent mowing and leaves no chance for grassland birds. Other grassland-nesting species such as skylark, partridge and crake have been particularly affected (due to low breeding success). But the population of typical seed eaters living in species-rich grasslands, such as garganey and linnet, is clearly diminishing. The current conditions have allowed stopping this evolution (D'Haene et al, 2010). Alternatively, fertilisation using manure will have a beneficial effect on soil life and provide more structure in the grassland and will allow grassland birds to find sufficient food during the breeding season.

Larger scale in agriculture: The main consequences of a large scale on agricultural biodiversity are a direct loss of habitat for many species which depend on the rural area, as well as the fragmentation and isolation of the agricultural area (connectivity). The elimination of field margins obviously has had some negative consequences on typical farmland flora and fauna. The elimination of ponds made water plants and shore plants, amphibians, water beetles and many other water-invertebrates disappear. Due to the removal of hedges and hedgerows, numerous bird species (e.g. little owl, stonechat, yellowhammer...) have now difficulty finding nesting places and numerous invertebrates lack shelter places.

Cultivation techniques: Today's cultivation techniques too can have a negative effect on agro-biodiversity. Some examples:
• crops are now sown in rows with a limited driving distance. This together with an intensive fertilization often leads to uniform and dense crops with few weeds and little spatial variation.
• an efficient seed cleaning allowing to mechanically sort out weed seeds, which is detrimental to the plant population in fields. Before, crop seed always contained quite some weed seed.
• a lot of agricultural activities have a negative impact on agricultural biodiversity. Modern agricultural machines allow us to plough deeper. As a result, many characteristic bulbous plants have disappeared. Typical examples include tiger lily, star-of-Bethlehem, grape- hyacinths and gagea.
• stubble cultivation directly following harvest (ploughing but also sowing of a green cover for instance) is a problem to many plant species. As a result of this, the stubble period is often reduced avoiding many plant species to develop. This is mainly the case for a lot of small farmland weeds such as parsley piert, round-leaved and sharp-leaved fluellen, common and hybrid venus's-looking glass, dwarf spurge and forking lackspur. As a result of new technologies, the stubble cultivation has become much shorter (e.g. by sowing a green cover).
• soil compaction also occurs due to the use of heavy farm machines. This makes a lot of dry- and warmth-loving species disappear in favour of wet-loving species.

Pesticides: The main effects of pesticides on agricultural biodiversity occur indirectly. Not the active substance itself, but the indirect effects on the food chain are often at the basis of the problem. The impact of pesticides on herbs and invertebrates namely reduces the availability of food for many species with potential negative effects on their survival and reproduction.

Use of fertilizers: An excessive use of fertilizers has a considerably negative impact on the environment and biodiversity, not only in agricultural ecosystems but also in (semi) natural ecosystems outside the agricultural sector. The manure problem in Flanders threatened biodiversity, but since a number of years the fertilization pressure is dropping again. The nitrogen and phosphorus surpluses in Flanders have strongly gone down since 1990. The characteristics of Walloon farms mean less excess manure is produced (there are fewer feedlot farms and so there is less need to export these waste products/materials). Inputs from this organic matter are regulated through the Sustainable Nitrogen Management Programme (PGDA).
The effects of eutrophication on fauna are mainly the result of changes in vegetation composition and structure as well as changes in the soil fauna. As far as changes in vegetation composition are concerned, the disappearance or degradation of food and host plants is the most important aspect. By changes we understand both changes in the litter layer as well as in the general structural variation in vegetation structure. These changes lead to shifts in species composition and ultimately lead to the extinction of species. Denser vegetation means less light. As a result, a lot of butterflies do no longer survive. The decline in invertebrates also has adverse effects on the survival of many young grassland birds.
The effects of fertiliser inputs depend on many factors (initial species richness, nature and frequency of inputs, crop type, etc.). Inputs may stimulate biological activity and increase biomass, but they generally lead to loss of biodiversity, common species tolerant of nitrogen taking the place of rarer nitrogen-sensitive species (analytical report on the state of the Walloon environment, 2006-2007).

Organic matter in the soil: The organic matter in the soil is very important to soil life. Numerous organisms, from microscopic organisms (bacteria and fungi) to larger insects and worms benefit from a high input of organic material. More organic matter in the soil means more food and habitat for soil fauna and therefore also more biodiversity. A rich soil fauna also affects the diversity of birds and mammals higher up the food chain feeding themselves with soil organisms. However, the evolution of the organic matter level in the Belgian arable land has deteriorated in recent decades. Since the nineties, a systematic decrease in the organic carbon stocks has been established. More than half of the arable land is too low in carbon and humus-rich land plots are becoming rare. More improvement was established for the 2008-2011 period. Future measurements will prove if it the current trend will break (Cools & Van Gossum, 2014).
More specifically, in Wallonia it has been noted that there is an increase of total organic carbon (TOC) content in the soil, increasing as you go from north-west to south-east Wallonia, thus reflecting tendencies relating to climate, topography and land

use. Around 70% of land used for crops has TOC content below 1.5% in the topsoil, whereas most land used for pasture and forest gives figures 3 to 5 times higher. The most deficient land is located in major crop areas, where the risk of erosion is highest. This land has also occasionally been showing very high TOC losses since 1960, but the situation seems to have stabilised in the last 15 years, except in silty areas where it continues to decline. A number of different actions can contribute to improving the organic status of land (recovery of farm fertilisers and exogenous organic matter, agri-environmental measures, zero tillage, etc.). Returning harvest residues to the land is also a key element, hardly compatible with their use for energy purposes
(http://etat.environnement.wallonie.be/index.php?mact=tbe,mdb1bf,default,1&mdb1bfalias=Matieres-organiques-dans-les-sols&mdb1bfreturnid=43&page=43).

Desiccation: The main causes of desiccation in the agricultural sector are:
• drainage (dewatering and accelerated drainage),
• groundwater extraction (e.g. for irrigation), and
• filling in of depressions and levelling of plots result in a higher natural soil leading to a factual desiccation.
Desiccation is one of the main causes for the decline of wet, groundwater-dependent grasslands, such as marsh marigold grasslands, silverweed grasslands and pastures with large foxtail. For this species, the flow and the quality of shallow groundwater and soil water are of the utmost importance. The required water levels and water quality for groundwater dependent grasslands are almost nowhere achieved in the agricultural area. As a result, well-developed grassland of these types can almost only be found in nature reserves.
The ideal breeding habitat for many grassland birds consists of wet, nutrient-rich grasslands in open landscapes. Desiccation is therefore a major cause for the decline of many grassland birds. Several meadow bird species require very wet and swampy grasslands to settle and to breed.

Policy:
The Common Agricultural Policy invests in creation of habitat, both by the greening premium of the First Pillar as by the rural development programme of the Second Pillar (e.g. agro-environmental measures).

Overexploitation: Overexploitation by tree felling is generally not possible in Flanders: an owner must have a logging concession for every tree he wants to log or it must be integrated in an approved forest management plan. The public authority delivering the logging concession (ANB) takes into account a number of criteria avoiding overexploitation and the degradation of forests.

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Answer to question No. 15:

The effects of the drivers on the knowledge and diversity of wild foods have not been studied in detail. More information is present on the availability of wild foods:

Game (Scheppers & Casaer, 2014)

Demographic drivers: An increase in population also means an increase in the demand for food. This will probably result in an increasing demand for game. The degree to which the demand for game will result in a more intensive use of ecosystem services in Flanders is not known, because game is also imported.

Economic drivers: Economic prosperity results in an increase of the available family budget. Given the higher cost of game versus farmed meat, an increase of game consumption can be expected. This would have a positive impact on the ecosystem service. Countryside recreation does not only affect ecosystem processes (e.g. nuisance to wildlife during the breeding season), but also stimulates the valuation of ecosystem services, both directly (e.g. interaction during the hunt) and indirectly (e.g. short hunting periods). It is not known to what extent the demand for game would have an influence on the use of the ecosystem service.

Socio-political drivers: regulations, especially the Hunting Act (Flemish regulation establishing the species considered to be wild species), the Hunting Opening Decision (during which period of the year the hunt is opened) and the Hunting Conditions Act (conditions that need to be met for hunting to continue, as well as the resources and methods that may be used for this purpose, trade conditions and the transport of game), have a direct impact on the extent to which ecosystem services can be converted into ecosystem benefits. Also, nature conservation legislation has an impact on the degree to which species can be hunted and the location where it can be done.

Belgian federal laws establish that night vision equipment and silencers, having proved to be useful when hunting wild boa

Effects of drivers of change on traditional knowledge, gender and rural livelihoods

In answering questions 16 to 18, describe the major drivers that have had an impact in the last 10 years and include where possible indicators used to measure change, and sources of information.

16. Which drivers have had the most significant effect on the involvement of women in the maintenance and use of biodiversity for food and agriculture?

Not relevant for nor studied in Belgium

17. Which drivers have had the most significant effect on the maintenance and use of traditional knowledge relating to biodiversity for food and agriculture?

Neither relevant for Belgium nor studied in Belgium.

18. Which drivers have had the most significant effect on the role of biodiversity for food and agriculture in improving food security and sustainability?

Food security = Does the person have the capacity to buy the food (quality and quantity) he/she needs to meet her/his dietary needs at any time?

The Global Food Security Index, produced by the Economist Intelligence Unit and commissioned by DuPont, considers the core issues food security to be affordability, availability, and quality. The index is a dynamic quantitative and qualitative benchmarking model, constructed from 28 unique indicators, that measures these drivers of food security across both developing and developed countries. Economic development has the largest impact on food security.

Affordability (such as food consumption as a share of household expenditure, proportion of population under the global poverty line, the presence of food safety net programmes and access to financing for farmers).

Availability (such as sufficiency of supply, public expenditure on agricultural research and development, infrastructure and political stability risk).

Food safety and quality (such as diet diversification, national nutrition plan or strategy and micronutrient availability)
For Belgium, food affordability improved driven by falling agricultural import tariffs and a decline in the share of household expenditure dedicated to food.

The score for availability has declined. This is because of lower public expenditures on agricultural research & development. This is a proxy for agricultural innovation and technology that increases market efficiency and access. Another indicator that has declined is the urban absorption capacity, which is a measure for a country's capacity to absorb the stresses placed by urbanization and still ensure food security. This indicator is also important for biodiversity as urbanization has an effect on land use and on deforestation.

Quality and safety has also declined because the indicator diet diversification (the share of non-starchy foods in total dietary energy consumption) has declined.

It could be concluded that the main drivers on the role of biodiversity for food and agriculture in improving food security and sustainability in Belgium are Policies and Changing economic, socio-political and cultural factors.
(Source: Global food security index 2014, The Economist Intelligence Unit)

Countermeasures addressing current and emerging drivers of change, best practices and lessons learned

19. Referring to the information provided in this Chapter, identify countermeasures planned or in place to reduce adverse consequences of drivers on a) associated biodiversity, b) ecosystem services and c) wild foods. Provide any expected outcomes, lessons learned and best practices.

a. Associated biodiversity

Agro-environment measures (rural development programme): creation and maintenance of field margins, landscape elements, reduced tillage, mechanical weed control, reduced pesticide use … are subsidized. These practices are supposed to have positive effects on associated biodiversity like insects (pollinators, natural enemies of pest species), birds, soil biodiversity, etc.

Public bodies (provinces, municipalities …) also promote the creation of flowering field margins and sowing flowers by distributing free flower seed mixtures, both to farmers and citizens.

Flanders and Wallonia subsidize agroforestry. Effects of agroforestry on associated biodiversity have not yet been assessed under Belgian circumstances, but have been relatively well assessed in other areas in Europe (e.g. France).

Several legislative provisions affect associated biodiversity, like the 2008 Walloon Forest Code ('Code forestier'), the Natura 2000 directive, the Circulaire on biodiversity for public forests, the hunt law to reduce large game species, the CAP, the legislation on manure, etc.

b. Ecosystem services
Agro-environment measures (rural development programme): creation and maintenance of field margins, landscape elements, reduced tillage, mechanical weed control, reduced pesticide use, … are subsidized. These practices are supposed to have positive effects on associated biodiversity like insects (pollinators, natural enemies of pest species), birds, soil biodiversity, erosion, etc.

Public bodies (provinces, municipalities …) promote the creation of flowering field margins and sowing flowers by distributing free flower seed mixtures, both to farmers and citizens.

Faced with the widespread loss of biodiversity (and its significant socio-economic consequences for the Region), Wallonia seeks to supplement its response by developing decision-making tools based on the concept of ecosystem services. More specifically it means to make its actions more interdisciplinary in regard to environmental conservation by using the ability of this concept to establish links between ecosystems and society, conservation and development. To this end, an administrative-scientific platform was launched in late June 2014. At this stage (2015), the aim of the platform will be to establish a conceptual framework and general methodology in line with future developments, as well as a preliminary map and assessment of ecosystem services on a regional scale, including those relating to food and agriculture.

NB: a report on the mapping of ecosystem services in Wallonia was produced in 2013

A number of legal provisions affecting ecosystem services, such as legislation on pesticides and biocides, legislation on fertilisers, the Common Agricultural Policy (CAP), etc.

c. Wild foods
It should be noted that the Walloon government Decree of 12 May 2011 prohibits the sale of and thus limits the supply for final consumption of any dead bird as well as any part or product obtained from the said easily identifiable bird, if the bird in question belongs to one of the following species: European woodcock, Canada goose, Eurasian coot and Eurasian teal. In practice, only consumption by the hunter him/herself or the transfer of these products by the hunter to a third party for personal consumption is permitted.

Freshwater Fishing: measures against overfishing: to develop or optimize the fish habitat by intensive cooperation with the water management authorities. The large part of the fisheries fund is used to improve the fish habitat (construction of spawning grounds for fish, solving fish migration barriers ...), to stimulate rod recreation and give scientific support to the fisheries industry. Moreover restocking of fish is performed annually in the public waters. In recent years, the fisheries fund has also invested a lot on information campaigns for the angler.

In case the fish population declines as a result of overfishing or pollution, busier or heavier transport by water or other causes, this can be solved by restocking. When restocking, we take into account the capacity of the water, the status of the population, the natural reproduction and the rod. The status of the population is established by fish count (Meiresonne & Turkelboom, 2012).

In Wallonia, to fight biodiversity erosion in fish and crayfish in watercourses, the following measures are planned: 1) Modifying the legal framework for recreational fishing to better protect species in demographic difficulty, and vulnerable and endangered species; the legal measures to be implemented provide for reducing allowable catch; 2) Producing fishery management plans for each sub-catchment area; these plans will provide for programmes aiming to improve aquatic habitats (free movement of fish, etc.), but also with targeted stocking to reinforce populations or reintroduce regionally extinct species (Atlantic salmon, sea trout, noble crayfish, etc.); 3) Researching a better spatial and temporal balance between fishing supply and demand across the region and sub-catchment area.

In Wallonia, there are several types of measures. Several legal provisions in the 2008 Forestry Act and the Natura 2000

provisions on biodiversity contribute to improving the environment's carrying capacity for fauna especially through production of small wild fruit and grass species.
In parallel, a range of provisions in application of the Hunting Act aim to reduce populations of big game and move towards a balance between wild fauna and the forest environment.

CHAPTER 3: The state and trends of biodiversity for food and agriculture

Proposed structure of the chapter and information to be included in the Country Reports

The main objective of this Chapter is to describe the state of biodiversity for food and agriculture in the country, with an emphasis on associated biodiversity and wild foods, and to identify current trends. The Chapter should also indicate current gaps and future needs and priorities. Where possible, countries should identify interventions required to support maintenance of associated biodiversity and indicate whether action is required at local, national, regional or global levels.

This Chapter will seek information on the following topics:

- The state of diversity between and (where any information exists) within species with respect to associated biodiversity and wild foods;
- The importance of the different components of associated biodiversity in relation to ecosystem services;
- The main factors influencing the state of genetic diversity with an emphasis on threatened and endangered species and resources;
- The state of activities and of the development of monitoring and information systems on the state of biodiversity for food and agriculture;
- The state of any specific conservation actions that target associated biodiversity and wild foods;
- Major gaps in the information available and opportunities and priorities for improving knowledge of state and trends of biodiversity for food and agriculture.

Where possible, indicate whether the information systems are gender-sensitive, specifying to what extent the different types and levels of knowledge of women and men are taken into account.

IMPORTANT: Throughout these guidelines, questions on production systems will refer to the production systems identified in Table 1 as present in your country.

One of the main objectives of this report is to identify knowledge gaps and to provide baseline information for future assessments. Thus please indicate where information is unavailable.

Overall synthesized assessment of forest, aquatic, animal or plant genetic resources

Countries that previously presented or are currently preparing a Country Report on Forest, Aquatic, Animal or Plant Genetic Resources may have important information on genetic diversity in these various reports. Therefore, Countries may wish to take full advantage of their different sector reports to develop a comprehensive description and comparison of the state, trends, and state of conservation of forest, aquatic, animal or plant genetic resources. The following indications are designed to provide guidance on the topics that could be addressed.

20. Describe the overall 1) state, 2) trends and 3) state of conservation of diversity of forest, aquatic, animal or plant genetic resources in your country with respect to:

a) common characteristics shared by all sectors;
b) major differences between sectors;
c) synergies or trade-offs in the state of diversity between sectors.

The responses should include relevant information on socio-economic, political and cultural dimensions as well as biological ones. Information on the significance of common characteristics, differences, synergies and trade-offs with respect to achieving food security and nutrition, sustainable production or the provision of ecosystem services should also be provided.

Animal genetic resources
Livestock breeding in Belgium is generally characterized by a high degree of intensification (feed, veterinary medicine ...) and a highly developed infrastructure (stables, air-conditioning ...). This means that the impact of the (natural) environment is limited and hence that only a limited number of animals, mainly cattle, pigs and poultry, are bred intensively. This is most pronounced in large agricultural businesses. This trend will be further enhanced when more and more farmers will retire in the near future without having someone taking over the business.

On the other hand, the conservation of indigenous species, mainly sheep, goats, horses, poultry and rabbits very much depends on the efforts hobby-farmers make.

Mainly the introgression of (foreign) cattle varieties is often a threat to the conservation of local cattle varieties.
Through a number of measures, we try to maintain the genetic diversity:

- Measures regarding rural development: support being given to breeders of local varieties. In 2013, there were 267 Flanders RDP II-term contracts amounting to 4040 livestock units.
- Support for pedigree associations implementing conservation and improvement programs
- Supporting a cryobank (in and BY Wallonia) where the genetic material of certain varieties is stored.

Plant Genetic Resources
Currently Belgium is preparing a report monitoring the implementation of the second global plan of action for plant genetic resources for food and agriculture. This report will be completed in 2015-2016 whereas based on the available data it will contain information on the state and trends in the use and conservation of plant genetic resources for food and agriculture in Belgium.

Forest Genetic Resources
In Flanders, we currently invest in the local genetic diversity of native trees and shrubs. The efforts for the selection and breeding of trees in terms of quality wood will be somewhat reduced in the near future. On the other hand, additional efforts will be made in favour of the conservation goals to be achieved in special protection areas (NATURA 2000).

In Wallonia, the importance of provenance and genetic diversity is taken into consideration during reforestation. The region has established a public seed bank (Comptoir Forestier of the DNF, Belgium's department of forestry and natural resources). The centre is a key stakeholder, actively harvesting and distributing seeds from advisable genetic provenances for silviculture. It is also currently the number one public body for forest genetic resource management programmes.

Throughout harvesting and sales, measures are taken to promote genetic diversity wherever possible (harvesting from a minimum number of trees, etc.).
The seed bank sells seeds from all forest species, both deciduous and coniferous, to private nurseries that grow plants to be used in forests.

The focus is also becoming more on developing a production sector for native shrubs favourable to biodiversity.

Wallonia has also developed seed orchards, either of species intended for wood production or for conservation purposes, e.g. the European crab apple.

Aquatic genetic resources
In Wallonia, many wild populations of brown trout (Salmo trutta), European grayling (Thymallus thymallus), barbel (Barbus barbus), common nase (Chondrostoma nasus) and noble crayfish (Astacus astacus) have been genetically analysed using microsatellite markers (nuclear DNA) and mitochondrial markers, and often compared to baseline populations in rivers or farms of Wallonia (brown trout) or Europe (Astacus astacus, Thymallus thymallus). The findings indicate 1) An almost widespread introgression of non-native brown trout populations with domestic populations from stocking that sometimes dates back a long time (from the late 19th century); 2) Conservation of certain populations of brown trout in some isolated places that were not affected by stocking, with a still very visible genetic structure; 3) The presence of mixed populations in some places (trout, barbel, grayling, noble crayfish); 4) The presence of relict populations from stocking (noble crayfish). In many places, local brown trout varieties have been lost, particularly in the Scheldt basin, meaning breeding them is now impossible. These extinctions in all likelihood also caused a reduced ability in these species to adapt to their environment

In order to counteract this loss of biodiversity in Walloon fish populations, a reintroduction programme for extinct species has been implemented (Atlantic salmon, sea trout), as well as a breeding programme for local varieties of various species (brown trout, European grayling, noble crayfish, etc.). The aim of this programme is to redeploy these species or genotypes in places where they have died out.

State and trends of associated biodiversity and ecosystem services

This section seeks information on the state of associated biodiversity in different production systems and in relation to the provision of ecosystem regulating and supporting services.

21. Have any changes been detected in your country for the different production systems over the last 10 years in components of associated biodiversity? If so, indicate if trends are strongly increasing (2), increasing (1), stable (0), decreasing (-1) or strongly decreasing (-2) in Table 7. If no information is available, indicate not known (NK). If not applicable, (NA).

Table 7. Trends in the state of components of associated biodiversity within production systems.

Production systems	**Trends in last 10 years (2,1,0,-1,-2, NK, NA)** (Place pointer on the component of associated diversity name for a description)			
	Micro-organisms	Invertebrates	Vertebrates	Plants
Livestock grassland-based systems: Temperate	NK	1 (f.e. hoverflies),	-2 (farmland and r	-1
Livestock landless systems: Temperate	NA	NA	NA	NA
Naturally regenerated forests: Temperate	NK	NK	NK	1 (IPRFW: diversifi
Planted forests: Temperate	NK	NK	NK	1 (IPRFW: diversifi
Self-recruiting capture fisheries: Temperate	NK	NK	+1 (twaite shad, s	NK
Fed aquaculture: Temperate	NA	NA	NA	NA
Rainfed crops : Temperate	NK	1 (f.e. hoverflies),	-2 (farmland and r	-1
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	NK	NK	NK	NK

22. Briefly describe the changes or trends in diversity recorded in Table 7. Where possible provide information on: baseline levels (last 10 years, indicate if otherwise), measurements and indicators used, the extent of change, and the likely cause(s). Include references to the sources of information.

In Demolder et al. (2014) an overview of the available biodiversity indicators is given with respect to the status and trends of biodiversity in Flanders. As in other countries, the availability and quality of the data is linked to the cultural importance of species and ecosystems. Knowledge of distinctive, iconic species or colourful groups like mammals, flowering plants, butterflies and dragonflies is relatively good, while the knowledge of organism groups such as bacteria, fungi and many soil insects that support numerous services is inadequate. Only a small portion of biodiversity is visible through the natural indicators. Unfortunately, this does not allow assessing the role of biodiversity for the delivery of ecosystem services.

Pollinators (De Bruyn, 2014a): data are unsufficient and do not allow determining trends in pollination by natural pollinators, because the different groups of insects that can vouch for pollination are not systematically monitored. If we want to determine the evolution of the population of pollinators, we can only rely on non-standardized data (e.g. www.waarnemingen.be for Flanders).www.waarnemingen.be for Flanders). This will give an indication on the increase or decrease of certain taxa over different time periods. Changes are estimated by comparing, for example, observation frequencies over different time periods.

Carvalheiro et al. (2013) examined evolutions among pollinating insects in Great-Britain, the Netherlands and Belgium. They compared 3 time periods: 1950-1969, 1970-1989 and 1990-2009. They found that the loss of biodiversity and the increase in biotic homogenization reached a high level in 1990. During the last decade, this negative trend was much less significant or even positive for certain taxa.

Rasmont et al. (2005) report that of the 360 bee and bumblebee species in Belgium, 91 have declined in numbers. They compared the population density in the period before and after 1950. 145 species populations remained stable and 39 species populations were doing a lot better. The long-tongued species had dropped the most. The authors alleged that this was because of the decline in flowers with a long corolla (as in the plant family Lamiaceae, Fabaceae, Scrophulariaceae), but they found no evidence for it.

Breeding birds. The Flemish Atlas of Breeding Birds shows that the number of several bird species has dropped with more than 50% over the last 30 years. The number of skylarks (Alauda arvensis) has even decreased by approximately 95%, and species such as ruff (Philomachus pugnax) and ortolan (Emberiza hortulana) are now extinct as a breeding bird in Flanders. Almost all typical farmland birds have recently been put on the Red List of Flemish breeding birds (Strubbe et al, 2010).

Freshwater Fish: In recent years, the water quality in the Scheldt estuary has improved. Thanks to this some fish and sting like fint and sea lamprey, being regional fish, occur again. Some 50% of these fish are still marked on the Red list (Demolder & Peymen, 2012). In Wallonia, a reappearance of the sea trout has been observed in the Meuse basin since 1987. However, the European eel, once abundant, is now endangered.

Forests: Wallonia has seen an increase in the average number of species present in forest stands, a decrease in the percentage of single-species stands and an increase in the percentages of other stand types (with 2 species, 3 species, 4 or more species, etc.). Cleared undergrowth encourages shrub and grass growth, which is favourable for related animal species.

23. Have any changes been detected in your country for the different production systems over the last 10 years in regulating and supporting ecosystem services? If so, indicate if trends are strongly increasing (2), increasing (1), stable (0), decreasing (-1) or strongly decreasing (-2) in Table 8. If no information is available, indicate not known (NK). If not applicable, (NA).

Table 8. Trends in the state of regulating and supporting ecosystem services within production systems.

Production systems	**Trends in last 10 years (2,1,0,-1,-2, NK, NA)** (Place pointer on the ecosystem service name for a description)

	Pollination	Pest and disease regulation	Water purification and waste treatment	Natural hazard regulation	Nutrient cycling	Soil formation and protection	Water cycling	Habitat provisioning	Production of oxygen/ Gas regulation
Livestock grassland-based systems: Temperate	NA	NK	-1	NK	-1	-2	NK	NA	NA
Livestock landless systems: Temperate	NA	NK	0	NK	-1	NA	NK	NA	NA
Naturally regenerated forests: Temperate									
Planted forests: Temperate	NK	NK	+1	NK	NK	+1	+1	NK	NK
Self-recruiting capture fisheries: Temperate									
Fed aquaculture: Temperate									
Rainfed crops : Temperate	-2	-1	-1	NK	-2	-2	NK	-2	NK
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate									

24. Briefly describe the changes or trends in diversity recorded in Table 8. Where possible provide information on: baseline levels (last 10 years, indicate if otherwise), measurements and indicators used, the extent of change, and the likely cause(s). Include references to the sources of information.

Not all trends have been studied over the past 10 years:

Forests

Expansion of timber harvesting (e.g. no clearcuts) and transformation of very highly productive conifer forests to mixed forests result in less acidification and leaching which leads to a (slight) improvement of water quality and to a slight improvement of **the water storage and supply capacity**.

Wood-producing vegetation (forests, hedgerows) offers a **high protection against erosion**. The clearing of trees on steep slopes will have a negative influence on the protection against erosion. Public authorities have introduced strict conditions for the clearing of trees on a steep slope (regulations on the evacuation of the trees, cabling, authorized areas and thinning regulations ...). As a result, the clearing of trees rarely cause problems (Vandekerkhove et al, 2014).

Measurements show that sandy forest soil strongly **acidified** over the past 50 years, acidifying sediment being one of the main causes. In clay soil, acidification was less clear in the litter layer and in the upper mineral layers. The Environment Outlook 2030 report forecasts a gradual recovery of the forest soil acidification due to a sharply reduced S-sediment and a gradual reduction of the N-sediment.

In forests, where no fertilizers are being used, the evolution of the **organic carbon** is different to the evolution in farmlands or pastures. Between 1960 and 2000, the organic matter content in the top layer of the soil increased, which could be associated with the increased acidification as a result of atmospheric N- and S-sediment resulting in a more difficult breakdown of organic matter. The organic carbon stock is higher in forests than it is on fields (Cools & Van Gossum, 2014).

Arable and livestock farming

(The second part of the answer to question 24 is added in the text field of question 26, because of a restricted number of characters in this text field.)

25. Is there evidence that changes in biodiversity for food and agriculture have impacted ecosystem services in your country? Indicate if strongly increasing (2), increasing (1), stable (0), decreasing (-1) or strongly decreasing (-2) in Table 9 and provide a description of specific situations and documentation where available.

Table 9. Impact of changes in biodiversity for food and agriculture on ecosystem services.

Production systems	**Changes**	**Impact of changes in biodiversity for food and agriculture on ecosystem services** (2, 1, 0,-1, -2, NK, NA) (Place pointer on the ecosystem service name for a description)								
		Pollination	Pest and disease regulation	Water purification and waste treatment	Natural hazard regulation	Nutrient cycling	Soil formation and protection	Water cycling	Habitat provisioning	Production of oxygen/ Gas regulation
Livestock grassland-based systems: Temperate	Changes in animal genetic resources	NA	NK	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	NK	+1	NA	NA	NA	-1	NA	NK	NA
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
Livestock landless systems: Temperate	Changes in animal genetic resources	NA	NK	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
Naturally regenerated forests: Temperate	Changes in animal genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Changes in crop genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in forest genetic resources	NK	NK	+1	NK	NK	NK	+1	NK	NK
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
Planted forests: Temperate	Changes in animal genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in forest genetic resources	NK	NK	+1	NK	NK	NK	+1	NK	NK
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
Self-recruiting capture fisheries: Temperate	Changes in animal genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fed aquaculture: Temperate	Changes in animal genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK

	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rainfed crops : Temperate	Changes in animal genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in crop genetic resources	-1	-1	NK	NK	NK	-1	NK	-1	NK
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	-1	-1	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	-1	-1	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	-1	NK	NK	NK	NK	NK	NK	NK	NK
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	Changes in animal genetic resources	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in crop genetic resources	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in forest genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in aquatic genetic resources	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Changes in micro-organism genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in invertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in vertebrates genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK
	Changes in plants genetic resources (associated biodiversity)	NK	NK	NK	NK	NK	NK	NK	NK	NK

26. Briefly describe the impacts on ecosystem services recorded in Table 9. Where possible provide information on: baseline levels (last 10 years, indicate if otherwise), measurements and indicators used, the extent of change, and the likely cause(s). Include references to the sources of information.

The first paragraph in this text field is the answer to the second part of question No. 24:

Arable and livestock farming
The current situation of the chemical soil fertility in the Flemish farmland and grassland soil is usually good in terms of acidity, but the organic matter content is significantly lower than on other plots in Flanders. Since the early 90s the carbon content in arable plots has fallen. In the period 2004-2007, more than half of the sampled plots were low in carbon. Plots rich in organic matter are little by little becoming rare. In the period 2008-2011, a permanent improvement has been detected. Future measurements will prove if it the current trend will break (Cools & Van Gossum, 2014).
Concerning soil pollution in Wallonia, various studies have found a loss in biodiversity related to the toxicity of metallic trace elements (MTE) or organic micropollutants for bacteria, earthworms, nematodes, collembola, and acari. These effects mean some soil organisms can be used as bioindicators, or for ecotoxicity testing. Some specialised microorganisms are however capable of breaking down organic pollutants and can thus be used or function naturally as pollution control agents (http://etat.environnement.wallonie.be/index.php?mact=rapportanalytique,mc7155,default,1&mc7155what=fiches&mc7155alias=La-fertilite-et-la-biodiversite-dans-les-sols&mc7155returnid=17&page=17).
Pesticides can have negative effects on natural enemies because of direct mortality, but also indirectly by acting on their

movement abilities, foraging or reproduction speed reducing their effectiveness. Crops that provide food for natural enemies can support larger natural enemy populations that are better nourished and therefore be more fruitful. This can also be realized through buffer strips and small landscape elements. Large monocultures usually have a short flowering period or no flowering period at all (De Bruyn, 2014b).

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Answer to question No. 26:

Biodiversity loss affects the smooth functioning of ecosystems. But the loss of ecosystem quality also results in a further loss of biodiversity. If an ecosystem does no longer function smoothly, ecosystem services also decline. If biodiversity has a positive effect on ecosystem functions, the services provided by ecosystems to mankind will decline together with the decline in biodiversity. If there are a vast number of species, a decline in biodiversity will initially have little effect because the ecosystem functions smoothly and ecosystem services are taken over by other species. As the number of species decreases, it is more likely that essential functions are affected and the effects of the progressive loss of biodiversity will spread out.

There is scientific evidence that there is a positive and causal link between biodiversity on the one hand and the functioning of ecosystems and the supply of services by ecosystems on the other hand. Further research on the exact role of biodiversity is required (Visietekst Werkgroep Metaforum Leuven, 2010).

The breeding of new crop varieties and the official testing in Belgium of the agricultural value of the variety before marketing (as defined in the EU legislation) focus on pest resistant or more tolerant varieties by setting the testing criteria (protocols) in favour, having a positive effect on pest regulation in general.

Crop genetic resources
Crop selection has an effect on the soil quality. Generally, grassland soil has a higher degree of diversity than cropland soil (D'Haene et al, 2010). The reduction of the grassland area and the increase in the acreage of arable land by conversion of permanent grassland into temporary grassland and farmland has caused a decrease in the organic carbon stocks and organic matter. The decline in the share of cereals in favour of corn and root crops since the nineties is considered to be a cause of the decline in organic matter in the soil (Cools & Van Gossum, 2014).

Crops that provide food for natural enemies can support larger natural enemy populations foods that are better nourished and therefore be more fruitful. Large monocultures usually have a short flowering period or no flowering period at all (De Bruyn, 2014b).

Crop and plants genetic resources
On a landscape level, intensification of agriculture leads to larger fields, a lower diversity of crops and herbs and the loss and fragmentation of (semi) natural systems like (old) grasslands, thickets, forests and small landscape elements. Habitat loss due to human intervention is generally assumed to be the main cause of the decline in pollinators worldwide (De Bruyn et al, 2014a).

Micro-organism and invertebrates genetic resources
Agriculture affects the diversity of microorganisms and invertebrates. Large plots, low tillage, use of pesticides, disappearing small landscape elements, monocultures, etc. reduce the survival of natural enemies of the working population of pest species. This has implications for a number of ecosystem services such as pollination, pest control and soil fertility.

Forest genetic resources
In recent decades, large areas of highly productive hardwood and softwood (poplar, Corsican pine, larch, Oregon pine) converted to mixed (less productive) forests or deforested areas in order to restore open habitats. Expansion of timber harvesting and transformation of very highly productive conifer forests to mixed forests leads to a slight improvement of the water storage and supply capacity. Moreover, it leads to less acidification and leaching, resulting in a water quality improvement (Vandekerkhove et al, 2014).

Prohibiting the planting of conifers within 12 to 25 m of watercourses depending on the soil type (Forestry Act Art. 71.5) also has an impact on the improvement of the aquatic environment.

27. List any associated biodiversity species or sub-species (if information is available) that are in some way actively managed in your country to help provide regulating or supporting ecosystem services in Table 10. Indicate in which production systems they occur and indicate if diversity information is available. Provide any available sources of information.

Table 10. Associated biodiversity species that are in some way actively managed in your country to help provide regulating or supporting ecosystem services.

Ecosystem service provided (Place pointer on the ecosystem service name for a detailed description)	**Actively managed species (name) and sub-species (where available)**	**Production systems (code or name)**	**Availability of diversity information (Y/N)**	**Source of information**
Pollination	Honey bee (Apis mellifera), Bumblebee (Bombus terrestris, B. ignites, B. canariensis)	C11 and C7 (greenhouse farming) orchards, rape, strawberries		Private beekeepers, breeding companies and nature organisations
Pest and disease regulation	Introduction of species of predatory mites, parasite wasps, in greenhouses	C11 and C7 (greenhouse farming) orchards		Breeding companies
Water purification and waste treatment				
Natural hazard regulation				
Nutrient cycling	Atlantic salmon (Salmo salar), trout (Salmo trutta), Grayling (Thymallus thymallus)	A3 and A11	Y	Walloon Nature and Forest Department (Département de la Nature et des Forêts - DNF -Service de la Pêche)
Soil formation and protection	Regarding remediation of contaminated soil, few or no bioremediation techniques are currently being used; regarding composting, regulations are focused more on sanitising composts, despite a wide range of methods being available, so we cannot say that "biodiversity" is the priority here			
Water cycling	/			
Habitat provisioning				
Production of oxygen/ Gas regulation				
Other [*please specify*]:				

28. Does your country have monitoring activities related to associated biodiversity? If yes, describe these. Where possible provide information on the components of associated biodiversity that are monitored and on the geographical coverage of the monitoring system (local, regional, national, global). Include references to the sources of information, if possible.

• European Member States must report in detail on the species enlisted in the European Habitat and Birds Directives. As far as

Flanders is concerned, we are speaking about 59 habitats and 60 species. Only 9 of the 59 species of (15%) are rather doing well, among them three amphibians, one fish and five bats. More than half of the species (58%) are in a very bad conservation state and another 17% are in a poor conservation state. Of approximately 10% of the species, we could not determine the state they are in (Demolder et al., 2014). Compared with 2007, 14 species improved their conservation status, but the conservation status of 17 other species worsened during the same time period (Demolder & Peymen, 2012; Louette et al., 2013).

• Breeding birds are monitored in the framework of the European Breeding Birds Index and include a number of birds typical of agricultural areas (www.natuurindicatoren.bewww.natuurindicatoren.be).

• In order to assess the impact of agro-environmental measures on biodiversity in the agricultural sector, the Research Institute for Nature and Forest (INBO) created in 2010 a monitoring network allowing the monitoring of the evolution and number of arable and grassland bird species. These monitoring activities will be continued in the coming years. (http://lv.vlaanderen.be/nlapps/docs/default.asp?id=1965).

• There are some research projects monitoring natural enemies and their relation with pest species, for example the Interreg IVa research project 'SOLABIO' (http://www.vlm.be/algemeen/Projecten/detail/Pages/default.aspx?itemId=218&webId=56d32dc9-29d8-46c9-8224-467b784d49d8http://www.vlm.be/algemeen/Projecten/detail/Pages/default.aspx?itemId=218&webId=56d32dc9-29d8-46c9-8224-467b784d49d8).

• Many networks of warning systems (www.waarschuwingen.be) monitor pest species associated with particular crops as a part of an integrated pest management in agriculture and horticulture, for example vegetables, fruit, potatoes, tree nurseries, chicory, winter wheat,… Examples: www.pcainfo.be, www.lcg.be, www.lcvvzw.be, www.proefcentrum.be, www.inagro.be, www.pcfruit.be , http://www.gembloux.ulg.ac.be/pt/pic/, http://www.irbab-kbivb.be/fr/menu.php, http://www.asblgawi.com/fint.html, http://www.gembloux.ulg.ac.be/pt/appo/Menu/conduite_des_cultures/index.htmwww.pcainfo.be, www.lcg.be, www.lcvvzw.be, www.proefcentrum.be, www.inagro.be, www.pcfruit.be , http://www.gembloux.ulg.ac.be/pt/pic/, http://www.irbab-kbivb.be/fr/menu.php, http://www.asblgawi.com/fint.html, http://www.gembloux.ulg.ac.be/pt/appo/Menu/conduite_des_cultures/index.htm,….

• Monitoring of the European hamster. (http://www.limburg.be/Limburg/pers/2014-09-08-Verspreiding-Europese-hamster-in-kaart-gebracht.html)(http://www.limburg.be/Limburg/pers/2014-09-08-Verspreiding-Europese-hamster-in-kaart-gebracht.html)

• Waarnemingen.be is an initiative of Natuurpunt Studie vzw and the Stichting Natuurinformatie. It gives an overview of the observations made by volunteers and working groups (www.waarnemingen.be).

• Reintroduction of salmon into the Meuse basin

• Natagora's (Wallonia) and Natuurpunt's (Flanders) Bird and Butterfly counting days and weekends
http://www.natagora.be/oiseaux/index.php?id=devine_qui_oiseaux
- http://vogelweekend.natuurpunt.be/
- http://www.natagora.be/papillons/index.php?id=devine_qui_papillons
- http://www.natuurpunt.be/het-grote-vlinderweekend-0http://www.natagora.be/oiseaux/index.php?id=devine_qui_oiseaux
- http://vogelweekend.natuurpunt.be/
- http://www.natagora.be/papillons/index.php?id=devine_qui_papillons
- http://www.natuurpunt.be/het-grote-vlinderweekend-0

Species of associated biodiversity at risk of loss

In this section the objective is to identify species of associated biodiversity within the country that are at significant risk of loss, degradation or extinction.

29. List in Table 11 any components of associated biodiversity for which there is evidence of a significant threat of extinction or of the loss of a number of important populations in your country. Specify the degree of the threat according to the classification in use in your country or following the IUCN Red List Categories and Criteria. Include a description of the threat and list references or sources of information if available.

Table 11. Main threats to associated biodiversity identified as at risk.

Associated biodiversity species	Degree of threat	Main threat	References or sources of information if available

Associated biodiversity species	Degree of threat	Main threat	References or sources of information if available
Yellowhammer (Emberiza citrinella)	under threat	Intensification in agriculture	Vermeersch et al. (2004)
Corn bunting (Miliaria calandra)	under threat	Intensification in agriculture	Vermeersch et al. (2004)
Sky lark (Alauda arvensis)	vulnerable	Intensification in agriculture	Vermeersch et al. (2004)
Partridge (Perdix perdix)	vulnerable	Intensification in agriculture (see table 15)	Vermeersch et al. (2004)
European hamster (Cricetus cricetus)	under serious threat	Intensification in agriculture – winter wheat	Criel et al. (1994)
Wild honeybees	More than 50% of the species in serious regression up to extinct	Pesticides, loss of habitat quality and their nutritive resources	Terzo et Rasmont (2007)
Eel (Anguilla anguilla)	Endangered for extinction	Over-exploitation	Vlietinck et al. (2010)
For Walloon freshwater fish, overall 15% (10) of these fish species are extinct in the region, 5% (3) are critically endangered, 3% (2) are endangered, 17% (11) are vulnerable, 3% (2) are data deficient, and 23% (15) are of least concern. 21 of the fish species are non-native.			

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Conservation of associated biodiversity

This section collects information on the state of conservation of components of associated biodiversity providing ecosystem services within production systems in your country.

30. Does your country currently have any *ex situ* conservation or management activities or programmes for associated biodiversity for food and agriculture? These may include, for example, culture collections, collections of pollinators, etc. If so, list these in Table 12.

Table 12. *Ex situ* conservation or management activities or programmes for associated biodiversity for food and agriculture.

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Micro-organisms					
Invertebrates	Honey bee (Apis mellifera), Bumblebee (Bombus terrestris, B. ignites, B. canariensis)		Private breeders and companies (e.g. Biobest)	Hobby or commercial	
Invertebrates	Natural enemies of pest species (Introduction of species of predatory mites, parasite wasps, in greenhouses)		Companies	Commercial	
Invertebrates	Crayfish (Astacus astacus)	A few thousands	Isolate sites in Wallonia	Conservation and re-introduction	

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Vertebrates	European hamster (Cricetus cricetus)	300 (estimation)	Breeding programme	Conservation and re-introduction	
Vertebrates	Atlantic salmon (Salmo salar)	100 breeders (estimation)	Breeding programme in Wallonia (Erezée)	Conservation and re-introduction	
Vertebrates	Seatrout (Salmo trutta trutta)	150 breeders (estimation)	Breeding programme in Wallonia (Erezée)	Conservation and re-introduction	
Plants	Wild Phaseoleae – Phaseolinae species	The collection currently includes 2075 accessions representing 232 taxa of the Phaseoleae tribe.	The Botanic Garden of Meise holds a collection of wild Phaseoleae - Phaseolinae species. The collection covers a very wide genetic diversity. Seeds for conservation and distribution are collected from plants cultivated in glasshouses of the Garden. They are dried at 15°C and 15% relative humidity to equilibrium moisture constant (5%) and afterwards stored in hermetically sealed packages at -20°C.	The main objective is to conserve on a long-term basis the largest possible genetic diversity through seed samples stored at –20° C. The collection provides the basic material at the disposal of the study of the global genetic diversity and of the improvement of food legumes, in particular for the genera Phaseolus and Vigna.	

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Plants	Seed Bank: plant conservation. This mainly concerns the Belgian wild flora, but also other floras in which the Botanic Garden is specialized (Europe and Central Africa		The Botanic Garden of Meise	- to improve the quality of the collections at the seed bank, the only one in Belgium to focus on wild plants. This implies a continuous evaluation of existing collections, the preparation and implementation of a program to collect seeds of all endangered Belgian species, and the acquisition of new equipment. - To make the link between in situ and ex situ conservation. In this framework, to reintroduce or to reinforce populations from endangered species.	

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31. Does your country currently have any *in situ* conservation and management activities or programmes in your country that support the maintenance of associated biodiversity? If so provide any available information on organisms and species managed or conserved, site name and location, production system(s) involved, conservation objective and specific actions that secure associated biodiversity or ecosystem services (if any).

Table 13. *In situ* conservation or management activities or programmes for associated biodiversity for food and agriculture.

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Site name and location	Production system(s) involved (code or name)	Conservation objective(s)	Specific actions that secure associated biodiversity or ecosystem services
Micro-organisms					
Invertebrates	Foraging insects	Wallonia: location dependent on the expert's advice	C11/M3	Conservation and development in regression (wild bees and butterflies)	Sowing, cutting operations and partial summer forage harvesting leaving thin 3 to 30 m wide strips of flower-rich pasture instead of cropland. Use of regional ecotypes. Voluntary measures as part of Wallonia's agri-environmental measure programme (Walloon rural development programme).

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Site name and location	Production system(s) involved (code or name)	Conservation objective(s)	Specific actions that secure associated biodiversity or ecosystem services
Invertebrates				To protect and maintain native species and natural habitats in Wallonia, under 2009-2014 legislature the Minister for Sustainable Development launched a Biodibap (derived from the French words Biodiversité and bâtiments publics meaning biodiversity and public buildings) call for projects three times. This call aimed to promote installations in public buildings with a view to encouraging biodiversity, in the interests of cohabitation. Particular attention was paid to pollinating insects (flower-rich meadows, hives, insect hotels, etc.).	
Invertebrates	Crayfish (Astacus astacus)	Designated areas in Wallonia	A3 and A11	Conservation	Translocation of individuals for new populations emergence

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Site name and location	Production system(s) involved (code or name)	Conservation objective(s)	Specific actions that secure associated biodiversity or ecosystem services
Vertebrates	European hamster (Cricetus cricetus)	Two regions Bertem and Widooie	C11	In the agro-environmental schemes (AES) of Flanders, certain measures aim at the conservation of vulnerable species. These measures are only applied within certain defined areas, based on the species (group) range and occurrence.	Growing of Luzerne, an uncommon crop in Flanders. Growing wheat strips without harvesting the crop, in combination with non-inversion tillage (for a full description, condition and subsidies: www.vlm.be) For the European hamster, some support is given by providing artificial burrows in agricultural fields .
Vertebrates	Meadow birds Farmland birds	Designated areas	L3 C11 M3	In the agro-environmental schemes (AES) of Flanders and Wallonia, certain measures aim at the conservation of (the habitats of) vulnerable species. These measures are only applied within certain defined areas, based on the species (group) range and occurrence.	Meadow birds: options: -delay of mowing and grazing dates on meadows and pastures, -conversion of arable farmlands to grassland, -provision of protecting harnesses around the bird nests, -adaptive mowing practices (for a full description, conditions and subsidies: www.vlm.be and "Walloon rural development programme"). Farmland birds: options: -Strips sown with a mix of grass species and herbs, with adapted management (no pesticides, adaptive mowing) -Farmland with cereals as food for the winter time (no harvest) -…

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Site name and location	Production system(s) involved (code or name)	Conservation objective(s)	Specific actions that secure associated biodiversity or ecosystem services
Vertebrates	Species associated with low intensive use of meadows	Wallonia, location according to expert advice	C11/M3	Habitat conservation for protected species including: Common European Adder (Vipera berus), Grass Snake (Natrix natrix), Great Crested Newt (Triturus cristatus), Common Snipe (Gallinago gallinago), Whinchat (Saxicola rubetra), Large Copper (Lycaena dispar), etc.	Contracts for extensive use of meadows with requirements modified to accommodate objectives from expert advice. Voluntary measures as part of Wallonia's agri-environmental measure programme (Walloon rural development programme).
Vertebrates	Species associated with low intensive use of meadows	Wallonia, location according to detailed Natura 2000 map	C11/M3	Habitat conservation for protected species including: red-backed shrike (Lanius collurio), great grey shrike (Lanius excubitor), common snipe (Gallinago gallinago), lesser horseshoe bat (Rhinolophus hipposideros), greater horseshoe bat (Rhinolophus ferrumequinum), western barbastelle (Barbastella barbastellus) and Geoffroy's bat (Myotis emarginatus)	Mandatory statement of requirements in application of the Directives "oiseaux" (birds) (2009/147/CE) or "habitats" (92/43/CEE), supplemented where appropriate by expert advice and an agri-environmental measure.
Vertebrates	Atlantic salmon (Salmo salar)	Designated areas in Wallonia	A3	Reintroduction	Restocking of parrs in Wallonie (Ourthe, Amblève, Lesse…).

Components of associated biodiversity	Organisms, species and sub-species (where available) conserved	Site name and location	Production system(s) involved (code or name)	Conservation objective(s)	Specific actions that secure associated biodiversity or ecosystem services
Vertebrates	SeaTrout (Salmo trutta trutta)	Designated areas in Wallonia	A3	Reintroduction	Restocking of juveniles in Wallonian Rivers (Ourthe, Amblève, Lesse, Vesdre…).
Plants	Endangered field flowers (segetal plants)	Wallonia, location according to expert advice and zoning	C11/M3	Habitat conservation for endangered species of field flowers	Contract for extensive use (grain-based crop rotations) with requirements modified to accommodate needs of species present. Voluntary measures as part of Wallonia's agri-environmental measure programme (Walloon rural development programme).

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32. What activities are undertaken in your country to maintain traditional knowledge of associated biodiversity? Has traditional knowledge of associated biodiversity been used to inform conservation and use decisions in your country? Please share best practices and lessons learned.

No information available.

33. Provide any available information on gender dimensions with respect to the maintenance of and knowledge about associated biodiversity. These may include differences in the roles and insights of women and men with respect to maintaining particular resources, monitoring their state, overseeing their management at different stages of production or ecosystem management.

No information available.

State and trends of wild resources used for food

34. **Provide in Table 14 a list of wild food species known to be harvested, hunted, captured or gathered for food in your country, and that are not already included in a completed or ongoing Country Report on Forest, Aquatic, Animal or Plant Genetic Resources. Indicate in or around which production system the species is present and harvested, and the change in state of the species over the last 10 years (strongly increasing (2), increasing (1), stable (0), decreasing (-1), or strongly decreasing (-2), or not known (NK)). Indicate where differences within species have been identified and characterized.**

Table 14. Wild species used for food in the country.

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Red deer	Cervus elaphus	Forests	0		Département de la Nature et des Forêts, Direction Chasse Pêche

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Deer	Capreolus capreolus	Forest environment, agricultural plain	+1		Meiresonne & Turkelboom, 2012; Département de la Nature et des Forêts, Direction Chasse Pêche
Fallow deer	Dama dama	Forests	1	Isolated populations. The only "wild" population is located in Ciergnon and is considered stable. The other populations (escaped individuals) are growing.	Département de la Nature et des Forêts, Direction Chasse Pêche
Wild boar	Sus scrofa	Forest environment, agricultural plain	NK	The more recent colonisation and large increase of the wild boar is currently limited to Flanders and the province of Limburg. In Wallonia, presence is more and more marked north of the Sambre-Meuse Valley.	Scheppers & Casaer, 2014; Département de la Nature et des Forêts, Direction Chasse Pêche ; Prévot & Morelle (2012)
Hare	Lepus europaeus	Open (agricultural) habitats by choice	-1	The changing agricultural practices are probably the cause of the reducing number of hare. The practices probably lead to a less successful reproduction and an increased mortality.	Scheppers & Casaer, 2014, Meiresonne & Turkelboom, 2012; Bourdouxhe & de Tillesse (2009) ; Bourdouxhe & de Tillesse (2010a) ; Bourdouxhe & de Tillesse (2010b) ; Bourdouxhe. (2012a) ; Bourdouxhe (2012b) ; Bourdouxhe (2013a).

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Pheasant	Phasianus colchicus	Open or mixed habits	-1	A further decline is also expected for phaesants, even though the underlying cause is not clear. Potential causes for these species are a modified hunting legislation (prohibition to free young phaesants), an increased predation pressure and a decrease in the quality of the habitat.	Scheppers & Casaer, 2014; Meiresonne & Turkelboom, 2012; Bourdouxhe & de Tillesse (2010) ; Bourdouxhe & de Tillesse (2010b) ; Bourdouxhe (2012b).
Patridge	Perdix perdix	Agricultural plain with predominantly cereal crops	0 to 2		Meiresonne & Turkelboom, 2012; Bourdouxhe & de Tillesse (2010a) ; Bourdouxhe & de Tillesse (2010b) ; Bourdouxhe (2012b).
Coot	Anas platyrhynchos		0	The current development of the population shows that the number of species (among which the coot) stays equal and that hunting does not threaten their future.	Meiresonne & Turkelboom, 2012; Scheppers & Casaer, 2014; Bourdouxhe (2013a)
Widgeon	Anas penelope		0		Meiresonne & Turkelboom, 2012
Greylag goose	Anser anser		+1		Meiresonne & Turkelboom, 2012
Canadian goose	Branta canadensis	Humid environment	+1		Meiresonne & Turkelboom, 2012; Bourdouxhe (2013a)
Lapwing	Vanellus vanellus				

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Woodpigeon	Columba palumbus	Open forest, urbanised etc. habitats	+1 to +2		Meiresonne & Turkelboom, 2012; Bourdouxhe & de Tillesse (2010b) ; Bourdouxhe (2012c) .
Rabbit	Oryctolagus cuniculus	Semi-open forest and bocage habitats	0 to +1		Meiresonne & Turkelboom, 2012; Bourdouxhe & de Tillesse (2010b); Bourdouxhe (2012c)
Bighorn	Ovis musimon	Forests	0	Isolated populations. Overall the Semois population is in decline (shooting plans), but the other populations in the Namur and Liege regions (Ourthe) are on the increase.	Source Département de la Nature et des Forêts, Direction Chasse Pêche
Woodcock	Scolopax rusticola	Forest and meadow habitats	0		Bourdouxhe & de Tillesse (2009). Bourdouxhe & de Tillesse (2010b) ; Bourdouxhe (2012b) .
Teal	Anas crecca	Humid environment			Bourdouxhe (2013a)
Common sole	Solea solea	Marine ecosystem (North sea)			Tessens (2012)
European plaice	Pleuronectes platessa	Marine			Tessens (2012)
European plaice	Pleuronectes platessa	Marine			Tessens (2012)
Anglerfish	Lophius piscatorius	Marine			Tessens (2012)
Brown shrimp	Crangon crangon	Marine			Tessens (2012)
Turbot	Psetta maxima	Marine			Tessens (2012)
Codfish	Gadus morhua	Marine			Tessens (2012)
Lemon sole	Microstomus kitt	Marine			Tessens (2012)

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Bril	Scophthalmus rhombus	Marine			Tessens (2012)
Ray	Batoidea spp.	Marine			Tessens (2012)
Squid	Cephalopoda spp.	Marine			Tessens (2012)
Great scallop	Pecten maximus	Marine			Tessens (2012)
Roach	Rutilus rutilus	freshwater	-1		Meiresonne & Turkelboom (2012); Philippart (2006)
Rudd	Scardinius erythrophtalmus	freshwater	-1		Meiresonne & Turkelboom (2012); Philippart (2006)
Dace	Leuciscus leuciscus	freshwater	0		Meiresonne & Turkelboom (2012); Philippart (2006)
Tench	Tinca tinca	freshwater	0		Meiresonne & Turkelboom (2012); Philippart (2006)
Orfe	Leuciscus idus	freshwater	0		Meiresonne & Turkelboom (2012); Philippart (2006)
Skelly	Squalius cephalus	freshwater	0		Meiresonne & Turkelboom (2012); Philippart (2006)
River trout	Salmo trutta m. fario	freshwater	-1	Various populations identified in Wallonia	Meiresonne & Turkelboom (2012)
Rainbow trout	Oncorhynchus mykiss	freshwater	NA	NNon-naturalised acclimatised species, from stocking	Philippart (2006)
Eel	Anguilla anguilla	freshwater			Meiresonne & Turkelboom (2012)
Nase	Chondrostoma nasus	freshwater	-1		Meiresonne & Turkelboom (2012) Philippart (2006)
Carp	Cyprinus carpio	freshwater	0	Species naturalised since Roman times	Meiresonne & Turkelboom (2012) Philippart (2006)

Species (local name)	Species (scientific name)	Production systems or other environments in which present and harvested	Change in state (2,1,0,-1,-2, NK)	Differences within species identified and characterized (Y/N)	Source of information
Pike-perch	Sander lucioperca	freshwater	0	Species naturalised since 1900, from stocking	Meiresonne & Turkelboom, 2012; Philippart (2006)
Red mullet	Barbus barbus	freshwater	0	Mix of populations in the Meuse basin	Meiresonne & Turkelboom, 2012; Philippart (2006)
Northern pike	Esox lucius	freshwater	0		Meiresonne & Turkelboom, 2012; Philippart (2006)
Perch	Perca fluviatilis	freshwater	0		Philippart (2006)
Red trout	Salvelinus alpinus	freshwater	+1	Non-naturalised acclimatised species, from stocking	Philippart (2006)
Common bream	Abramis brama	freshwater	0		Philippart (2006)
Silver bream	Blicca bjoerkna	freshwater	0		Philippart (2006)
Crucian carp	Carassius carassius	freshwater	0		Philippart (2006)
Gudgeon	Gobio gobio	freshwater	0		Philippart (2006)
Bleak	Alburnus alburnus	freshwater	-1		Philippart (2006)
Galician crayfish	Astacus leptodactylus	freshwater	+1	Invasive naturalised alien species	Philippart (2006)
Signal crayfish	Pacifastacus leniusculus	freshwater	+2	Invasive naturalised alien species	Philippart (2006)
American crayfish	Orconectes limosus	freshwater	+2	Invasive naturalised alien species	Philippart (2006)
Louisiana crayfish	Procambarus clarkii	freshwater	+2	Invasive naturalised alien species	Philippart (2006)

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Wild food resources at risk

In this section the objective is to identify uncultivated and wild species used for food within the country that are at significant risk of loss.

35. **List in Table 15 any wild food species for which there is evidence of a significant threat of extinction or of the loss of a number of important populations in your country. Specify the degree of threat according to the classification in use in your country or following the IUCN Red List Categories And Criteria. Include a description of the threat and list references or sources of information if available.**

Table 15. Main threats to wild food species identified as at risk.

Wild food species (scientific name)	Degree of threat	Main threat	References or sources of information if available
Patridge (Perdix perdix)	Category 3 - vulnerable	Species of which the number has dropped between 51 and 75 % and the current number of breeding pairs lies between 5001 and 10.000. Hare and partridge are typical species of the rural area. Habitat degradation: Increasing large-scale agriculture and permanent intensification of agriculture resulting in a loss of biodiversity in the rural area which is negative to the presence of both species in these agro-ecosystems. Other threats include urbanisation, habitat fragmentation and increasing predation pressures.	http://www.nara.be/sites/default/files/ESD_wildbraadproductie.pdf ; http://www.nara.be/sites/default/files/ESD_wildbraadproductie.pdf ; de Tillesse & Bourdouxhe (2006)
European brown hare (Lepus europaeus)		Habitat degradation and intensification of agriculture (destruction of linear vegetation - field margins, embankments, etc., increase in plot sizes, tillage and other use of machinery, adverse effects of certain herbicides / growth regulators / defoliants leading to a simplification of plant communities and even direct toxicity). Bacterial and viral diseases, urbanisation, road traffic, increasing predation pressures (fox, carrion crow)	Bourdouxhe (2012a) ; Bourdouxhe (2012d) ; Bourdouxhe (2013b) ; Bourdouxhe (2013c) ; Bourdouxhe (2014).

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Provide information, where available, as to how the loss of wild food species affects the livelihoods of those that depend on them and on the general impact of their loss on food security and nutrition. Include references to the sources of information, if possible.

Conservation of wild resources used for food

36. **Are any *ex situ* conservation or management activities or programmes established in your country for wild food species? These may include, for example, culture collections, collections of insects, fungi, etc. If so, list these in Table 16.**

Table 16. *Ex situ* conservation or management activities or programmes for wild food species.

Wild food species conserved (scientific name)	Size of collection (number of accessions and quantities)	Conservation conditions	Objective(s)	Characterization and evaluation status
Fresh water fish species		Breeding and re-introduction of fresh water fish species	The main goal is conservation of biodiversity rather than the support of wild food production systems (INBO Centrum voor Visteelt http://www.inbo.be/content/page.asp?pid=DIE_VTE_start)	
Atlantic salmon, sea trout, Crayfish		Breeding and re-introduction of fresh water fish species in Wallonia	The main goal is conservation of biodiversity rather than the support of wild food production systems (CoSMos in Erezée)	
Grayling		Breeding and sustaining of wild population in Wallonia	The main goal is to sustain biodiversity rather than the support of wild food production systems (CoSMos in Erezée)	

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37. **Are any *in situ* conservation and management activities or programmes established in your country that supports maintenance of wild food species? If so list these in Table 17 provide the following information for each activity or program: site name and location, production system(s) involved, conservation objective and specific actions that secure wild food species (if any).**

Table 17. *In situ* conservation or management activities or programmes for wild food species.

Wild food species conserved (scientific name)	Site name and location	Size and environment	Conservation objective(s)	Actions taken
Fresh water fish species	Designated sites and areas		Maintenance of freshwater systems (lakes, rivers, etc.)	Restoration of the free movement of migratory fish

Wild food species conserved (scientific name)	Site name and location	Size and environment	Conservation objective(s)	Actions taken
Forest species			Forest management by the government and private organisations (e.g. Bosgroepen, Natuurpunt,…)	Fishing Quota + Size restrictions, prohibited species
Fisheries policy				Fishing Quota + Size restrictions, prohibited species
Perdrix perdrix, Phasianus colchicus, Lepus europaeus		Agricultural crop area according to expert advice	Improvement of field bird habitats from which recreationally hunted species also benefit	Unharvested crop strips or tall perennial grasses, statements of requirements modified to accommodate field bird conservation objectives depending on the presence of locally-targeted species. Voluntary contracts as part of the Walloon agri-environmental measure programme (Rural Development Programme of the Common Agricultural Policy)

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38. What activities are undertaken in your country to maintain traditional knowledge of wild food species (indicate if the extent to which these have already been described in sector reports)? How can traditional knowledge of wild food species be accessed and used to inform conservation and use decisions?

No information available.

39. Provide any available information on gender dimensions with respect to the maintenance of and knowledge about wild food species. These may include differences in the roles and insights of women and men with respect to harvesting particular resources, monitoring their state, overseeing their ecosystem management.

No information available.

Natural or human-made disasters and biodiversity for food and agriculture

This section collects information on natural or human-made disasters and their impact on and response from biodiversity for food and agriculture as a whole.

40. **Has your country experienced any natural or human-made disaster(s) that has had a significant effect on biodiversity for food and agriculture and/or on ecosystem services in the past 10 years? List in Table 18 those for which any information exists on their effect on biodiversity for food and agriculture and/or ecosystem services. Indicate the effect on different components or services as significant increase (2), increase (1), no change (0), some loss (-1), significant loss (-2), or not known (NK).**

Table 18. Natural or human-made disasters that has had a significant effect on biodiversity for food and agriculture in the past 10 years in the country.

Disaster description	Production system(s) affected (code or name)	Effect on overall biodiversity for food and agriculture (2, 1, 0, -1, -2, NK)	Effect on ecosystem services (2, 1, 0, -1, -2, NK)
Royal Decree of 17 October 1985 classifying the damage to certain arboricultural and fruit crops caused by frost during the winter of 1984-1985 as an agricultural disaster and the definition of the geographical extent of this disaster.	C11	NK	NK
Royal Decree of 18 November 1992 classifying the damage caused by the drought of 1991 to meadows in various communes in the province of Luxembourg as an agricultural disaster and the definition of the geographical extent of this disaster as well as the extent of the damage and its compensation.	L3	NK	NK
Royal Decree of 1 March 1999 classifying the damage caused by the drought of 1996 to meadows in various communes in the provinces of Hainaut, Namur and Luxembourg as an agricultural disaster and the definition of the geographical extent of this disaster as well as the extent of the damage and its compensation	L3	NK	NK
Royal Decree of 9 August 2002 classifying the damage to certain crops caused by heavy rainfall of October and November 2000 in various communes as an agricultural disaster, and the definition of the geographical extent of this disaster as well as its compensation, modified by the Royal Decrees of 9 March 2003 and of 11 July 2003	C11	NK	NK

Disaster description	Production system(s) affected (code or name)	Effect on overall biodiversity for food and agriculture (2, 1, 0, -1, -2, NK)	Effect on ecosystem services (2, 1, 0, -1, -2, NK)
Royal Decree of 11 July 2003 classifying the damage to flax, potato, cereal, field beans and vegetables by the heavy rainfall which took place in September 2001 as an agricultural disaster, and the definition of the geographical extent of this disaster as well as its compensation, modified by the Royal Decree of 13 September 2004	C11	NK	NK
Royal Decree of 28 September 2003 classifying the damage caused to beech trees (Fagus sylvatica) by bark beetles of the species Trypodendron signatum, Trypodendron domesticum and Anisandrus dispar, as well as by Lymexylon Hylecoetus dermestoïds on the territory of certain communes between 1st of January 2000 and 1st of July 2002 as an agricultural disaster, and the definition of the geographical extent of this disaster as well as its compensation	F7	NK	NK
Royal Decree of 8 November 2007 classifying the damage caused by the drought of June and July 2006, followed by heavy rainfall of August 2006 as an agricultural disaster, and the definition of the geographical extent of this disaster as well as its compensation	C11	NK	NK
Royal Decree of 17 March 2013 classifying the damage caused by the drought which took place in the spring of 2011 as an agricultural disaster and the definition of the geographical extent of this disaster as well as its compensation	C11	NK	NK
Bark beetle attacks in the beech forests of southern Wallonia (Ardenne and Gaume) in 2000 and 2001; more than 1,600,000 m3 of beech trees affected causing a reduction in the density of beech trees and potential diversification.	F3	NA	NK

Disaster description	Production system(s) affected (code or name)	Effect on overall biodiversity for food and agriculture (2, 1, 0, -1, -2, NK)	Effect on ecosystem services (2, 1, 0, -1, -2, NK)
Accidental cyanide pollution in the Basse-Sambre region in 2005/2006 and insecticide pollution in the Meuse and Samson rivers in 2008	A3	45 t of dead fish	-2

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41. Briefly summarize any available information, including the year of the disaster, a description of the effects of the disaster on the different components of biodiversity for food and agriculture and/or on the effects on ecosystem services, and references to the supporting documentation.

Mainly the natural disasters officially recognized by the federal authorities and having a severe economic impact on agricultural production have been taken into account in table 18 (list since 1975, see (http://economie.fgov.be/nl/binaries/landbouwrampen_nl_tcm325-35909.pdf).

In addition, there are other natural disasters which have been acknowledged by the Agricultural Disaster Fund for which farmers received a compensation (http://ibz.be/download/natuurramp/Etude%20statistique%20des%20calamitsdepuis%201993%20version%202013septembre.pdf). These is among others the case for storms, heavy rainfall, floodings, hail, tornadoes.

The biodiversity effects on agriculture and food have not yet been examined.
Regarding soil pollution, as part of the Soil Decree, each local soil pollution incident undergoes a risk assessment, including impacts on the ecosystem (ecotoxicological values). However the pollution relating to agricultural and forest environments is non-point source pollution. It is thus not covered here.

Furthermore, certain areas containing high levels of certain pollutants (which sometimes happens in natural areas) can lead to the development of particular species that are also part of a certain biodiversity…

42. **Provide any available evidence from your country that changes in biodiversity for food and agriculture caused by natural or human-made disasters have had an effect on livelihoods, food security and nutrition.**

Since no research has yet been done on changes in biodiversity for food and agriculture caused by natural or human made disasters, there is also no evidence on the effect on livelihoods, food security and nutrition.

43. **Provide any available evidence that the enhanced use of biodiversity for food and agriculture has contributed to improving livelihoods, food security and nutrition in the context of a natural or human-made disasters. Describe and provide source of information.**

Since no research has been done on enhanced use of biodiversity for food and agriculture has contributed to improving livelihoods, food security and nutrition in the context of natural or human made disasters, there is no evidence on this contribution.

44. **Are there invasive alien species identified in your country that have had a significant effect on biodiversity for food and agriculture in the past 10 years? List in Table 19 those for which any information exists on their effect on biodiversity for food and agriculture and/or ecosystem services. Indicate the effect on different components or services as strong increase (2), increase (1), no effect (0), some loss (-1), significant loss (-2), or not known (NK).**

Table 19. Invasive alien species that have had a significant effect on biodiversity for food and agriculture in the past 10 years.

Invasive alien species (scientific name)	Production system(s) affected (code or name)	Effect on components of biodiversity for food and agriculture (2,1,0,-1,-2, NK)	Effect on ecosystem services (2,1,0,-1,-2, NK)
Citrus longhorn beetle Anoplophora spp.	F3, F7, C11	NK	NK
Timberman Monochamus spp	F3, F7, C11	NK	NK
Western Corn Rootworm Diabrotica virgifera	C11	NK	NK
knolcyperus Cyperus esculentus	C11	NK	NK
Egyptian goose Alopochen aegyptiaca	C11	NK	NK
Canadian goose Branta canadensis	C11	NK	NK
Pumpkin ladybird Harmonia axyridis	C7	NK	NK
Muskrat Ondatra zibethicus	C11	NK	NK
Birdcherry tree Prunus serotina	F3, F7	NK	NK
Black locust Robinia pseudoacacia	F3, F7	NK	NK
Corbicula Corbicula sp.	A3	-2	-2
Dreissene Dreissenia sp.	A3	-2	-2
Galician crayfish Astacus leptodactylus	A3, A11	-2	NK
Signal crayfish Pacifastacus leniusculus	A3, A11	-2	NK
American crayfish Orconectes limosus	A3, A11	-2	NK
Louisiana crayfish Procambarus clarkii	A3, A11	-2	NK

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45. Briefly summarize any available information related to the invasive alien species listed in Table 19, including a description of the effects of the invasive alien species on the different components of biodiversity for food and agriculture and/or on the effects on ecosystem services, and references to the supporting documentation.

More and more species are introduced outside their natural geographic range due to the increasing rate of trade in the world. Some of them are able to establish in their new environment and to develop dense populations so they can outcompete native species or disrupt the good functioning of the ecosystem.

The Belgian Forum on Invasive Species (http://ias.biodiversity.be/http://ias.biodiversity.be/) gathers scientific information on presence, distribution, auto-ecology, adverse impacts and management of invasive alien species. It regularly updates a reference list of exotic species in Belgium and is responsible for the elaboration of a black list gathering species with a strong detrimental impact on biodiversity. The nature indicator 'number of invasive plant species and exotic species' (www.natuurindicatoren.bewww.natuurindicatoren.be) shows that the cumulative number of invasive species has been increasing gradually since 1800. Exotic species also occur more and more in rivers. The indicator 'trend fishing in streams and rivers' (www.natuurindicatoren.bewww.natuurindicatoren.be) shows that the number of non-native species such as topmouth gudgeon and round goby has increased. Chinese mitten crab, exotic crayfish and mollusks such as zebra mussels and Asian clams are expanding their habitat. In some forests, exotic species threaten native flora. The shrub layer is overgrown and colonized by e.g. black cherry or other species (e.g. Armenian blackberry, American pokeweed.) However, the impact on the biodiversity for food and agriculture has not yet been studied thoroughly.

An exception and example of an IAS impacting the Belgian agriculture, is the harlequin ladybird or multi-coloured Asian lady beetle (Harmonia axyridis), formerly introduced in Belgium to be used in the biological control of pests, but it has become an invasive species since it is a strong intraguild predator and therefore able to displace native ladybird species (D'Haene et al, 2010).

An early detection tool (www.waarnemingen.be/exoten) has been developed to rapidly alert policy makers and land managers when invasive alien species are notified by the public. The aim is to extend this pilot project to a fully operational early warning system combining existing databases on alien invasive species and including follow-up and report of management actions.
A review of methods that assess the biodiversity and socio-economic impacts of invasive alien species was performed by Stiers, et al. (2014).

46. Has biodiversity for food and agriculture contributed to managing the spread and proliferation or controlling established invasive alien species in your country? If yes, provide information on the invasive alien species involved, the components of biodiversity for food and agriculture and any indication on how the components of biodiversity contributed to managing the spread and proliferation or controlling established invasive alien species in your country. Provide references to the supporting documentation.

The contribution of the biodiversity, in particular for food and agriculture is not specifically studied.
However, it is likely that mixed crops and forests are more resilient to invasions by exotic weeds and pests. This is currently studied through the TREEDIV Project dedicated to the functional importance of tree diversity (http://www.treedivbelgium.ugent.be/).

Similarities, differences and interactions

47. Comment on those aspects with respect to the state, trends and conservation of associated biodiversity or wild food biodiversity in relation to the state, trends and conservation of sector genetic resources. It would be helpful to provide your observations under the following headings:

a. main similarities between associated biodiversity, wild food diversity and the different sectors;
b. major differences between associated biodiversity, wild food diversity and the different sectors;
c. synergies or trade-offs between associated biodiversity, wild food diversity and the different sectors.

The responses should include relevant information on socio-economic, political and cultural dimensions as well as biological ones. Information on the significance of common characteristics, differences, synergies and trade-offs with respect to achieving

food security and nutrition, sustainable production or the provision of ecosystem services should also be provided.

Gaps and priorities

48. With respect to the state, trends and conservation of associated biodiversity and ecosystem services:

a. What are the major gaps in information and knowledge?

b. What are the main capacity or resources limitations?

c. What are the main policy and institutional constraints?

d. What actions are required and what would be the priorities?

a. What are the major gaps in information and knowledge?

Ecosystemservice pollination:

• In order to have insight in the ecosystem service pollination, the presence of (possible) pollinators should be monitored and mapped in more detail. There is no similar map for Flanders (De Bruyn, 2014a).

Wood production:

• There are no recent or detailed data on the expansion of forests in Flanders. There are no data on long-term trends and developments over the past decades available making it impossible to determine trends in availability of certain wood types both for the past and the future. As a result, there is no indication on the future timber production. This can be an important aspect for Flanders to develop a long-term policy on timber production. This would also allow gaining additional knowledge on tree species in relation to climate change.

• The forest reference layer is outdated (2000) and is no longer being updated. The 'boswijzer' (forest indicator) and 'hooggroenkaart' (forest map) provide detailed information on the presence of trees, but do not provide information on the tree species, etc.

• Field experimental study on economic viability and environmental impacts of alternative forest management types (both traditional and innovative) have almost come to a standstill in the Low Countries (Vandekerkhove et al, 2014).

Production energy crop production:

• Assessing the impact of the use of biomass for energy purposes on biodiversity is currently difficult due to knowledge gaps on carbon debt, changes in land use and the level of intake of land area. Moreover, it is not yet clear which crops will exactly be used for energy production (Van Kerckvoorde & Van Reeth, 2014).

Soil fertility:

• There is a need for the monitoring of chemical, physical and biological soil fertility parameters to assess the status and trends of ecosystem services in Flanders (Cools & Van Gossum, 2014).

Regulation water quality:

• There is currently too little information available to assess the limits of this ecosystem service within Belgium. The knowledge needs are situated in the area of exemptions nutrients, water quality objectives, physical processes, ecological processes, temporal and spatial aspects (Vrebos et al, 2014).

Natural pest control:

There are no data available to determine the trends of this ecosystem service, nor of the organisms offering this service.
It is therefore important to examine which current management actions have an impact on the natural enemies (e.g. use of pesticides, mechanical weed control ...) (De Bruyn, 2014b).

Most soil organisms, fungi, insects, bacteria ... which play an important role in the functioning of ecosystems and in the supply of a number of supporting and regulating ecosystem services, are currently not monitored (Demolder et al, 2014).

Pest and Disease Regulation

Although relations between the number and diversity of natural enemies on the one hand, and their different drivers on the other hand, is well studied, much less is known about the actual implementation of the services, being natural pest control. The presence of natural enemies does not necessarily mean that the service is actually delivered.
More information about ecosystem services in Wallonia and Flanders in “Rapport sur les services écosystémiques pour la Wallonie” (2013) and in “Natuurrapport 2014” (INBO, 2014).

b. What are the main capacity or resources limitations?

Financial resources from governments and the dedication of government personnel to do research, monitoring, actions and projects trying to fill the above mentioned gaps are always limited, especially in times of cuts and savings. Therefore priorities have to be taken and choices have to be made by the governments, both federal and regional.

c. What are the main policy and institutional constraints?

No information available.

d. What actions are required and what would be the priorities?

Gaps of information and knowledge arise mainly from unavailable, missing data. They can be found by setting up the appropriate monitoring systems, f.e. monitoring the presence of pollinators of soil organisms, monitoring soil fertility, etc.

49. With respect to the state, trends and conservation of wild resources used for food:

a. What are the major gaps in information and knowledge?
b. What are the main capacity or resources limitations?
c. What are the main policy and institutional constraints?
d. What actions are required and what would be the priorities?

a. What are the major gaps in information and knowledge?

Wild foods: The current range of different wild populations is not known, since the counting of most wild species in Flanders / Belgium is not possible.

As far as almost all wild species are concerned, the relationship between habitat and land use on the one hand and the abundance of game species on the other hand in a highly fragmented landscape as Flanders is not known. The adaptability of different wild species to changing land use types too is largely unknown. Further research is necessary to allow making an estimate of the potential supply.

A better understanding of the impact of the ecosystem services on population dynamics will enable us to assess the durability of these ecosystem services. By gaining understanding of the current prices for the different wild species, both the price received by the hunter as the price paid by the consumer, the assessment could be more accurately monitored.
Figures on the actual import of venison could give insight into the extent to which supply and demand of venison in Flanders are in balance. These figures are unfortunately not available (Scheppers & Casaer, 2014).

b. What are the main capacity or resources limitations?

Financial resources from governments and the dedication of government personnel to do research, monitoring, actions and projects trying to fill the above mentioned gaps are always limited, especially in times of cuts and savings. Therefore, priorities have to be taken and choices have to be made by the governments, federal and regional.

c. What are the main policy and institutional constraints?

No information available.

d. What actions are required and what would be the priorities?

Wild foods: In the field of hunting, guidelines on the joint use of open space by hunters and the public should be developed in

order to reduce conflicts in the future (Scheppers & Casaer, 2014).

50. With respect to the impact and response to natural or human-made disasters and biodiversity for food and agriculture:
    a. What are the major gaps in information and knowledge?
    b. What are the main capacity or resources limitations?
    c. What are the main policy and institutional constraints?
    d. What actions are required and what would be the priorities?

No information available.

51. **With respect to the impact of invasive alien species on biodiversity for food and agriculture:**
    a. What are the major gaps in information and knowledge?
    b. What are the main capacity or resources limitations?
    c. What are the main policy and institutional constraints?
    d. What actions are required and what would be the priorities?

a. What are the major gaps in information and knowledge?

Major gaps are the lack of information available on invasive soil species, the lack of scientifically based risk assessments and the lack of horizon scanning to assess new invasive species.

b. What are the main capacity or resources limitations?

Financial resources from governments and the dedication of government personnel to do research, monitoring, actions and projects trying to fill the above mentioned gaps are always limited, especially in times of cuts and savings. Therefore, priorities have to be taken and choices have to be made by the governments, both federal and regional.

c. What are the main policy and institutional constraints?

The main policy and institutional constraints are the absence/prohibition of trade restrictions, no structural rapid response for new invasive species, no structural monitoring of invasive species and customs control on priority pathways. However, the situation is likely to change rapidly through the implementation of the new European 2014/1143 Regulation.

d. What actions are required and what would be the priorities?

Taking into account the capacity and resource availability of the governments, priorities could be trade restrictions (within the rules of the European internal market), more structured monitoring and the creation of a rapid response team. An increase of functional diversity within agricultural and forest production systems together with a reduction of nutrient input should be also prioritized to increase their resiliency to invasive alien species.

CHAPTER 4: The state of use of biodiversity for food and agriculture

Proposed structure of the chapter and information to be included in the Country Reports

The questions in this chapter seek to obtain information on:

- The contribution of biodiversity for food and agriculture to:
  - production (or provisioning ecosystem services) and especially to food security and nutrition and to rural poverty reduction;
  - supporting and regulating ecosystem services;
  - sustainability and resilience;
- The application of an ecosystem approach;
- The state of the sustainable use of biodiversity for food and agriculture.

Since the sectoral State of the World reports already presented or in preparation provide information separately on the use of animal, aquatic, forest and plant genetic resources, the responses here should provide available information on:

- The combined use of genetic resources coming from different sectors;
- Synergies between genetic resources of the different sectors
- The use of all types of associated biodiversity, either as separate components or in combination;
- The use of wild foods and, where information exists, other important wild harvested products.

The uses of biodiversity for food and agriculture can include:

- The direct use of genetic resources from different sectors or of associated biodiversity and wild foods, individually or in combination;
- The indirect use through the provision of supporting and regulating ecosystem services;
- The support for land/water restoration or other land/water management objectives;
- The support of cultural ecosystem services including:
  - Use for cultural, amenity or social reasons;
  - Use in education or scientific research.

To help reporting and provide a common framework for analysis of Country Reports a set of biodiversity maintaining management practices and diversity based practices have been identified in Annex 5 and Annex 6. These provide a framework for a number of the questions in this Chapter.

The information provided for this Chapter should also cover the adoption of an ecosystem approach. One such approach has been developed under the Convention on Biological Diversity and comprises 12 principles.

A final section of this Chapter of the Country Report should address the sustainable use of different components of biodiversity for food and agriculture, wild foods and other wild harvested products.

Where information is available, comment on the different roles played by men and women in the use of genetic resources, use and consumption of wild foods and knowledge over local ecosystems.

The use of management practices or actions that favor or involve the use of biodiversity for food and agriculture

This section looks for information on the extent to which biodiversity maintaining management practices and diversity based practices are in use in your country.

52. **For each of the production systems present in your country indicate in Table 20 the extent of use of management practices that are considered to favor the maintenance and use of biodiversity for food and agriculture.**

In the table indicate the percent of total production area or quantity under the practice (where known), changes that have occurred over the last 10 years in the production area or quantity under the practice (significant increase (2), some increase (1), no change (0), some decrease (-1), significant decrease (-2), not known (NK), not applicable (NA)),

and any identified change in biodiversity for food and agriculture associated with the practice (strongly increasing (2) increasing (1), stable (0) decreasing (-1), strongly decreasing (-2), not known (NK), not applicable (NA)).

Table 20. Management practices that are considered to favor the maintenance and use of biodiversity for food and agriculture.

Production systems	**Management practices** (Place pointer on the management practice name for a description)	**Percent of production area or quantity under the practice (%)**	**Change in production area or quantity under the practice (2,1,0,-1,-2, NK, NA)**	**Effect on biodiversity for food and agriculture (2,1,0,-1,-2, NK, NA)**
Livestock grassland-based systems: Temperate	Integrated Plant Nutrient Management (IPNM)	70 (use of (artifi	1	-1
	Integrated Pest Management (IPM)	Is supposed to	NK	NK
	Pollination management	1	1	2
	Landscape management	50 (grasslands	0	2
	Sustainable soil management practices	10 (liming, orga	1	1
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	NK (drainage, w	0	NK (Wallonia: el
	Agroforestry	<1 Wallonia: pl	1	2 Wallonia: -1 (c
	Organic agriculture	Area: 1% in Flar	1	1/2
	Low external input agriculture	>10 (on grassla	1	2
	Home gardens	NK	NK	NK
	Areas designated by virtue of production features and approaches	<1	0	0
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	NA	NA	NA
	Reduced-impact logging	NA	NA	NA
	Other [*please specify*]:			
Livestock landless systems: Temperate	Integrated Plant Nutrient Management (IPNM)	NA	NA	NA
	Integrated Pest Management (IPM)	NA	NA	NA
	Pollination management	NA	NA	NA
	Landscape management	Integration of s	0	NK
	Sustainable soil management practices	NA	NA	NA
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	NK	NK	NK
	Agroforestry	NA	NA	NA
	Organic agriculture	0.03% of the pi	0 (pigs), +1 (po	NA
	Low external input agriculture	NK	NK	NK

	Home gardens	NK	NK	NK
	Areas designated by virtue of production features and approaches	NK	NK	NK
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	NA	NA	NA
	Reduced-impact logging	NA	NA	NA
	Other [*please specify*]: Flanders: Since 2003, new pig stables and poultry stables have to be built by using one of the approved housing systems for ammonia reduction. It is estimated that 25.37% the pigsties built in 2009, are innovative stables reducing ammonia emission. Moreover, 6.23% of the pigsties built in 2009, are equipped with an end-of-pipe air conditioning technology (biological and chemical scrubbers). In total, 31.60% of all pig farms can be considered to be "stables reducing ammonia emission". With regard to the poultry industry, it estimated that 24.65% of all poultry stables built in 2009 reduce the emission of ammonia. For bovine animals, there are no stables reducing the ammonia emission (Deutsch et al, 2013).	Stables reducin	1	NK
Naturally regenerated forests: Temperate	Integrated Plant Nutrient Management (IPNM)	0	NA	NA
	Integrated Pest Management (IPM)	0 The use of pe	NA	NA
	Pollination management	0	NA	NA
	Landscape management	NK	NK	NK
	Sustainable soil management practices	All soils?	1	NK
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	Hydromorphic	1	NK
	Agroforestry	NA	NA	NA
	Organic agriculture	NA	NA	NA
	Low external input agriculture	0	NA	NA
	Home gardens	NA	NA	NA

	Areas designated by virtue of production features and approaches	97%	1	NK
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	NA	NA	NA
	Reduced-impact logging	3% of strict nat	1	NK
	Other [*please specify*]:			
Planted forests: Temperate	Integrated Plant Nutrient Management (IPNM)	0 but research	NA	NA
	Integrated Pest Management (IPM)	0 The use of pe	NA	NA
	Pollination management	0	NA	NA
	Landscape management	NK	NK	NK
	Sustainable soil management practices	All soils	1	NK
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	Hydromorphic	1	NK
	Agroforestry	NA	NA	NA
	Organic agriculture	NA	NA	NA
	Low external input agriculture	NA	NA	NA
	Home gardens	NA	NA	NA
	Areas designated by virtue of production features and approaches	97%	1	NK
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	NA	NA	NA
	Reduced-impact logging	0	NA	NA
	Other [*please specify*]:			
Self-recruiting capture fisheries: Temperate	Integrated Plant Nutrient Management (IPNM)	NA	NA	NA
	Integrated Pest Management (IPM)	NA	NA	NA
	Pollination management	NA	NA	NA
	Landscape management	NK	NA	NA
	Sustainable soil management practices	NA	NA	NA
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	NA	NA	NA
	Agroforestry	NA	NA	NA
	Organic agriculture	NA	NA	NA
	Low external input agriculture	NA	NA	NA
	Home gardens	NA	NA	NA
	Areas designated by virtue of production features and approaches	NA	NA	NA

	Ecosystem approach to capture fisheries	Flemish action	NK	NK
	Conservation hatcheries	ILVO: Aquacult	NK	NK
	Reduced-impact logging	NA	NA	NA
	Other [*please specify*]:			
Fed aquaculture: Temperate	Integrated Plant Nutrient Management (IPNM)	NA	NA	NA
	Integrated Pest Management (IPM)	NA	NA	NA
	Pollination management	NA	NA	NA
	Landscape management	NK	NA	NA
	Sustainable soil management practices	NA	NA	NA
	Conservation agriculture	NA	NA	NA
	Water management practices, water harvesting	100%	1	2
	Agroforestry	NA	NA	NA
	Organic agriculture	NA	NA	NA
	Low external input agriculture	NA	NA	NA
	Home gardens	NA	NA	NA
	Areas designated by virtue of production features and approaches	NA	NA	NA
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	Pool of 1,75 ha	1	2
	Reduced-impact logging	NA	NA	NA
	Other [*please specify*]:			
Rainfed crops : Temperate	Integrated Plant Nutrient Management (IPNM)	Is supposed to	1	1
	Integrated Pest Management (IPM)	Is supposed to	1	1
	Pollination management	2 (mainly fruit	1	2
	Landscape management	30	0 Wallonia : 1	2
	Sustainable soil management practices	Wallonia : 90 (la	1	Wallonia : 0
	Conservation agriculture	<5	1	NK
	Water management practices, water harvesting	NK	NK	NK
	Agroforestry	<1	1	2
	Organic agriculture	Area: 1% in Flar	1	1
	Low external input agriculture	<1	0	NK
	Home gardens	NK	NK	NK
	Areas designated by virtue of production features and approaches	NK	NK	NK
	Ecosystem approach to capture fisheries	NA	NA	NA
	Conservation hatcheries	NA	NA	NA

	Reduced-impact logging		NA	NA	NA
	Other [*please specify*]:	Pollination: In the Belgian context, especially fruit and vegetables, ornamental flowers and some seed crops depend on insect pollination. The financial value of pollination by honey bees in Belgium and Luxembourg is being estimated at € 316 million. The importance of pollination by honeybees cannot be overestimated in the fruit sector. Certain crops such as apples and cherries are almost entirely dependent on pollinators. The honeybees and bumblebees which currently pollinate crops on Flemish soil, searching for nectar and pollen, are deliberately deployed by farmers and horticulturists and by beekeepers. But wild bees, wild bumblebees and hoverflies also contribute considerably to the pollination of crops. On a local basis, they do somewhat buffer the effects on pollination caused by the decreasing number of pollinators. Moreover, wild related species also contribute to the conservation of the genetic diversity within species (D'Haene et al, 2010).			
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	Integrated Plant Nutrient Management (IPNM)				
	Integrated Pest Management (IPM)				
	Pollination management				
	Landscape management				
	Sustainable soil management practices				
	Conservation agriculture				
	Water management practices, water harvesting				

	Agroforestry			
	Organic agriculture			
	Low external input agriculture			
	Home gardens			
	Areas designated by virtue of production features and approaches			
	Ecosystem approach to capture fisheries			
	Conservation hatcheries			
	Reduced-impact logging			
	Other [*please specify*]:			

Provide or cite references to any documentary evidence that exists to support the evaluation given above. Indicate where practices used in a production system are affecting biodiversity for food and agriculture in another production system.

Where evidence exists of an effect of any of these practices on biodiversity for food and agriculture, provide a brief summary of the effect, the components of biodiversity for food and agriculture affected, and available indicators. Include any available references or reports.

53. **For each of the production systems present in your country indicate in Table 21 the extent of use of diversity based practices that involve the use of biodiversity for food and agriculture.**

In each table indicate the percent of total production area or quantity under the practice (where known), changes in the production area or quantity under the practice that have occurred over the last 10 years (strongly increasing (2), increasing (1), stable (0) decreasing (-1), strongly decreasing (-2), not known (NK)) and any identified change in biodiversity for food and agriculture associated with the diversity based practice (strongly increasing (2) increasing (1), stable (0) decreasing (-1), strongly decreasing (-2), not known (NK)).

Table 21. Diversity based practices that involve the enhanced use of biodiversity for food and agriculture.

Production systems	**Diversity based practices** (Place pointer on the diversity based practice name for a description)	**Percent of production area or quantity under the practice (%)**	**Change in production area or quantity under the practice (2,1,0,-1,-2, NK, NA)**	**Effect on biodiversity for food and agriculture (2,1,0,-1,-2, NK, NA)**
Livestock grassland-based systems: Temperate	Integrated Plant Nutrient Management (IPNM)	Items in previou	NK	NK
	Integrated Pest Management (IPM)	Base broadenin	NK	NK
	Pollination management	Domestication;	0	NK
	Landscape management	Maintenance o	0	2
	Sustainable soil management practices	Restoration pra	1	1
	Conservation agriculture	Management o	NK	NK
	Water management practices, water harvesting	Polyculture/aqu	NA	NA
	Agroforestry	Swidden and sl	0	0

	Organic agriculture	Enriched forest	NA	NA
	Low external input agriculture	Other: /		
Livestock landless systems: Temperate	Diversification	NK	NK	NK
	Base broadening	NK	NK	NK
	Domestication	NK	NK	NK
	Maintenance or conservation of landcape complexity	NA	NA	NA
	Restoration practices	NA	NA	NA
	Management of microorganisms	NA	NA	NA
	Polyculture/Aquaponics	NA	NA	NA
	Swidden and shifting cultivation agriculture	NA	NA	NA
	Enriched forests	NA	NA	NA
	Other [*please specify*]:			
Naturally regenerated forests: Temperate	Diversification	--100	1	NA
	Base broadening	NA	1	NA
	Domestication	NA	NA	NA
	Maintenance or conservation of landcape complexity	NK	1	NA
	Restoration practices	NK	1	1
	Management of microorganisms	NK	NK	NK
	Polyculture/Aquaponics	NA	NA	NA
	Swidden and shifting cultivation agriculture	NA	NA	NA
	Enriched forests	NK	NK	NK
	Other [*please specify*]:			
Planted forests: Temperate	Diversification	-- 100	1	NA
	Base broadening	NK	1	NA
	Domestication	NA	NA	NA
	Maintenance or conservation of landcape complexity	NK	1	NA
	Restoration practices	NA	1	1
	Management of microorganisms	NK	NK	NK
	Polyculture/Aquaponics	NA	NA	NA
	Swidden and shifting cultivation agriculture	NA	NA	NA
	Enriched forests	NK	NK	NK
	Other [*please specify*]:	NA	NA	NA
Self-recruiting capture fisheries: Temperate	Diversification	NK	NK	NK

	Base broadening	NK	NK	NK
	Domestication	NA	NA	NA
	Maintenance or conservation of landcape complexity	NA	NA	NA
	Restoration practices	NK	NK	NK
	Management of microorganisms	NK	NK	NK
	Polyculture/Aquaponics	NK	NK	NK
	Swidden and shifting cultivation agriculture	NA	NA	NA
	Enriched forests	NA	NA	NA
	Other [*please specify*]:			
Fed aquaculture: Temperate	Diversification	NA	NA	NA
	Base broadening	NA	NA	NA
	Domestication	NA	NA	NA
	Maintenance or conservation of landcape complexity	NA	NA	NA
	Restoration practices	NA	NA	NA
	Management of microorganisms	NA	NA	NA
	Polyculture/Aquaponics	0%	0	0
	Swidden and shifting cultivation agriculture	NA	NA	NA
	Enriched forests	NA	NA	NA
	Other [*please specify*]:			
Rainfed crops : Temperate	Diversification	NK	NK	NK
	Base broadening	NK	NK	NK
	Domestication	<1 (experiment	0	NK
	Maintenance or conservation of landcape complexity	30 (commitmer	0	2
	Restoration practices	5	1	2
	Management of microorganisms	<1	NK	NK
	Polyculture/Aquaponics	NA	NA	NA
	Swidden and shifting cultivation agriculture	0	0	0
	Enriched forests	NA	NA	NA
	Other [*please specify*]:			
Mixed systems (livestock, crop, forest and /or aquatic and fisheries): Temperate	Diversification			
	Base broadening			
	Domestication			

	Maintenance or conservation of landcape complexity			
	Restoration practices			
	Management of microorganisms			
	Polyculture/Aquaponics			
	Swidden and shifting cultivation agriculture			
	Enriched forests			
	Other [*please specify*]:			

Briefly summarize the information that exists on the effect of the diversity based practice on different components of biodiversity for food and agriculture. Indicate where practices used in a production system are affecting biodiversity for food and agriculture in another production system. Include any available references or reports to support the evaluation given above.

54. **List and briefly describe any specific programmes or projects that have been undertaken in the country to support any of the practices listed in Table 20 and Table 21. Provide information where available on what types of activities were supported, areas and numbers of farmers, pastoralists, forest dwellers and fisherfolk involved, state and outcome with respect to components of biodiversity for food and agriculture.**

Management practices:

• Integrated pest management (IPM): In 2014, new rules for crop protection were introduced in the framework of a European directive on the sustainable use of pesticides. The implementation of an Integrated Pest Management (IPM) is mandatory. All professional users of plant protection products have to apply the principles of IPM since 1st January 2014. The Practical Guide on crop protection gives advice to farmers and growers on how to meet the requirements and contains useful tips for efficient crop protection by minimizing the burden on the environment at the same time.
- Flanders: http://lv.vlaanderen.be/nlapps/docs/default.asp?id=129.
- Wallonia: http://agriculture.wallonie.be/apps/spip_wolwin/article.php3?id_article=392

• Landscape management: The regional governments support the construction and maintenance of small landscape elements next to grasslands, a.o. through the rural development programs. A dedicated Walloon programme exists that depends on the Ministry of Nature Conservation for subsidies for planting and maintaining hedgerows, orchards and tree avenues (http://environnement.wallonie.be/dnf/dcnev/consnat/Subventions_haies.htm).
Moreover, in Flanders the landscape integration of stables is being stimulated.
Organic farming: Organic farming uses reduced tillage practices, green manure, crop diversification and crop rotation, etc. Those farms have an enhanced biodiversity and soil biodiversity. The Strategic Plan Organic Agriculture 2013-2017 aims at achieving a sustainable quality growth of the production of organic crops in Flanders. http://lv.vlaanderen.be/nl/voorlichting-info/publicaties/biologische-landbouw/strategisch-plan-biologische-landbouw-2013-2017. Within this Strategic Plan, large financial efforts are put into specific research needs for the organic sector, as well as support and facilitation of the step to start with organic farming (advice, development of the organic food chain, etc.).http://lv.vlaanderen.be/nl/voorlichting-info/publicaties/biologische-landbouw/strategisch-plan-biologische-landbouw-2013-2017. The Walloon Region has been supporting the development of organic farming for many years, which has meant the agricultural area dedicated to this production method has quadrupled over the last 15 years. In 2013, a new strategic plan was adopted by the Walloon Government to pursue this initiative until 2020. The full document, including 30 presentations of actions relating to the plan's key focus areas, namely regulation, research, training, and promotion, is accessible at the following address: http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/plan_bio_final_juin_2013.pdf

• Agroforestry: Research and implementation of agroforestry is (financially) supported
- Flanders: www.agroforestryvlaanderen.be;
- Wallonia: http://www.reseau-pwdr.be/media/319900/130712_carnet_n2_agroforesterie.pdf.

• The Flemish Action Plan ‘Selective fishing creates life’ aims at making the fishery sector more sustainable and increasing the selectivity of the fishing (http://lv.vlaanderen.be/nlapps/docs/default.asp?fid=527).

• Research Institute for Nature and Forest (INBO) activity: Aquaculture in support of annual restoration- and stocking programs:

Every year there are a few ecologically important native fish species that are cultured at the research centre of the Institute in Linkebeek to support the annual restoration- and stocking programs of the Flemish Community. Most of these species are not cultured by private farmers because of low profit (cannibalism, slow growth, restricted market, etc.) or because of the limited know-how (http://www.inbo.be/content/page.asp?pid=EN_FAU_FIS_CI_CULT)

• Pollination management: Federal Bee Plan 2012-2014 (see nr No. 66).

• Sustainable soil management practices: Certain agro-environmental measures from the rural development programs aim at stimulating sustainable soil management practices.

• Water management practices, water harvesting: The rural development program supports the investments in water storage systems and water treatment and recycling. Also the river basin management plans of the Water Framework Directive have the objective of a good ecological and chemical condition of the surface waters.

• Low external input agriculture: In certain regions in or close to natural areas, the maximum application of fertilizers is limited.

• The Flemish rural development program supports the construction of stables with low emissions of ammonia and the installation of storage systems for fertilizers.

• In Flanders, every year, a number of demonstration projects (average of about 10 projects per year having budgets between 50,000 and 100,000 euros each) are approved and financially supported. These projects are executed by the agricultural research centers, recognised as a 'center for sustainable agriculture' by the Flemish authorities. The goal of demonstration projects is to show to the farmers how to use or implement new techniques, new rules or for example new equipment turning the best agricultural practices more sustainable. Every year, in the research call are defined the themes in which the project proposal has to fit in. The call of 2014 had 4 projects approved on soil fertility, 3 projects on biological plant protection and 1 project on the greening measures. The call of 2013 resulted amongst others in 3 projects on the protection of surface water and 1 project on the implementation of the conservation goals on a farm. The 2012 call focussed on 5 projects demonstrating the implementation of IPM on the agricultural practices.

• In Wallonia, restoration of valley floors, peat bogs, oligotrophic meadows and calcareous grasslands as part of the Life projects

• In Wallonia, the 2008 Forestry Act includes provisions on the maintenance and development of well-structured external forest edges and strict nature reserves. In addition, the Natura 2000 funding system imposes tiered edges along mountain ranges and encourages forest owners to increase the width of these edges with financial incentives.

Diversity based practices:

• Diversification: Breeding and re-introduction of fresh water fish species by the Research Institute for Nature and Forest INBO (INBO, Flanders) and the Walloon Fisheries Service in Erezée (CoSMos - Conservatoire du Saumon Mosan), Achouffe and Emptinne (Wallonia). The goal is conservation of biodiversity rather than the support of wild food production. (http://www.inbo.be/content/page.asp?pid=EN_FAU_FIS_CI_CULT)

• Conservation of landscape complexity: This is stimulated by agro-environmental schemes (AES) of the rural development programme, and regulated in legislation. The rural development programme promotes the creation and maintenance of hedges, tree lines, species-rich field margins, etc. and legislation requires permits for landscape elements to be altered or removed. Effects on biodiversity for food and agriculture through these practices are unknown.

• Domestication: At the Institute for Agricultural and Fisheries Research (ILVO, Flanders), plant breeding programs involve mainly grass and pasture species: Lolium perenne, Lolium multiflorum, Phleum pratense, Festuca pratensis, Trifolium pratense, Trifolium repens. Dozens of new varieties of these species, especially of Lolium perenne and Lolium multiflorum, have been tested and/or bred by ILVO and introduced in farming systems across Europe.

• Forestation and reforestation: The government has adopted multiple measures for stimulating forestation and reforestation (http://www.natuurenbos.be/nl-BE/Natuurbeleid/Bos/Subsidies/Herbebossing_en_bebossing.aspx).

• The greening of the CAP aims at stimulating agricultural practices beneficial for the climate and the environment. The 3 basic measures foreseen are maintaining permanent grassland, crop diversification and maintaining an "ecological focus area".

• In Wallonia, the seed bank of the Nature and Forest Department (Département de la Nature et des Forêts) aims to promote species and genetic diversification in forests. In its work, measures are taken with seeds and seedlings to encourage genetic diversity. A Dictionary of advisable provenances for silviculture is applicable.

• In Wallonia, a network of conservation fruit orchards has been established: conservation programmes for historic varieties so that this diversity is not lost. For nearly thirty years, the work of the RGF (fruit tree genetic resources) laboratoryon fruit tree genetic resources has involved the collection, conservation, assessment and promotion of historic fruit varieties. The department's collection of historic varieties currently boasts 3.,160 listings, including around 1.,600 apple varieties, 1,.030 pear varieties and 340 plum varieties. The number and originality of its contents make the collection one of the largest in Europe. Selection criteria include resistance to disease and pests and the originality of the fruit, etc. Over the past six years or so, several collaborations have led to the creation or restoration of twenty orchards in the interests of biodiversity conservation. The area covered is around 42 hectares. http://www.cra.wallonie.be/fr/19/les-projets/181 et http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/Gal-Vergersbrochure.pdf.

Sustainable use of biodiversity for food and agriculture

Sustainable use of biodiversity for food and agriculture ensures its utilization in ways that do not compromise its continuing availability and its use by future generations. Sector reports will provide information on sustainable use of the different sector genetic resources. Here the focus is therefore on associated biodiversity and on wild foods.

55. **What are the major practices in your country that negatively impact associated biodiversity and/or wild foods? Answers can be provided in Table 22 where examples of general types of practices are listed.**

Table 22. Major practices that negatively impact associated biodiversity and/or wild foods in the country.

Types of practices	Major practice (Y/N)	Description	Reference
Over-use of artificial fertilizers or external inputs	Y	Impact on soil biodiversity in agricultural soils.	Cools & Van Gossum, 2014
Over-use of chemical control mechanisms (e.g. disease control agents, pesticides, herbicides, veterinary drugs, etc.)	Y	Impact on soil biodiversity in agricultural soils. Impact on pollinators and habitats of pollinators.	Cools & Van Gossum, 2014 De Bruyn, 2014a
Inappropriate water management	N	Impact of drainage on soil fertility.	Cools & Van Gossum, 2014
Practices leading to soil and water degradation	Y	Frequently ploughing, overfertilizing, the use of heavy agricultural machinery … leading to soil erosion, soil compaction, nutrient leaching, reduced carbon content of the soils, etc. This also has an impact on the quality of the marine environment.	Cools & Van Gossum, 2014 www.biodiv.be
Over-grazing	N	The Flemish manure decree sets out all the conditions farmers and horticulturists in Flanders must meet regarding the production and processing of manure, the fertilization of arable land as well the transport and storage of fertilizers.	Flemish decree of 22 December 2006 regarding water protection against nitrate pollution caused by agriculture. Also see the implementing decrees.

Uncontrolled forest clearing	N	Forest clearing in Flanders is subject to prior authorization. Forest clearing is regulated in Wallonia (5 ha max of conifers and 3 ha max of deciduous trees in a single section)	The forest decree of 13 June 1990 and Decision of the Flemish Government of 16 February 2001 establishing the compensation rules regarding forest clearing and derogation to the prohibion on forest clearing In "Decree of 15 July 2008 on the Forestry Act, Art. 38"
Fishing in protected areas	N		
Overharvesting	N	Fisheries: limited by EU fish quota Fungi: prohibition to cut in Flanders	It is prohibited to remove caught eels in Wallonia Flemish legislation: Forest decree, Nature decree, Species decree
Other [*please specify*):	N		

Add row

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Please comment on the reasons why the practices are in use and discuss if trade-offs are involved.

56. **Briefly describe any actions and countermeasures taken to limit unsustainable use and/or support sustainable use of associated biodiversity and/or wild foods.**

• Legislation and standards for fertilizer and pesticide application, erosion control, conservation of permanent grasslands, cross compliance, etc. Moreover, agro-environment measures of the rural development program stimulate practices that go further than regulatory requirements concerning the use of fertilizers and pesticides, erosion control, biodiversity-based practices, the provisioning of habitats for specific species, etc.

• From 2014, the application of integrated pest management (IPM) is mandatory for all professional users of pesticides.

• Marine fishing: Stimulation of the conversion of conventional fishing techniques (e.g. trawling) to more sustainable techniques. The Institute for Agricultural and Fisheries Research (ILVO) does research on these topics.

• Organic agriculture: Organic agriculture more frequently applies practices of reduced tillage, use of green manures, and has a more diverse crop rotation. Government supports organic agriculture, a.o. through the rural development program and the Flemish and Walloon strategic plans for organic agriculture. (http://lv.vlaanderen.be/nlapps/data/docattachments/strategisch-plan-bio-2013.pdf and http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/plan_bio_final_juin_2013.pdf).

• Collecting wild foods from forests or public domain without permission is forbidden, it is considered as poaching. The Flemish nature decree (1997) stipulates that:
- it is forbidden in nature reserves to deliberately pick plants, to collect, cut, uproot or destroy or plants or vegetation in any way;
- a measure prohibiting the picking, collecting, cutting, uprooting or destruction of plants can be taken in certain areas or habitats or anywhere;

- the Flemish government is empowered to take measures in order to lay down rules or to prohibit the following activities on a temporary or permanent basis for a limited area or for the entire territory: the possession for personal or commercial purposes, the capture, killing, abducting or the use of certain means of capture and killing, collecting, removal or destruction, the marketing, the exchange, the offering for sale or exchange, the promise to purchase, transport and import or export of any organism, living or dead, or any easily recognizable parts of organisms or derivatives thereof.

• It should be noted thatT the Walloon government Decree of 12 May 2011 prohibits the sale of and thus limits the supply for final consumption of any dead bird as well as any part or product obtained from the said easily identifiable bird, if the bird in question belongs to one of the following species: European woodcock, Canada goose, Eurasian coot and Eurasian teal. In practice, only consumption by the hunter him/herself or the transfer of these products by the hunter to a third party for personal consumption is permitted.

• Various decrees in application of the Law on river fishing of 1st July 1954 (AERW and governmental orders of 11.03.1993 and , AGW of 28.02.2002) limit the removal of certain fish species in demographic difficulty. A draft new decree further restricts the removal of fish caught in Wallonia.

57. **Provide in Table 23 any information available that lack of biodiversity for food and agriculture is limiting food security and nutrition, and/or rural livelihoods in the different production systems in your country. Indicate the production systems affected together with any information on the extent of problem (significant lack (2), some lack (1)), describe the effects on livelihood, food security and nutrition, and the components of biodiversity for food and agriculture that are limited.**

Table 23. Effect of the lack of biodiversity for food and agriculture on production, food security and nutrition and livelihood.

Production system	Biodiversity component for which diversity is lacking	Extent of problem (2,1)	Effect on food security and nutrition	Effect on livelihood	Reference
A3	Migratory fish (salmon, sea trout, sturgeon, flounder, shad, etc.)	1	Having died out regionally, these species can no longer be fished or eaten.	Sources of long-chain n-3 fatty acids having a role in preventing various heart conditions, blood vessels...	

Add row

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The contribution of biodiversity for food and agriculture to improving productivity, food security and nutrition, livelihoods, ecosystem services, sustainability, resilience and sustainable intensification

This section looks for information on the direct contributions of biodiversity for food and agriculture to improving productivity, food security and nutrition, livelihoods, ecosystem services, sustainability, resilience and sustainable intensification. It is concerned specifically with the combined use of genetic resources coming from different sectors, the use of all types of associated biodiversity, the use of wild foods and, where information exists, other important wild products.

Note the ways in which biodiversity for food and agriculture contributes to food security and nutrition, livelihoods, ecosystem services, sustainability, resilience and sustainable intensification are often linked. Answers to the requests for information below may therefore be combined.

58. **Where available, provide information that increasing the amount of biodiversity for food and agriculture, including associated biodiversity, in production systems in your country have improved the following:**

a) productivity;
b) food security and nutrition;
c) rural livelihoods;
d) ecosystem services;
e) sustainability;
f) resilience;
g) sustainable intensification.

What specific actions have you undertake to strengthen the contribution of biodiversity for food and agriculture to improving these outcomes? For each of these aspects, briefly describe the nature and scale of the actions implemented, the production systems involved, and the outcomes, results obtained or lessons learned from these actions.

Where available provide information on the components of biodiversity for food and agriculture involved, the stakeholders involved and the gender aspects of these actions. Note that information on policies, legislation or regulations should be reported in Chapter 5 and your response here should be concerned with interventions at production system level.

a. Productivity

Production of venison: Open spaces in the forest lead to more variety in the ecosystem. They also provide food for deer. Edges of arable lands have a positive impact on biodiversity and act as breeding habitat for partridges (Scheppers & Casaer, 2014).
Wood production: Research has shown that mixed forests and well-structured forests in general are more resistant to storm damage and biotic degradation than monoculture forests. In the long term, this will lead to a lower frequency and intensity of damage and, as a consequence, to a higher productivity.
A management plan establishing the combination of well-structured forests with permanent and non-permanent light-filled spaces and a lot of dead wood and habitat trees, offers great opportunities to ensure preservation and development of biodiversity together, while maintaining and even increasing the supply of timber. The integration can take place at the forest level but also at the landscape level (Vandekerkhove et al, 2014).

b. Food security and nutrition

There is no information available for Belgium.

c. Rural livelihoods

Many studies have shown that the average citizen/ tourist has a higher appreciation for a more green landscape. This applies both to the urban area where parks are much appreciated as to the countryside, where forests and small landscape elements (such as rows of trees, hedges ...) are much more appreciated than a 'bare' open landscape.
Wallonia's and Flanderss agri-environmental programmes brings income to farmers who provide an environmental service in developing and maintaining the ecological network and habitats of high biological value especially in Natura 2000 areas. The average amount paid to farmers in 2013 for this type of service was 2,800 euros.

d. Ecosystem services

Some permaculture pioneers produce food while preserving ecosystems and biodiversity by mixed cropping systems.
The extensification of timber harvesting (e.g. no clearcuts) and transformation of very highly productive conifer forests to mixed forests leads to less acidification and leaching resulting in a (limited) water quality improvement (Vandekerkhove et al, 2014).
Research has shown that the edges of arable land, such as perennial grass edges and flower borders, do host several natural enemies and also attract bees. They therefore promote the ecosystem services natural pest control and pollination (Temmerman et al, 2012).
It has been shown that some environmental measures effectively increase the service of supporting biodiversity in the agricultural ecosystem. This was demonstrated for meadows of high biological value (various assessments as part of the EVAGRI project), impact on butterflies, case study on whinchats (Saxicola rubetra) and impact on endangered field flowers (http://www.reseau-pwdr.be/media/661012/2013_pub_evaluation_mae_wallonie.pdf).

e. Sustainability

There is no information available for Belgium.

f. Resilience

Wood production: Research has shown that mixed forests and well-structured forests in general are more resistant to storm damage and biotic degradation than monoculture forests. In the long term, this will lead to a lower frequency and intensity of damage and, as a consequence, to a higher productivity (Vandekerkhove et al, 2014).

g. Sustainable intensification

There is no information available for Belgium.

59. **Do you have information on the proportion of the population in your country that uses wild food on a regular basis for food and nutrition? If available, include information such as the proportion of the diet that is collected from the wild in normal time and in times of scarcity, drought, natural and human-made disaster, and the degree to which wild foods are used (for subsistence, supplementing, nutrition, other).**

Provide explanations and additional information as regards the gender differences in the patterns of use, management and consumption of wild food, including data disaggregated by sex.

Venison: In Flanders, almost 12,000 hunters have a hunting permit licence allowing them to hunt game (Scheppers & Casaer, 2014). In Wallonia, around 16,000 hunting licence-holders renew their license licence each year. This licence gives them permission to shoot game animals for one year, in accordance with hunting legislation. Game is either sold or consumed by the hunters, their hunting assistants (guards, trackers, etc.) or their close relatives. No data isare available on the amount of game that is shot, sold and delivered to consumers through restaurants or food distribution sectors. A university thesis on the economic impact of hunting in Wallonia (C. Delwasse, 2004) estimated this to amount to 75-80% of the total shot, for big game only (deer, roe deer and wild boar mainly). As an indication, on average 40-45,000 big game animals are shot annually. No data isare available on the amount of hunters eating the game they shoot themselves. Nevertheless, the amount of wild game shot in Wallonia in our population's food is quite negligible overall.

No data are available on the proportion of the population that consumes game animals. There aren't any data available on the consumption of other forms of wild foods (mushrooms, blueberries,…).

The adoption of ecosystem approaches

60. **Describe in Table 24 the extent to which you consider that ecosystem approaches have been adopted for the different production systems in your country (widely adopted (2), partially adopted (1), not adopted (0), not applicable (NA)) and indicate whether ecosystem approaches are considered of major importance (2), some importance (1), no importance (0), not applicable (NA). You may also want to describe landscape approaches that have been adopted in your country.**

Table 24. Adoption of and importance assigned to ecosystem approaches in production systems in the Country.

Production system	Ecosystem approach adopted (name)	Importance assigned to the ecosystem approach (2,1,0,NA)	Importance assigned to the ecosystem approach (2,1,0,NA)
Planted forests: Temperate (F7)	Multifunctional forest management: Walloon forests are managed so that they fulfil all the functions assigned to them (production, hunting, social role, etc.) in a sustainable way.	2	2

Production system	Ecosystem approach adopted (name)	Importance assigned to the ecosystem approach (2,1,0,NA)	Importance assigned to the ecosystem approach (2,1,0,NA)
Livestock grassland-based systems: Temperate (L3)	A single environment permit is required for every agricultural business. This single permit combines the environmental permit and the planning permission. As in the current environmental permit, the following topics are taken into consideration: fauna and flora, soil, air, water, noise and people. Interventions having an impact on spatial planning, are in some cases subject to a planning permit. Both procedures will be integrated. The CAP focusses on a sustainable agriculture which includes economic, ecological and social aspects. As a result, every farmer receiving direct support, has to meet cross-compliance requirements and the greening measures of the CAP. These requirements include e.g. management requirements established by other EU directives and regulations (e.g. nitrate directive, legislation on plant protection (IPM), birds and habitats directives ...). The minimum requirements for good agricultural and environmental practices are also part of the cross-compliance measures (soil erosion, organic matter in the soil and soil structure, pesticide-free zones along watercourses, groundwater protection ...). There are 62 Natura 2000-areas in Flanders. These areas have been created to provide additional opportunities for habitats and species that are vital to European biodiversity. For each Natura 2000 site, specific nature goals or conservation goals have been set. These goals have to be achieved. The PAS (Programmatic Approach Nitrogen) provides a structured approach for the presence of nitrogen in Natura 2000 areas. Nitrogen is spread through the air and comes from various sources, including agriculture, industry, transport, households and abroad. These sources can be located close to a Special Protection Area, but also further. Landscape approach: - multisectoral approach of urban/rural development and land use in the rural area through the process of AGNAS (Afbakening van de Gebieden van de Natuurlijke en Agrarische Structuur = delimitation of the areas with a natural and agricultural structure). - Use of instruments provided for by the decree land development (land reparcelling, land development, natural area development).	0. Decree has been approved, the entry into force is planned. 2 1 0 1	1 1 2 1 1

Production system	Ecosystem approach adopted (name)	Importance assigned to the ecosystem approach (2,1,0,NA)	Importance assigned to the ecosystem approach (2,1,0,NA)
Livestock landless systems: Temperate (F7)	A single permit is complusory for every agricultural business. See above (L3) CAP: see above (L3) Natura 2000 and PAS: see above Landscape approach: idem L3	See above	See above
Naturally regenerated forests: Temperate (F3)	Multifunctional forest management: Walloon forests are managed so that they fulfil all the functions assigned to them (production, hunting, social role, etc.) in a sustainable way.	2	2
Self-recruiting capture fisheries: Temperate (A3)	Action plan “Selective fishing creates life” With PARIS (a programme of actions on rivers with an integrated and sector-based approach) and the sub-catchment fish and fishery management plans, Walloon watercourses are increasingly managed with a multifunctional approach (fight against flooding, ecosystem conservation, recreation, etc.) taking into account the features of their component sectors.	1 http://lv.vlaanderen.be/nl/visserij/visserijbeleid/actieplan-selectief-vissen	2
Fed aquaculture: Temperate (A11)	NA	NA	NA
Rainfed crops: Temperate (C11) Mixed systems: Temperate (M3)	Idem as under L3		
Mixed systems: Temperate (M3)	Permaculture	0	2
	River basin management plans	NA	?

Add row

Delete row

61. **For each production system in which an ecosystem and landscape approach has been widely adopted (as indicated in Table 24) describe:**

- **a. The specific actions that have been taken to ensure adoption;**
- **b. Any observed results from adoption;**
- **c. Plans for adoption or for further adoption in new or existing production areas;**
- **d. Lessons learned.**

a. The specific actions that have been taken to ensure adoption

Regarding L3:
- Environment permit: obligatory for each (agricultural) business as soon as the decree and the implementing decree have come into force.
- CAP: some CAP-measures are obligatory, other measures can be applied on a voluntary basis. As from 1st of January 2005, the payment of the direct aid measures is subject to cross compliance. A farmer which does not respect one or more conditions, will obtain less money. As far as the voluntary CAP-measures are concerned (for instance the agro-environmental

engagements resulting from the CAP Second Pillar), communication is provided to make the measures known to the farmers. The proper implementation of these measures is also monitored.
- AGNAS (Afbakening van de Gebieden van de Natuurlijke en Agrarische Structuur = delimitation of the areas with a natural and agricultural structure): policy process for which the Flemish government is both the initiator and the authority carrying out the process. Civil society has its say but has no decision power. Soon, each AgnasAGNAS-RUP (Ruimtelijk Uitvoeringsplan = Urban Execution Plan) will also be linked to an implementation plan focusing on its realisation.
- Decree land planning: Besides adjusting the procedures of land planning, tools for the the planning and management of land will be translated into decrees. It is already possible to use a broad 'toolkit', but this will allow to work in a more customized and integrated way. Plans and projects will be carried out more efficiently. However, the decree has not yet been finally approved by the Flemish Government.

Regarding F3/F7:
Publication of the Forestry Act with mandatory implementation of management plans that take into account the multifunctional role of forests. Particular attention is paid to the following: diversity of species planted, intensity of thinning, plantation distance of conifers from watercourse banks, maintenance of trees of biological interest, etc.
Implementation of the PEFC certification (Programme for the Endorsement of Forest Certification Schemes).

Regarding A3: - Fisheries checks at the landings as well as marine and air checks
b. Any observed results from adoption

Regarding L3:
CAP rural development: in 2010, a study investigated the impact of agri-environmental measures on farmland biodiversity. The results indicate that, after accounting for differences in habitat quality between parcels, more species of birds and more breeding territories were present in areas with a higher density of agri-environmental schemes aimed at conserving meadow birds (Strubbe et al, 2010).

Regarding F3/F7:
In Wallonia, the initial objective of 3% of strict nature reserves in publicly-owned deciduous forests has been exceeded, as 4% of strict nature reserves have already been designated.
Regarding A3: Action Plan for Selective fishing: http://lv.vlaanderen.be/nl/visserij/visserijbeleid/actieplan-selectief-vissen or http://lv.vlaanderen.be/sites/default/files/attachments/vistraject.pdf (De Snijder et al., 2015).

c. Plans for adoption or for further adoption in new or existing production areas

Regarding L3:
- Environment permit: is already in force for the whole Flemish Region.
- CAP: the new post 2013 programme builds on the previous program period and attaches great importance to sustainability. The cross-compliance conditions are maintained, but greening mesaures have also been incorporated into the new CAP-programme. The measures of the rural development program are applicable in specific management areas (some are applicable in the whole region of Flanders or Wallonia).
- AGNAS: each year, new areas are selected on a priority basis

RegardingF3/F7:
In Wallonia, similar measures designed to create strict deciduous nature reserves are planned on the Natura 2000 sites. It is not however possible to assess their situation at present.

Regarding A3: http://lv.vlaanderen.be/nl/visserij/visserijbeleid/actieplan-selectief-vissenLessons learned

Regarding L3:
- Some ecosystem approaches (e.g. AGNAS) require a vast amount of preparation as a result of which the implementation has been delayed.
- More monitoring activities are required regarding the quantification of the effects of a similar ecosystem approach.

Regarding F3/F7:
In Wallonia, it appears that recurring maintenance costs will be needed on the restored Life sites.

Regarding A3: http://lv.vlaanderen.be/nl/visserij/visserijbeleid/actieplan-selectief-vissen

Gaps and priorities

62. **With respect to the use of management practices or actions that favor or involve the use of biodiversity for food**

and agriculture:

a. **What are the major gaps in information and knowledge?**
b. **What are the main capacity or resources limitations?**
c. **What are the main policy and institutional constraints?**
d. **What actions are required and what would be the priorities?**

a. What are the major gaps in information and knowledge?

For certain measures, there are few quantitative data on the (positive and negative) effects (e.g. agri-environmental services, …) of these management practices on biodiversity and agriculture.

b. What are the main capacity or resources limitations?

Despite all the efforts of funding for research and demonstration projects focusing on the integration or co-existence of agriculture with nature or on organic agricultural production, many data still remain unknown and there is always need for more budget to clear all the knowledge gaps on the status and trends of the use of biodiversity for food and agriculture.

c. What are the main policy and institutional constraints?

No information available.

d. What actions are required and what would be the priorities?

No information available.

63. **With respect to the sustainable use of biodiversity for food and agriculture:**

a. **What are the major gaps in information and knowledge?**
b. **What are the main capacity or resources limitations?**
c. **What are the main policy and institutional constraints?**
d. **What actions are required and what would be the priorities?**

a. What are the major gaps in information and knowledge?

How can you achieve a sustainable use of biodiversity for food and agriculture in practice? There is still a lot unknown for instance on the functioning of the soil ecosystem, making it difficult to take the right measures for the long term. There is still a lot which has not been figured out about the resilience of ecosystems and the effects of human intervention on the long term (what are the limits of biodiversity taking into account other aspects of sustainability, ...)? There is a large set of measures (e.g. policy regarding fertilization, the policy on the sustainable use of plant protection), but it is uncertain whether these policies will be sufficient for biodiversity on the long term and for our food and agriculture production. Moreover, these measures always try to find a balance with other aspects of sustainability (economic and social). How can we encourage farmers to apply those approaches in practice? (with respect to both information of the public and the political decision makers).

b. What are the main capacity or resources limitations?

Despite all the efforts of funding of research and demonstration projects focusing on the integration or co-existence of agriculture with nature, many data still remain unknown and there is always need for more budget to clear all the knowledge gaps on the sustainable use of biodiversity for food and agriculture.
No information available.

c. What are the main policy and institutional constraints?

No information available.

d. What actions are required and what would be the priorities?

There is a lack of data to substantiate and evaluate policy actions. More monitoring and evaluation of the impact are needed to stimulate the correct and sustainable use of biodiversity for food and agriculture.

64. **With respect to the contribution of biodiversity for food and agriculture to improving productivity, food security and nutrition, livelihoods, ecosystem services, sustainability, resilience and sustainable intensification:**

- **a. What are the major gaps in information and knowledge?**
- **b. What are the main capacity or resources limitations?**
- **c. What are the main policy and institutional constraints?**
- **d. What actions are required and what would be the priorities?**

a. What are the major gaps in information and knowledge?

No information available.

b. What are the main capacity or resources limitations?

No information available.

c. What are the main policy and institutional constraints?

No information available.

d. What actions are required and what would be the priorities?

No information available.

65. **With respect to the adoption of ecosystem approaches:**

- **a. What are the major gaps in information and knowledge?**
- **b. What are the main capacity or resources limitations?**
- **c. What are the main policy and institutional constraints?**
- **d. What actions are required and what would be the priorities?**

a. What are the major gaps in information and knowledge?

There are disparate methodologies (however, standardisation is in progress). Often data availability is a problem.
It is obvious that the ecosystem approach has not yet been generally accepted as a lot of regulations and policies are sector-based.
The quantification of ecosystem services is a relatively new field of research.

b. What are the main capacity or resources limitations?

A large number of public authorities and regulations deal with water, soil, … and air issues. Although they consult each other frequently, there is no holistic approach. As a result of the current budgetary restrictions, it is very hard to invest in people, e.g. to make up multidisciplinary teams. This would require a totally different approach.

c. What are the main policy and institutional constraints?

It is a challenge to implement transversal, holistic approaches from different domains of activity when the policies are mainly sector based and treated by several different authorities. Despite this challenge, in recent years large efforts have been established to overcome this constraint, focussing on collaboration and consultation between environmental and agricultural authorities and aiming a more holistic multidisciplinary approach.

d. What actions are required and what would be the priorities?

A transversal policy approaches covering all relevant domains can support and stimulate the adoption of ecosystem approaches.

CHAPTER 5: The state of interventions on conservation and use of biodiversity for food and agriculture

Proposed structure of the chapter and information to be included in the Country Reports

The main objective of this chapter is to provide an assessment and analysis of national and local interventions and activities, along with the state of international collaboration, that support conservation and sustainable use of biodiversity for food and agriculture. The analysis of interventions specific to plant, animal, forest and aquatic genetic resources will be based on the information provided in the respective State of the World Reports.

Information on the following topics should be covered in the Country Report:

- National policies, programmes and enabling frameworks that support or influence conservation and sustainable use of biodiversity for food and agriculture and the provision of ecosystem services;
- Policies, programmes and enabling frameworks governing exchange, access and benefits;
- Information management;
- Local and informal-sector actors and initiatives;
- Availability of capacity and resources;
- Participation in international and regional policies, legal frameworks and collaboration with other countries;
- Knowledge generation and science for the management and sustainable use of biodiversity for food and agriculture.

National policies, programmes and enabling frameworks that support or influence conservation and sustainable use of biodiversity for food and agriculture and the provision of ecosystem services

66. **Identify and describe the main policies, programmes and enabling frameworks that support or specifically address the objectives below, briefly describing the policies, programmes or enabling frameworks listed and provide any available information on the extent of implementation or of lessons learned. For each objective, list up to 10 major policies, programmes and enabling frameworks.**

a. Support the integrated conservation and sustainable use of biodiversity for food and agriculture across sectors;
b. Support the conservation and sustainable use of associated biodiversity;
c. Address food security and nutrition with explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods;
d. Address the maintenance of ecosystem services with explicit reference to biodiversity for food and, associated biodiversity and/or wild foods;
e. Improve resilience and sustainability of production systems with explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods;
f. Support farmers, pastoralists, forest dwellers and fisher folk to adopt and maintain practices that strengthen the conservation and use of biodiversity for food and agriculture.

a. Support the integrated conservation and sustainable use of biodiversity for food and agriculture across sectors

Belgium
• Belgium has adopted its first National Biodiversity Strategy (2006-2016) in October 2006. It has been reviewed and updated in 2013. Both documents are available at: http://www.biodiv.be/implementation/docs/stratactplan.
• The first and second Federal Plans for Sustainable Development devote special attention to biodiversity. The plans also deal with biodiversity, sustainable forest management, and integrated management of the North Sea.
• The law of 27 December 2012 is an act containing various provisions on animal welfare, CITES, animal health and the protection of consumers health. It highlights measures to be taken in order to implement the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) and the Appendices, decided on 3 March 1973 in Washington, as well as the Amendment to the Convention, adopted on 22 June 1979 in Bonn.
• Belgium has a law on the protection of the marine environment in the areas under Belgian jurisdiction (law of 20 January 1999). The law's main aim is to conserve the characteristics, biodiversity and integrity of the marine environment through measures for its protection and, if necessary, restoration. Specific actions are directed at combating pollution, protection of species and habitats (designation of protected zones for the conservation of species and habitats), etc.
• The quota system for the marine fishery sector aims at the maintenance of fish stocks, by regulating the quantities that can be caught.

• For the period 2014-2020, greening is introduced in the CAP.
• Cross compliance of the CAP.
• The implementation of the integrated pest management in the framework of Directive 2009/128/EC stimulates the sustainable use of the biodiversity for crop protection.

Flanders
The Flemish Environmental Policy Plan 2011-2015 outlines the environmental policy that must be carried out by the Flemish Region, the provinces and the local authorities. The plan's primary function is to promote the efficacy and efficiency of the environmental policy and internal coherence at all levels and in all areas. In addition, the environmental policy plan also has an external function, since it was established by the entire Flemish Government and is therefore a commitment that has been made by every minister for his or her purview. This is also a requirement to achieve various objectives set by this plan. Furthermore, the plan provides clarity to third parties on the policy that they can expect during the planning period. This can encourage them to coordinate their decisions and actions accordingly. www.milieubeleidsplan.be

Wallonia
The strategic plan 2008-2013 of the administration in charge of agriculture, natural resources and the environment in the Walloon Region includes biodiversity objectives. In the Walloon Region, the administration for agriculture, natural resources and the environment has adopted a strategic plan with targets and indicators for the period 2008-2013. The Wallonia Nature Network, a progressive catalogue of concrete and realistic actions, is also being developed. More information on http://biodiversite.wallonie.be.

b. Support the conservation and sustainable use of associated biodiversity

Belgium
Bee Health, Our Health: Federal Bee Plan 2012-2014: In 2013, a specific plan dedicated to the preservation of pollinators, in particular bees, has been carried out. It includes about 30 actions and measures dealing with six main issues: the risk assessment and management for pollinators (including pesticides risk analysis), the integration of pollination in other policies and measures (including economy), the orientation of markets in favour of pollinators (in the broader framework of biodiversity and ecosystem services), the monitoring of honey bees and wild bees, animal health policy and the traceability of hives (for honey bees only). http://www.health.belgium.be/filestore/19084746/plan%20abeille%20fr_internet.pdf

National action plan for pesticide reduction: From 2013, the NAPAN (Nationaal Actie Plan d'Action National) has been established as the Belgian national action plan for pesticide reduction as requested by the EU directive 2009/128. It includes the Federal Reduction Plan for Pesticides 2013-2017 (FRPP), and the plans from the three Regions. Each of these plans comprises both specific actions and actions carried out jointly with the other members of the NAPAN Task Force. It aims to reach the objectives of reducing risks linked to pesticides as defined in EU Directive 2009/128/CE establishing a framework for Community action to achieve the sustainable use of pesticides.

Invasive species:
In Belgium, the policy on invasive species is shared by the federal and regional public authorities.
• The federal government deals with import, export and transit regulations as well as the ownership resulting from the import.
• The regional governments (Flanders, Wallonia, Brussels) deal with the regulations regarding the possession, trade, monitoring, detection and intervention, management and fight against certain problems.
Flanders
The Flemish action plan 'sustainable use of pesticides for the period 2012-2017' has a positive effect on natural pollinators and also on the ecosystem service pollination (De Bruyn, 2014a).
For the European hamster, a species protection program is under construction (ANB).
The maintenance of permanent grasslands is compulsory.

Wallonia
• The Walloon pesticide reduction programme (2013-2017) has had a beneficial effect on ancillary and thus on ecosystem services.
• The PCDN (municipal nature development plans): Action programmes aiming to maintain, develop and restore biodiversity locally by involving all the local stakeholders. PCDN 2011 Catalogue of projects. This is a participatory process, focused on two objectives:
o The implementation of projects (ponds in schools, orchards, hedges, agri-environmental measures with farmers, natural gardens in private homes, maintenance and management of nature reserves, the initiatives "Combles et Clochers" (attics and bell towers) and "Bords de Routes" (roadsides), etc.).
o Continuous awareness campaigns for the whole population.

c. Address food security and nutrition with explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods

Belgium
Fisheries policy. Regarding the implementation of the common fisheries policy, Belgium has developed an operational programme 2014-2020. The operational programme comprises the following references to biodiversity, both for the marine environment as for aquaculture:

1) Promotion of sustainable fisheries
o limiting the fishing on the marine environment, including where possible, preventing and limiting unwanted catches
o protection and restoration of aquatic biodiversity and ecosystems
o ensuring a balance between the fishing capacity and available fish
o promotion of competitiveness and viability of businesses in the fishing industry, also in small coast fishing industry, improving safety and working conditions
o providing support for more intensified technological development, innovation, including increasing energy efficiency, and knowledge
o the development of training activities, new professional skills and lifelong learning

2) promotion of a sustainable aquaculture
o providing support for more intensified technological development, innovation and transfer of know-how
o promotion of competitiveness and viability of businesses in the aquaculture industry, improving safety and working conditions, in particular in small and medium enterprises
o protection and restoration of aquatic biodiversity, the strengthening of the ecosystems linked to aquaculture and the promotion of a resource-efficient aquaculture
o promotion of an aquaculture characterized by a high level of environment protection, the promotion of animal health, animal welfare, public health and public safety
o the development of training activities, new professional skills and lifelong learning

3) stimulating the implementation of the Common Fisheries Policy
o the improvement and provision of scientific knowledge and improvement of data collection and management
o providing support for the monitoring, control and enforcement, and thus strengthening the institutional capacity and efficiency of public authorities without increasing the administrative burden.

4) promoting employment and territorial cohesion
o promoting economic growth, social integration and the creation of jobs, providing support for employability and labour mobility in coastal and inland communities which depend on fishing and aquaculture, including the diversification of activities within the fisheries and creation of links with other sectors of the maritime economy.

5) promoting of the marketing and processing
o improving the organization of the market in fishery products and aquaculture products
o the promotion of investment in the processing and marketing sector

6) promoting the implementation of the Integrated Maritime Policy (IMP)
The action plan 'Selective fishing creates life', adopted by the Flemish government and the sector in 2012, identified a number of key goals: the publication of a discardatlas for the Belgian fishing industry, research on the survival of discards, protection of fish resources by improving the selectivity of the fishing equipment, cooperation to new technical measures and analysis of the problems linked to the landing obligation (Van Bogaert et al., 2014). http://lv.vlaanderen.be/nl/visserij/visserijbeleid/actieplan-selectief-vissen, 2014).
Fish quota. The fishing opportunities, expressed in Total Allowable Catches (TAC's) and quota, are negotiated in December by the Council of the Ministers of Fisheries for the coming year. In 2014, the Council established the fishing opportunities for the Flemish fleet in 2015 in close cooperation with scientists and representatives of the Belgian fisheries industry.

Marine planning plan for the Belgian part of the North Sea. The Belgian North Sea is one of the most 'used' seas in the world: sShipping, tourism, fishing, sand extraction, wind energy production (wind mills) ... All these activities make use of what the sea has to offer. However, this activity ensures a high pressure. Different activities may hinder one another and may also have an effect on the environment. Therefore, in 2013 the government established a marine spatial plan for the Belgian part of the North Sea.
In the four sensitive areas of the protected natural areas 'Vlaamse Banken', professional fishing is only allowed under the following conditions:
- In zone 1, fishing is only allowed with adapted vessels, such as fishing nets causing less harm to the sea soil.
- Zone 2 and 4 are reserved for the testing of new technologies that reduce the impact on the soil and which are more environmentally friendly.
- In zone 3, the strictest conditions apply: there is a ban on all techniques causing harm to the soil.
In these four zones, there are no restrictions regarding techniques that do not touch the ground, such as fishing line or gillnets. Sustainable aquaculture is allowed in two wind energy plants if it reduces the eutrophication of the sea water. Aquaculture can become an important new activity for the Belgian fish industry.

Flanders (Scheppers & Casaer, 2014; www.natuurenbos.be)
Regarding large wild game, the public authorities define the number that each year can be shot. The hunter himself defines the number of other wild game he shoots. In Flanders, hunting is mainly organised through the so-called 'revierjachtsysteem'. In this system, hunting rights in a given area is herebyare leased for several years or even generations to the same hunter or the hunter's relatives. The hunter has an interest in hunting game species in a sustainable way, ensuring that the future of these species is not endangered. This is particularly the case for wild species having a smaller home range than the hunting area. When the home range is larger than the hunting area or in case of migratory game species, it is less important to perform sustainable hunting.

It is also forbidden to take away or to deliberate destroy, to transport or to sell nests and broods of birds, classified as wild game.

Hunters can group themselves voluntarily to a wildlife management unit (WBE) with a view to ensuring a better management of hunting game in particular, and other fauna and flora in general. Wildlife Management Units can be recognized and subsidized if they meet certain conditions. One of these conditions is that these WBE'sunits report their hunting data from the previous calendar year to the Flemish Agency for Nature and Forest (ANB). For big game species, both Wildlife Management UnitsWBE and independent hunters are required to report all the animals they have shot to ANB.

d. Address the maintenance of ecosystem services with explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods

Belgium
Pollination: Bee Health, Our Health: Federal Bee Plan 2012-2014: In 2013, a specific plan dedicated to the preservation of pollinators, in particular bees, has been carried out. It includes about 30 actions and measures dealing with six main issues: the risk assessment and management for pollinators (including pesticides risk analysis), the integration of pollination in other policies and measures (including economy), the orientation of markets in favour of pollinators (in the broader framework of biodiversity and ecosystem services), the monitoring of honey bees and wild bees, animal health policy and the traceability of hives (for honey bees only). http://www.health.belgium.be/filestore/19084746/plan%20abeille%20fr_internet.pdf

Flanders
Wood production: The positive and negative impacts of wood production primarily result from policy choices and incentives, and much less from the classical aspects of supply and use. The current policy is strongly corrects the market, so that the optimal combination of ecosystem services can be pursued and negative impacts can be minimized. The policy framework is highly developed in Flanders:
• ban on deforestation, large-scale clearing, removal of small landscape elements …
• implementation of the stand-still-principle (native woods cannot be replaced by exotic woods, mixed woods cannot be replaced by homogeneous woods, ...)
• Criteria for sustainable forest management in VENFlemish Ecological Networks (VEN's, IHD goalsconservation objectives for SPA Special Protection Areas, and a number of basic sustainability principles abroad (according to forest decree and guidelines around logging concessions and approval management plans).
This rather restrictive framework provides the necessary safeguards for the preservation and development of the timber production industry, but also for the preservation of other production-related ecosystem services in forests.
A number of policies have a stimulating effect on timber production and activation but simultaneously also support or enhance other ecosystem services (Vandekerkhove et al, 2014).
- The so-called 'bosgroepen' ('forest groups' ('bosgroepen' of forests) provide guidance and further activate owners, always starting from these win-win opportunities.
- Subsidies for the afforestation of agricultural land (under RDP the2nd and 3rd Rural Development Plan) and the subsidies for afforestation and reforestation (in the context of the forest decree) can positively influence the production potential.
- subsidies for the creation of comprehensive management plans can encourage forest owners to manage wood areas more actively. This will promote timber production and monitor the realization of other ecosystem services.
- Subsidies for the construction and maintenance of small landscape elements (local authorities, regional landscapes) can have a strengthening effect on the increase of the amenity and timber production in rural areas.
- Soil fertility: Erosion sensitive lands are divided into four classes: very high, high, medium and low erosion sensitive. On the very high and high erosion-sensitive plots, the farmer is obliged to implement erosion control measures. These erosion control measures are recommended on plots with a medium or low sensitivity.
- The erosion decree provides subsidies for erosion control plans at a local level. Following the approval of the local erosion control plan, the local authorities are allowed to carry out small-scale works to prevent erosion.

Wallonia
To protect and maintain native species and natural habitats in Wallonia, under 2009-2014 legislature the Minister for Sustainable Development launched a Biodibap (derived from the French words Biodiversité and bâtiments publics meaning biodiversity and public buildings) call for projects three times. This call aimed to promote installations in public buildings with a view to encouraging biodiversity, in the interests of cohabitation. Particular attention was paid to pollinating insects (flower-rich

meadows, hives, insect hotels, etc.).
Some provisions in application of the Hunting Act have been made to reduce big game populations.

e. Improve resilience and sustainability of production systems with explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods

Wallonia
Several policies include provisions to improve the resilience and stability of forests: the 2008 Forest Act, implementation of the Natura 2000 directive, an administrative memo on biodiversity for publicly-owned woods, etc.
Shooting plans (mentioned in No. 66c) are also involved in this section. Please note however that in Wallonia hunting plans only concern deer and not all big game species.

f. Support farmers, pastoralists, forest dwellers and fisher folk to adopt and maintain practices that strengthen the conservation and use of biodiversity for food and agriculture

Flanders
• Rural development programs: RDP II and RDP III: Associated biodiversity is targeted by the agri-environmental schemes (AES).
Certain AES-measures aim at the conservation of vulnerable species: (European hamster: Cricetus cricetus, Meadow birds: management aimed at a group of species including Limosa limosa, Vanellus vanellus and Haematopus ostralegus, Farmland birds: management aimed at a group of species including Perdix perdix, Emberiza citronella, Motacilla cinerea and Alauda arvensis)
Other AES aim at the installation of flowering margins, reduction of erosion, reduction of the use of pesticides and fertilizers, etc.
The rural development program also stimulates the forestation of agricultural parcels and the reforestation with indigenous trees.
• In Flanders, every year, a number of demonstration projects (average of about 10 projects per year having budgets between 50,000 and 100,000 euros each) are approved and financially supported. These projects are executed by the agricultural research centers, recognised as a 'center for sustainable agriculture' by the Flemish authorities. The goal of demonstration projects is to show to the farmers how to use or implement new techniques, new rules or for example new equipment turning the best agricultural practices more sustainable. Every year, in the research call are defined the themes in which the project proposal has to fit in. The call of 2014 had 4 projects approved on soil fertility, 3 projects on biological plant protection and 1 project on the greening measures. The call of 2013 resulted amongst others in 3 projects on the protection of surface water and 1 project on the implementation of the conservation goals on a farm. The 2012 call focussed on 5 projects demonstrating the implementation of IPM on the agricultural practices.
• In the field of game management, wildlife management units have been able to obtain grants from the Flemish authorities since 1998. Each wildlife management unit is entitled for a basic annual grant of 250 euros and an area subsidy of 125 euros for each tranche of 1,000 ha area over 2,000 ha. Additionally, a wildlife management unit can annually apply for a project grant of up to 1,500 euros for a nature preservation project linked to specific areas or species and which is subject to the implementation of the wildlife management plan. These grants are paid by the Agency for Nature and Forest (ANB) within the limits of the budget.

Wallonia
• The agri-environmental measure programme includes many measures relating to agricultural biodiversity. They involve both "ordinary" biodiversity, with a conservation objective and development of the ecological network, and "heritage" biodiversity (habitats and endangered species protected through measures regulated by advisers who set out suitable statements of requirements). See Thirion M. & Mulders C. (2010). The 2007-2013 Walloon agri-environmental programme – In short, all measures and subsidies Les Cahiers de l'Agriculture, July 2010 and http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/LC_44_FR.pdf.

67. **List up to 10 major policies, programmes and enabling frameworks in your country that enhance the application of an ecosystem approach or a landscape approach and that contain an explicit reference to biodiversity for food and agriculture, associated biodiversity and/or wild foods. Include a brief description of the policies, programmes and enabling frameworks together with any information on the extent of their application (production system and area) and observed effect. Where possible provide examples of best practices or lessons learned.**

- The BALANS project (2002-2006) stands for "Balancing impacts of human activities in the Belgian part of the North Sea". It brings together five partners (the Maritime Institute, the Sea Fisheries Department of the Flemish Community, Laboratory Ecotoxicology and the Section of Marine Biology of the University of Ghent, and the Management Unit of the North Sea Mathematical Models (MUMM)) in an attempt to develop a conceptual policy model for fisheries and sand and gravel extraction, in which ecological, economic and social indicators will be balanced in an integrated approach. In its operational phase, the model will help policy-makers to take informed decisions in order to achieve a sustainable management of the North Sea.

- The website http://www.natuurwaardeverkenner.be, called the "nature value explorer", is a calculation tool to value ecosystem services and can help everyone who wants to map the socio-economic importance of ecosystems. The calculated figures inform policy makers of the gain or loss of welfare resulting from the impact of a project or policy on the delivery of ecosystem services.
- The University of Namur elaborated a scientific assessment of the services provided by the ecosystems in the Walloon Region. It contains among others a cartography of the ecosystem services in this part of the country. A case study was developed on the monetary value of the forest ecosystem services in the Walloon Region. The report (in French) is available at: http://etat.environnement.wallonie.be/download.php?file=uploads/rapportsetudes/Dossier%20scientifique%20SE_RW_VF[1].pdf .
- The yearly research call for, approval and financial support of demonstration projects, executed by the agricultural research centers, recognised as a 'center for sustainable agriculture' by the Flemish authorities, supporting farmers in demonstrating new techniques and (ecosystem) approaches.
- Codes for Good Agricultural Practices. E.g. http://lv.vlaanderen.be/nl/voorlichting-info/publicaties/praktijkgidsen
- Faced with the widespread loss of biodiversity (and its significant socio-economic consequences for the Region), Wallonia seeks to supplement its response by developing decision-making tools based on the concept of ecosystem services. More specifically it means to make its actions more interdisciplinary in regard to environmental conservation by using the ability of this concept to establish links between ecosystems and society, conservation and development. To this end, an administrative-scientific platform was launched in late June 2014. At this stage (2015), the aim of the platform will be to establish a conceptual framework and general methodology in line with future developments, as well as a preliminary map and assessment of ecosystem services on a regional scale, including those relating to food and agriculture.
- The legal basis of the future sub-catchment fish and fishery management plans can be found in the new Decree of 27 March 2014 on river fishing, fishery management and fishery facilities. These plans are part of PARIS, integrated action programmes for Walloon watercourses based on an integrated, multifunctional approach to managing watercourses, taking into account the ecosystem services these provide.
- Natura 2000-policy : Flanders has 62 Natura 2000-areas (166,.000 ha), Wallonia has 240 (220.,000 ha). These areas are defined to provide additional opportunities for habitats and species that are vital to European biodiversity. For each Natura 2000 site, there are specific goals or conservation goals that have to be achieved. The 'PAS' (Programmatic Approach Nitrogen) provides for a structured approach to the deposition of nitrogen in Natura 2000 areas. Nitrogen descends from the air and comes from various sources, including agriculture, industry, transport, households and other countries. These sources can be located close to a Special Protection Area, but also further away.
- An environment permit is required for farmers and other entrepreneurs who want to start up an industrial or handicraft activity. The environment permit is a combination of the current environmental permit and planning permission. The current environmental permit deals with the following aspects: flora and fauna, soil, air, water, noise and people. Infrastructure works that have an impact on spatial planning are in some cases subject to a planning permit. Both procedures are being integrated.
- In Europe, river basin management plans are made under the water framework directive. This directive ensures a sustainable use of water resources and water quality in Europe and imposes Member States to do so. It provides an approach to water management based on river basins, the natural geographical and hydrological units. The river basin management plan defines goals on a six-year basis and contains measures in order to achieve good water standards by 2027 at the latest.
- In Wallonia, management of publicly-owned forests includes landscaping aspects.

Briefly describe policies, programmes and enabling frameworks that meet the objectives described in questions 68 and 69. Consider the following discussion points in your responses, where information is available:

a. extent of implementation;
b. production systems involved;
c. the extent of use of biodiversity for agriculture;
d. lessons learned;
e. evidence of indicators of vulnerability that have decreased as a result of these efforts;
f. describe the value added of mainstreaming gender in programmes, policies and enabling frameworks, providing sex-disaggregated data where possible.

68. Describe up to 10 major policies, programmes and enabling frameworks in your country that embed the use of biodiversity for food and agriculture, including its different components, into disaster management and response.

No information available.

69. Describe up to 10 major policies, programmes and enabling frameworks in your country that embed the use of biodiversity for food and agriculture, including its different components, into climate change adaptation and mitigation strategies

and plans (NAPAs, NAPs, NAMAs, etc.).

(The answer to question 69 is added in the text field of question 70, because of a resticted number of characters in this text field.)

70. **What arrangements are in place or foreseen in your country that help to ensure that the conservation of biodiversity for food and agriculture is taken into account in national planning and policy development of sectors other than agriculture (e.g. NBSAPs or infrastructure development such as transport or energy)?**

Answer to question No. 69:

In 2010, Belgium adopted its national climate adaptation strategy. It has 3 objectives:
- to improve the coherence between existing adaptation activities in Belgium (assessing the impacts of climate change, vulnerability to climate change and adaptation measures already implemented);
- to improve communication at national, European and international levels;
- to initiate a process to develop a national action plan.

The Strategy summarizes the expected impacts of climate change in Belgium in several areas including biodiversity and gives an overview of the adaptation measures that have already been made in these areas (including agriculture, forestry, biodiversity and ecosystems) as well as two cross-cutting areas: research and international cooperation. http://www.lne.be/themas/klimaatverandering/adaptatie/bestandenmap/nationale-adaptatiestrategie

The Flemish Region has published in 2013 the regional plan for adaptation to and mitigation of climate change (Het Vlaams Klimaatbeleidsplan 2013-2020). Measures for nature development and restoration of ecosystems contributing to adaptation and mitigation are also included. http://www.lne.be/themas/klimaatverandering/klimaattips/klimaattips/wat-doet-de-vlaamse-overheid/vlaams-klimaatbeleidsplan.

The Walloon Region adopted in 2007 the Walloon Plan ‘Air-Climat-Energie 2008-2012’ available on www.awac.be. Today Walloon Region updates the plan. It also contains the agricultural sector.

Brussels-Capital Region approved in September 2013 the proposal of pre-project for the regional plan air-climate-energy.

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Answer to question No. 70:

The fifth objective of the Belgian National Biodiversity Strategy is to improve the integration of biodiversity concerns into all relevant sectorial policies. As biodiversity touches upon almost all economic sectors, the protection of biodiversity cannot be achieved only through environmental policies. Biodiversity must become the base of an integrated economic and social development. This implies that biodiversity concerns must be taken into account during the development and implementation of all relevant sectorial plans, programmes, legislation and policies that may have an impact on biodiversity.

Several sectors are particularly important with regard to biodiversity: spatial planning has a major impact on biodiversity, as it can play a major role in habitat fragmentation and can cause uncontrolled development pressures on biodiversity; industry, transport and energy sectors can have global and regional impacts on biodiversity through climate change and acidification, and furthermore can have a local impact through habitat fragmentation, destruction of habitats and disturbance of wildlife; etc. The 2020 objective will only be achieved when all the relevant sectors integrate consideration for biodiversity in their plans and policy.

According to the subsidiarity principle, the lowest appropriate level has to take efficient and effective action. Therefore, regional and local authorities should be involved in coordinating and facilitating such actions where possible. The use of participative approaches can here be helpful (Belgian National Focal Point to the Convention on Biological Diversity, 2013).

Faced with the widespread loss of biodiversity (and its significant socio-economic consequences for the Region), Wallonia seeks to supplement its response by developing decision-making tools based on the concept of ecosystem services. More specifically it means to make its actions more interdisciplinary in regard to environmental conservation by using the ability of this concept to establish links between ecosystems and society, conservation and development. To this end, an administrative-scientific platform was launched in late June 2014. At this stage (2015), the aim of the platform will be to establish a conceptual framework and general methodology in line with future developments, as well as a preliminary map and assessment of ecosystem services on a regional scale, including those relating to food and agriculture.

71. **Has your country identified any obstacles to developing and implementing legislation that would protect associated biodiversity? List and describe initiatives in Table 25.**

Table 25. Obstacles to developing and implementing legislation that would protect associated biodiversity identified in the country.

Component of associated biodiversity	Obstacles to legislation for protection of associated biodiversity
Not specified	large pressure / claim on land
Not specified	different stakeholders and different interests on small surface
Not specified	complex Belgian institutional systeminvolvement of different authorities that are competent for different aspects of the policy on biodiversity for food and agriculture
Not specified	socio-economic aspects often considered a priority compared to the environmental aspects of development in public policies and actionsinterplay between environmental and socio-economic goals to achieve and the political priorities that are taken for it.
Agricultural ecological network	not a priority for monitoring and penalties in the event of non-compliance with protection legislation (see e.g. conditionality)

Add row
Delete row

Provide a concise description of the obstacles to legislation reported in Table 25, and specify a course of action proposed to address this, where possible. Where possible provide examples of best practices or lessons learned.

Policies, programmes and enabling frameworks governing exchange, access and benefits

72. **Has your country taken measures with the aim of ensuring that access to its genetic resources shall be subject to its prior informed consent (PIC) and that benefits arising from their utilization shall be shared in a fair and equitable manner? If yes, identify for which resources and for which uses (e.g. to conduct research and development on the genetic and/ or biochemical composition of the genetic resource) prior informed consent has to be obtained and benefits have to be shared. Indicate in Table 26 for the different categories (and possibly uses) of associated biodiversity, if prior informed consent has to be obtained and benefits have to be shared.**

Table 26. Policies and programmes governing the access to its genetic resources of associated biodiversity established in the country.

Component of associated biodiversity	Intended use (e.g. any use, research and development, commercial use)	PIC and benefit-sharing required (Y/N)
All material of public collections from species of annex I of the International Treaty on Plant Genetic Resources for Food and Agriculture (exchange of material using the standard Material Transfer Agreement (sMTA))	Any use	Y
All other material	Any use	N

Add row
Delete row

73. **Has your country taken measures with the aim of ensuring that the prior informed consent or approval and involvement of indigenous and local communities is obtained for access to genetic resources and that benefits arising from the utilization of genetic resources that are held by indigenous and local communities, are shared in a fair and equitable way with the communities concerned, based on mutually agreed terms? If yes, provide a description of the measures and where possible, examples of best practices or lessons learned.**

Not relevant for Belgium, as there are no indigenous and local communities in Belgium.

Information management

74. List and describe any linkages between sector information systems on biodiversity for food and agriculture at national level. Where possible provide examples of best practices or lessons learned.

75. **Has your country established national information systems on associated biodiversity? List in Table 27, along with a description of the components of associated biodiversity addressed, and a brief description of information included, use and applications of the information system.**

Table 27. National information systems on associated biodiversity in the Country.

National information system (List)	Components of associated biodiversity addressed (List)	Concise description of information systems
Belgian Biodiversity Platform	Biodiversity in general	www.biodiversity.be. The Belgian Biodiversity Platform provides services to the Belgian scientific community engaged in biodiversity research. As a science-policy interface, it provides neutral and scientifically credible information on all aspects of biodiversity science. The platform offers services related to data publication, management and use, science networking, training and capacity building, as well as think-tank activities. The Belgian Biodiversity Platform is a multidisciplinary team composed of natural and social scientists that provides adequate services to Belgian scientists.

National information system (List)	Components of associated biodiversity addressed (List)	Concise description of information systems
www.biodiv.be	The objectives of the website are to: - deliver information on the Convention on Biological Diversity and its implementation in Belgium; - provide on-line versions of Belgian strategic documents related to the Convention (national reports, strategies, actions plans, etc.); - offer information on the status of biodiversity in Belgium; - make links to Internet-based biodiversity information in Belgium; - offer a window for scientific and technical cooperation in the field of biodiversity; to promote public awareness and education on biodiversity.	This website is the Belgian contribution to the Clearing-House Mechanism under the Convention on Biological Diversity (CBD).
www.waarnemingen.be	Flemish, non-standardized data of all species groups	Waarnemingen.be is an initiative of Natuurpunt Studie vzw and the Stichting Natuurinformatie. Data are collected by many volunteers and working groups.
http:// www.biodiversityindicators.be, www.natuurindicatoren.be, www.milieurapport.be	Status and trends of main species groups and habitats.	An extensive monitoring programme has been developed to monitor habitats and species of European interest and the effects of management measures in nature and forest reserves and government domains. Flemish Atlas of Breeding Birds, including farmland birds. "Nature report 2007: State of nature in Flanders: data for policy" gives a comprehensive reporting of the conservation status and the trends of habitats and species. For the following reporting in 2019 a more focused monitoring is being developed, priorities and inventory networks are determined and methodologies are worked out.
Vis Informatie Systeem	fish, fish population, fish pollutant, fish indexes and release of young fish in Flanders	Interactive data bank http://vis.inbo.be
The permanent inventory of Walloon forest resources	Plant biodiversity Standing and fallen dead wood Natural regeneration	Reading biodiversity indicators from observation units spread throughout Walloon forests every 1.,000 m in 500 m
		The evaluation of the conservation status of natural habitats is performed by biogeographical region.
http://biodiversite.wallonie.be/fr/especes.html?IDC=3025		Species-based data for Wallonia can be consulted on-line

National information system (List)	Components of associated biodiversity addressed (List)	Concise description of information systems
		Information on species-based data for the Brussels-Capital Region can be found at: -http://documentation.bruxellesenvironnement.be/ documents/NARABRU_20120910_FR_150dpi.pdf (French) - http://documentatie.leefmilieubrussel.be/documents/ NARABRU_20121004_NL_150dpi.PDF (Dutch).
http:// etat.environnement.wallonie.be/ index.php?page=icew-2012	Biodiversity in general	Multi-annual report on the state of the environment in Wallonia

Add row

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76. Has your country established information systems intended to support maintenance of traditional knowledge on biodiversity for food and agriculture, including associated biodiversity? If yes, describe these and include information where available on socio-economic, policy and collective action aspects.

Stakeholder participation and ongoing activities that support maintenance of biodiversity for food and agriculture

77. **List the most important stakeholder groups, including groups or associations of farmers, forest dwellers, fisher folk and pastoralists, NGOs or other civil society organizations active in the conservation of biodiversity for food and agriculture. Briefly summarize their scope, objectives and activities and any outcomes to date. Where possible provide examples of best practices or lessons learned.**

The following stakeholders, outside the governmental organisations of the different federal and regional governments are important in this domain and have been consulted over this report in May 2015 (see also under Chapter 1, No. 1 Preparation of the Country Report):

• Farmers organisations: Boerenbond, Féderation Wallonne de l'Agriculture (FWA), Algemeen Boerensyndicaat (ABS), Bioforum Vlaanderen, Bioforum Wallonie, Biowallonie, Vlaams Agrarisch Centrum (VAC), Fédération Unie de Groupements d'Eleveurs et de 'Agriculteurs (FUGEA), Bauernbund;
• Fishers organisation: Rederscentrale;
• Intersemza, Comité Régional Phyto, Association wallonne de l'élevage, Union nationale des Agrobiologistes Belges (UNAB), Collège des producteurs ;
• Nature organisations: Natuurpunt, Bond Beter Leefmilieu, Greenpeace, Wervel, Velt, WWF, Natagora, Landschap vzw, Aves, Nature et Progrès, Société Royale Forestière Belge, Forêt Wallonne, Inter Environnement Wallonie, Fédération des parcs naturels de Wallonie, Natagriwal, Fondation Rurale de Wallonie, Réseau Wallon de Développement rural, Landelijk Vlaanderen, Bosplus ;
• Arboretums/Botanical Gardens of Beveren, Liege, Antwerp, Leuven, Wespelaar, Bokrijk (www.plantcol.be);
• Beekeepers organisations: Centre Apicole de Recherche et d'Information (CARI), Algemene Vlaamse Imkersvereniging (AVI), Informatiecentrum voor de Bijenteelt, Koninklijke Vlaamse Imkersbond vzw (KonVIB), Vlaams Nederlandse Imkersfederatie (VNIF), Vlaams Vulgarisatiecentrum voor Bijenteelt (VVCB);
• Hunting organisations: Royal Saint-Hubert Club de Belgique, Hubertus Vereniging Vlaanderen;
• Organisations for the conservation of plant and animal genetic resources: Nationale Boomgaardenstichting vzw, Steunpunt Levend Erfgoed vzw;
• Universities and colleges of higher education: Katholieke Universiteit Leuven, Université Catholique de Louvain, Ghent University, University of Antwerp, Universiteit Hasselt, Université de Liège, Université de Mons, Université de Namur, Gembloux Agrobiotech, Vrije Universiteit Brussel, Université Libre de Bruxelles;
• natural Resources Human Environment & Agronomy research center (RHEA);
• Maison wallonne de la pêche, Fédération Sportive des Pêcheurs francophones de Belgique.

78. **Describe any incentives or benefits to support activities for the conservation and sustainable use of biodiversity for food and agriculture or associated biodiversity (such as payments, provision of inputs, subsidies or other forms of**

incentives/ benefits). Briefly describe how these have been applied, to what extent and the stakeholders involved (including provisions on gender balance if any). Indicate any lessons learned and planned development incentives.

• Agri-environmental schemes (AES, as part of the rural development program): subsidies payments for the creation and maintenance of field margins, landscape elements, prevention of erosion, reduced fertilization, reduced pesticide use, reduced tillage, …
• Organic agriculture: payments for (conversion to) organic farming, depending on crop type and farm type, support for advice on organic farming, support for the control costs for the compulsory organic certification, support for the farmers' association for organic farmers, specific project support for research and food chain development projects on organic farming.
• Agroforestry: subsidies for the installation of agroforestry.
• Greening of the EU Common Agricultural Policy (CAP)
• EU biodiversity strategy is an incentive for the EU Member States to create incentives to support biodiversity.

79. List up to 10 major projects (either in progress or completed in the last five years) that support the conservation and sustainable use of biodiversity for food and agriculture, associated biodiversity and/or wild foods. For each project listed describe the components of biodiversity, the production system and area covered, and the results, outcomes and lessons learned. Projects described in sector reports need not be described here.

• Interreg IVa SOLABIO (species and landscapes as keys to biodiversity, 2008-2012)
o Components of biodiversity:
- Vertebrates: farmland and meadow birds
- Invertebrates: natural enemies of pest species, pollinators
o Production systems: mainly C11 (rain fed crops), also L3 and M3
o Results and outcomes: End report: http://www.vlm.be/SiteCollectionDocuments/Publicaties/SOLABIO/SOLABIO.pdf

• Agrobeheercentrum Ecokwadraat (2012), originating from the Eco² project
o Indirectly supporting biodiversity by providing solutions for maintenance of landscape elements by involving farmers: hedges, trees, field margins, …
o Components of biodiversity: habitat creation and maintenance
o Production systems: All, but mainly land-based systems (L3, C11 and M3)
o Area covered: Flanders
o Results and outcomes: increasing number of landscape elements and field margins are managed, with an increasing number of farmers involved. http://www.agrobeheercentrum.be

• Agroforestry in Flanders:
o The aim of the project is to stimulate research and practical experience through integrated cooperation between all stakeholders, in order to be able to offer guidance and solutions for agroforestry practitioners in Flanders. The overall objective is to stimulate effective and competitive agroforestry systems in Flanders.
o Production systems: livestock landbased systems and arable cropping systems (C11, L3 and M3)
o Area covered: Flanders
o www.agroforestryvlaanderen.be

• Agroforestry in Wallonia:
various projects and associations working on promoting agroforestry among stakeholders on the ground through research, information, extension work and training in agroforestry implementation techniques that allow integration into traditional agricultural production systems.

• Valuation Of Terrestrial Ecosystem Services in a multifunctional peri-urban space (VOTES)
The VOTES project was a two-year project funded under the BELSPO science for sustainable development call by the Federal Public Planning Service Science Policy (BELSPO). Researchers from the University of Namur, Brussels (VUB), Lière (ULG) and the Flemish Research Institute for Nature and Forest (INBO) were involved. The main objective of the project was to quantify the importance of key ESecosystems for four municipalities in central Belgium by integrating social, biophysical and economic valuation exercises involving stakeholders, and taking into account scenarios of climate and land use change. Outcomes of the valuation exercises were meant to feed in the local decision-making process related to landscape planning. The study aimed to balance scientific and policy objectives though only scientists designed the project.

• De Wijers": application of the ecosystem services framework for sustainable area development
Overall, this was a very interesting pilot of bottom-up mainstreaming of ecosystem services in regional planning. The concept and used approach can certainly contribute to vision development, especially for regions with complex land-use and many involved stakeholders. However four elements will need special attention: the inclusion of powerful but less concerned partners, inclusion of invisible services and services which are not ecosystem-related, and efficient use of workshop time.

• Natuurwaardeverkenner (nature value explorer) (http://natuurwaardeverkenner.be): Just because the Flemish public authorities understand the importance of ecosystem services and the role they can play to take well-informed decisions, the Department of Environment, Nature and Energy commissioned a study on the importance and the economic value of ecosystem services. This study was carried out by a team of economists and ecologists of the Flemish Technology Research Institute VITO (Vlaamse Instelling voor Technologisch Onderzoek) and the Antwerp and Amsterdam universities. An ecosystem supplies goods and services to people and has an impact on the welfare or well-being of a society. By using the natural value explorer, one is able to explore the importance of these services and to estimate how changes in land use affect the ecosystem services.

• Ecosystem service Bundle Index (EBI): The Ecosystem service bundle index is a prototype of a tool developed to capture ecological complexity of delivery of ecosystem service bundles. Rather than providing a prescription of the ideal land-use, it aims to inform decision makers by demonstrating the consequences of land use choices in a given landscape context. The tool was developed by the research group 'ECOBE' of the University of Antwerp and Ghent University in the extension of the BELSPO funded project ECOFRESH.

• Valuation of Terrestrial Ecosystem Services in Wallonia. Research by the University of Namur aiming to assess ecosystem services; an attempt was made to quantify and financially assess forest ecosystem services (research funded by Wallonia Public Services).

• LIFE projects are co-financed by Europe. In particular, they aim to restore the biotopes and habitats of species targeted by the Birds and Habitats Directives " on Natura 2000 sites and find new balances between the various ecosystem services in areas where production activities are generally more difficult. Some projects in Wallonia (http://biodiversite.wallonie.be/fr/projets-life.html?IDC=3260):
o HERBAGE : Restoration of meadows and pastures
o BOCAGE: Restoration of bocage species and habitats
o ARDENNES LIEGEOISES : Restoration of open areas rich in biodiversity
o ELIA-RTE : Leveraging land beneath high-voltage lines B/FR

• Maya plan: Wallonia has established the Maya plan. The objective of the Maya plan is to conserve bee and pollinating insect populations on Walloon soil with a view to protecting the environment, biodiversity and food security. The plan involves promoting hedges and pastures, flower-rich meadows, support for young apiarists, subsidisation of research into the decline of bees, late harvesting, and the establishment of charters with townships that agree to create habitat that is favourable for bees.

• Wallonia has established a network of 20 specialist advisers for the implementation of both the agri-environmental programme and habitat restoration within the framework of the EU's Natura 2000 network. Farms participating in the target section of the programme, i.e. involving heritage species and habitats, are the priority focus of the agri-environmental framework.

80. **List in Table 28 up to 10 major landscape based initiatives to protect or recognize areas of land and water in your country of particular significance for biodiversity for food and agriculture.**

Table 28. Landscape based initiatives to protect or recognize areas of land and water in the country with particular significance for biodiversity for food and agriculture.

Landscape based initiatives	Description of sites and their characteristics of relevance to biodiversity for food and agriculture	Extent (area)
MPA (marine protected areas)	An important national instrument is the Law of 20 January 1999 on the protection of the marine environment in the areas under Belgian jurisdiction. This foresees the identification and designation of marine protected areas (MPA) (among others in application of the EU Habitat and Birds Directives). Measures for MPAs to reduce the impact of bottom-affecting gear are currently being negotiated as part of the Marine Spatial Planning. An impact analysis of human activities (including fisheries) and measures in view of achieving the objective of Good Environmental Status (Marine Strategy Framework Directive) will be included in the programme of measures which is currently being prepared (to be submitted to the European Commission in 2015).	

Landscape based initiatives	Description of sites and their characteristics of relevance to biodiversity for food and agriculture	Extent (area)
Management areas Agro-environmental schemes	Management areas have been established for various agro-environment-climate measures. A management agreement (contract) can be concluded forwithin these specific areas. Examples are management areas for species protection, botanical management areas and areas for meadow birds.	botanic management: 57,458 ha management of field birds: 82,930 ha management of meadow birds and IHD species: 156,195 ha
Special Protection Areas	These areas are established to provide additional opportunities for habitats and species that are vital to European biodiversity (including habitats and species associated with agriculture and food production).	220,944 ha (Wallonia) 166,322 ha (Flanders)

Add row

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Collaboration between institutions and organizations

81. **Describe existing linkages and collaboration between sectors in national programmes and policies governing conservation and sustainable use of biodiversity for food and agriculture. These may include overall strategies and plans developed by your country, committees or other national bodies which oversee or support collaboration, shared actions, facilities or resources and specific activities which involve inter-sector collaboration.**

- The Flemish Government supports the projects of the Agromanagement centre, named ECO², grouping over 20 agromanagement groups of farmers collaborating on landscape, nature and water management (www.agrobeheercentrum.be);
- The National Committee on Plant Genetic Resources is a working group with members of the different concerned governments (regional and federal) that coordinates at the Belgian national level all actions and initiatives related to Plant Genetic Resources and cultivated plant biodiversity. The main tasks of the Committee are the following:

- policy coordination between the different regional and federal administrations in charge of these matters;
- setting up and management of a Belgian National Inventory of Plant Genetic Resources collections;
- preparation, coordination and reporting of the Belgian delegates participating to meetings of international fora related to PGR; especially Biodiversity International and its European Cooperative Programme for Plant Genetic Resources - ECPGR (and AEGIS) – www.ecpgr.cgiar.org), the FAO and the International Treaty on Plant Genetic Resources for Food and Agriculture - www.planttreaty.org, the Convention on Biological Biodiversity (CBD, www.biodiv.be - www.cbd.int , ...);
o national coordination of all related ad hoc topics (threatened collections, establishment of national collections, national strategies, …).
- Also for animal genetic resources, a National Committee is active as a coordination body.
- Federal Bee Plan 2012-2014 (reference to answer in No. 66).
- Maya Plan in Wallonia: involvement of townships (see Pointreference to answer in No. 79)
- On a federal level, theThe working of the Belgian Biosafety Advisory Council: as a scientific advisory body for the evaluation of genetically modified organisms (GMOs) and pathogen organisms, in the market approval process; this advisory system is put in place by a cooperation protocol between the federal and regional authorities involved in and competent for the biosafety evaluation in Belgium. système commun d'évaluation scientifique mis en place en Belgique pour aviser les autorités compétentes fédérales et régionales à propos de la biosécurité des activités mettant en jeu des organismes génétiquement modifiés (OGMs) et/ou des organismes pathogènes
- In Wallonia, the CiEi (Cellule interdépartementale Espèces invasive): committee responsible for coordinating actions aiming to limit the damage caused by invasive species in Wallonia since November 2009. It implements preventive and adaptive measures to the regulatory framework, is developing an alert system, coordinates control operations, contributes towards improving knowledge and liaises with managers and the general public.
- In Wallonia, a number of committees including both representatives of official organisations and stakeholders have been created. These include:

- Conseil Supérieur Wallon des Forêts et de la Filière Bois (CSWFFB),
- Conseil Supérieur Wallon de la Chasse (CSWC)
- Conseil Wallon de l'Environnement pour le Développement Durable (CWEDD)
- Conseil Supérieur Wallon de la Conservation de la Nature (CSWCN)

- Given the importance assigned to the subject, a Belgian community of practice was launched on ecosystem services (April 2012). The Belgium Ecosystem Services (BEES) Community (http://www.beescommunity.be/en/) is an open and flexible network that interfaces between different societal actors. The BEES community is open to all potentially interested organizations (policy, business, NGO's, science, consultancy, civil society…). It was among others set up as a result of the BEES (BElgium Ecosystem Services) cluster of the Belgian Science Policy and the project 'BElgium Ecosystem Services - A new vision for society–nature interactions' (final report available on: http://www.belspo.be/belspo/SSD/science/Reports/FinalReport_BEES%20ML.pdf).

The BEES Community has the following objectives:

o Develop ecosystem services concepts, tools and practices that help to adapt human activity and clarify ecosystem thresholds in order to preserve the actual and potential well-being of present and future generations; and to stop ecosystem and biodiversity degradation, and improve their status;
o Develop mainstreaming &and policy tools to promote the integration of ecosystem services concepts in policy and management, business and society;
o Facilitate capacity building, exchange of expertise and experience: including methodologies and transfer of knowledge on Belgian ecosystem services to policy and share the needs from policy makers on this issue, to enable involvement of Belgian actors in national and international initiatives and build the capacity to conduct assessments of ecosystem services;
o Provide overviews of state of the art knowledge and best practices.

- Faced with the widespread loss of biodiversity (and its significant socio-economic consequences for the Region), Wallonia seeks to supplement its response by developing decision-making tools based on the concept of ecosystem services. More specifically it means to make its actions more interdisciplinary in regard to environmental conservation by using the ability of this concept to establish links between ecosystems and society, conservation and development. To this end, an administrative-scientific platform was launched in late June 2014. At this stage (2015), the aim of the platform will be to establish a conceptual framework and general methodology in line with future developments, as well as a preliminary map and assessment of ecosystem services on a regional scale, including those relating to food and agriculture.

82. **How are ministries working together to meet Aichi Targets as they may apply to the conservation and sustainable use of biodiversity for food and agriculture in your country?**

An important step to meet Aichi targets at the national level is to include them in the national objectives, through the national biodiversity strategy*. Belgium's National Biodiversity Strategy 2006-2016 (NBS) was adopted on 26 October 2006 by the Interministerial Conference for the Environment, which is composed of the competent ministers of the Federal Government, the three Regions of Belgium (Flanders, Brussels, Wallonia) and the three Communities (Flemish, French, German). It is still the only national document on biodiversity policy that embraces the responsibilities of the different governments in Belgium in order to comply with the European and international commitments made by Belgium. It offers a framework in terms of the policy to follow and the subsequent implementing actions to be developed.

The Steering Committee "Biodiversity Convention" initiated the process of updating the NBS in 2011 jointly with the Steering Committee "Nature". These committees gather the Regional and Federal Belgian competent authorities, scientists and environmental NGOs.

In March 2012, the Interministerial Conference for the Environment decided to update Belgium's National Biodiversity Strategy 2006-2016 before its end and to align its term with the 2020 target. This offers the possibility of adjusting the content of the strategy by taking on board the new international commitments made under the biodiversity-related agreements –including Aichi targets- and at EU level, while considering the conclusions of the mid-term state of play of the implementation of the NBS up to 31/12/2011 and the recommendations formulated to update the NBS.
The Strategy aims at giving strategic political orientations in order to allow actors for biodiversity in Belgium to work in partnership to contribute nationally and internationally towards the achievement of the target of halting the loss of biodiversity by 2020.
The strategy spells out a range of 15 priority strategic objectives and 85 operational objectives (eight of them are new) to guide the development of actions by the competent regional and federal authorities. Following the recommendations to update the NBS, some parts have been somewhat adapted to fully reflect the commitments to meet the CBD Aichi targets and the new EU Biodiversity Strategy to 2020.

The text of the NBS clearly identifies, for each objective, the link with articles of the CBD, the relevant Aichi Target, thematic programmes of work, guidelines, etc. adopted. A concordance table was created as an appendix to the NBS, which links the Aichi targets with the objectives of the updated NBS.

See answer to question 83 for details on the objectives set to meet Aichi Targets as they may apply to the conservation and sustainable use of biodiversity for food and agriculture.

The full text of the objectives, their correspondence with Aichi targets and their implementation are available on: http://nbsap.biodiv.be/objectives.

*All information on Belgium's National Biodiversity Strategy are available on the Belgian Clearing-House Mechanisms at http://www.biodiv.be/implementation/docs/stratactplan. http://www.biodiv.be/implementation/docs/stratactplan.

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Answer to question No. 83:

Objective 4: Ensure and promote the sustainable use of components of biodiversity
4a) General
- 4a.1 Identify and promote good practices involving the sustainable use of biodiversity
4b) Sustainable products, consumption and production policies
- 4b.1 Avoid or minimise the risk to biodiversity posed by production and consumption, products and services
- 4b.2 Adopt biodiversity criteria in public procurement policies to prevent biodiversity loss
4c) Agriculture
- 4c.1 Promote measures favourable to biodiversity under the implementation of the Common Agricultural Policy (CAP)
- 4c.2 Enhance and encourage the role of farmers as biodiversity actors
- 4c.3 Promote agricultural diversification
- 4c.4 Promote the integration of biodiversity into rural development
- 4c.5 Promote the sustainable use of genetic resources for food, and agriculture
- 4c.6 Reduce the impacts of pesticides on biodiversity and ecosystem services
- 4c.7 Prevent cultivated GMOs from leading to the loss, displacement or genetic introgression into local agricultural varieties and related wild flora and prevent them from affecting the surrounding natural biodiversity
- 4c.8 Ensure that the production of plants, inter alia non indigenous plants, for renewable energy does not negatively impact on biodiversity
4d) Fishery in marine and inland waters
- 4d.1 Promote the implementation of good fishing practices in the North Sea, favourable to fish protection and their habitats, including the implementation of the Common Fishery Policy
- 4d.2 Ensure that recreational and sport fishing practices at sea and inland waters respond to ecological management objectives to avoid adverse impacts on biodiversity
- 4d.3 Prevent GM fish from threatening marine and freshwater biodiversity and populations
4g) Hunting
- 4g.1 Promote integrated management of hunting grounds in cooperation with farmers, foresters and environmental NGOs and the application of good hunting practices
- 4g.2 Promote the involvement of hunters as biodiversity actors
- 4g.3 Promote stability within the hunting sector

83. **What future actions have been planned to support your country's efforts in addressing Aichi Targets as they may apply to the conservation and sustainable use of biodiversity for food and agriculture in your country?**

(The answer to question 83 is added in the text field of question 82, because of a resticted number of characters in this text field.)

84. **Is your country involved in the implementation of regional and/or international initiatives targeting the conservation and sustainable use of associated biodiversity? List initiatives in Table 29.**

Table 29. Regional and/or international initiatives targeting the conservation and sustainable use of associated biodiversity.

Initiatives	Scope (R: regional, I: international)	Description	References

Initiatives	Scope (R: regional, I: international)	Description	References
European hamster breeding programme	I	Breeding European hamsters for reintroduction with attention to genetics, origin, …	http://www.natuurenbos.be/nl-BE/natuurbeleid/soortenbeleid/bescherming/soorten/zoogdieren/europese_hamster/maatregelen
Ex situ conservation of biodiversity	I	Belgium takes part in several international initiatives aiming to cooperate in the area of ex situ conservation (i.e. Belgian Coordinated Collections of Micro-organisms, the International Association of Zoos, Botanic Gardens Conservation International, the International Treaty on Plant Genetic Resources for Food and Agriculture, the European Cooperative Programme for Plant Genetic Resources (ECPGR & AEGIS) and the Global Strategy for Plant Conservation).).	National Biodiversity Strategy
Integrated Pest Management (IPM)	R	EU and Belgian regional legislation on IPM with the aim to protect the environment and conserve biodiversity and+ the workshops and lectures given by the governments for the farmers (sensibilisation activities))	Flanders: Decree of the Flemish Government concerning the application of integrated pest management by professional users of pesticides Wallonia: Wallonia public services Decree of 10 July 2013 establishing a framework to achieve pesticide use that is compatible with sustainable development

Initiatives	Scope (R: regional, I: international)	Description	References
N2000	I	Natura 2000 Network Protection of natural habitats and species	Birds directive from (1979) and Habitats Directive from (1992). Walloon and Flemish legislation implementing these directives.
Interreg IV European projects	I	Hainaut Cross-Border Nature Park	Through joint initiatives and cross-border actions, the Hainaut Cross-Border Nature Park, established on both French and Belgian soil, combines the management of natural habitats and the development of environmental public awareness and education schemes.
Interreg IV European project	I	Transbiofruit	Producers and support organisations in the two regions (France and Wallonia) have teamed together to stimulate and develop expertise, experience and innovation in addressing organic fruit production issues in the cross-border area.

Initiatives	Scope (R: regional, I: international)	Description	References
Publicly-owned Walloon forest is PEFC certified	I	PEFC	The PEFC standard is an international system of certification guaranteeing sustainable forest management. It meets the highest standards of forestry certification, in line with the majority of governments worldwide, including: • Maintenance or improvement of biodiversity • Protection of forested areas of ecological importance • Banned use of most chemicals, GMOs and hazardous pesticides

Add row
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Capacity development

85. **What training and extension programmes, or elements of programmes, at all levels, exist that target the conservation and sustainable use of associated biodiversity?**

Implementation of the National Biodiversity Strategy: Trainings on biodiversity are organized at different levels. At the federal level, training cycles are provided, in partnership with the CBD National Focal Point team, to: the "underwriters" of the Ducroire / Delcredere (Belgian Export credit agency, 2010-2011), the Federal Directorate General for Development Cooperation (2011), the members of the SNCB Group (B-holding, Infrabel, Tucrail, Eurostation) (2012), the Maritime Transport and the DG for the Environment (2012), the EMAS federal network coordinating the environmental management of the federal institutions (2012), the FPS Economy (2012), the FPS for Public Health, Food Security and Environment (2014), and the secondary school teachers (yearly from 2011 to 2014). The training workshops are especially adapted to the needs of the participants with a special focus on their professional activities (Fifth National Report to the CBD).

Organisations organising education and training programmes for farmers, may devote (part of) a training programme to biodiversity. Examples of such organisations are:

Landwijzer vzw:
specialized training center for organic and biodynamic agriculture and nutritional habits in Flanders. They offer education, training, courses and coaching (www.landwijzer.be)

Nationaal Agrarisch Centrum (NAC) vzw:
Agricultural training center offering a course on organic agriculture (http://www.nacvzw.be/nl/opleiding/p/27/biologische-landbouw-biologische-landbouw)

Inagro vzw:
Inagro regularly organizes activities for farmers (training, workshops, etc) that directly or indirectly target biodiversity (organic agriculture, IPM, bees, agroforestry, …) (www.inagro.be)

Kenniscirkel + forum Boer en Natuur -2010/2011:
Collection of knowledge on how farmers can bring biodiversity into practice in their business. Forum is no longer online because its website was hacked. The forum also contained digital courses on the topic
http://www.natuurenbos.be/nl-BE/Nieuws/2010/100831_boerennatuur_be

Plantentuin Meise:
The botanical garden organizes educational activities (for primary and secondary schools, bachelor / master) during which the students talk about biodiversity.
www.botanicgarden.be

ARGUS (environment centre established by KBC and Cera):
ARGUS informs on a sustainable, environmentally friendly society. ARGUS provides for information and invests in awareness projects. At Argus News (news site) and the Argus magazine, biodiversity is an important topic.
http://www.argusactueel.be/tags/biodiversiteit http://www.argusmilieu.be/uploads/documentenbank/24c53483f92d27d74f32b2ea12601290.pdf

PNEC De Kaaihoeve:
Pupils (and teachers) learn about the role biodiversity plays in our day-to-day life and why biodiversity should be safeguarded.
http://nme.milieuinfo.be/front.cgi?action=detail&id_aanbod=6965

Wervel:
Organizes a number of training programs like:
o GMO and your own seed production: conservation of biodiversity into agriculture
o Agroforestry
o Agriculture and environment, a plea for more interaction
http://www.wervel.be/vorming-wat-doen-we-50

Museum voor Natuurwetenschappen:
Atelier – Biodiversity game http://www.natuurwetenschappen.be/educa/group/workshops/biodivgame/?searchterm=biodiversiteitAtelier – Biodiversity game

PCLT vzw (Praktijkcentrum voor land- en tuinbouw):
The orchard and its biodiversity
http://www.pclt.be/opleidingen/o/BOOMGAARD/aanplanten-en-onderhoud-van-fruitbomen

Inverde:
Organizes various training seminars in which biodiversity is a topic.
Examples
• Starting activity on community grassland and biodiversity - The main goal is to organize activities and to network. They aim at everyone who has a thrill of grassland biodiversity. http://www.inverde.be/cursus/2245
• Workshop Biodiversity in forests (2012) http://www.inverde.be/content/kennis-houtige-biomassa/4_biodiversiteit_KrisVandekerkhove_18122012.pdf
• Seminar on Phosphate and grassland biodiversity http://www.inverde.be/cursus/2249
• Managing hayland by respecting biodiversity (2014) http://www.inverde.be/cursus/529

CRIE (regional environmental awareness centres):
11 centres in Wallonia providing information to and raising awareness by the general public on environmental and sustainable development issues.
www.crie.be

GAWI (Groupement d'Arboriculteurs pratiqant en Wallonie les techniques Intégrées / Organisation of Walloon Fruit growers who apply the Integrated Techniques):
Training arboriculturists in integrated pest management as a means of conserving biodiversity

The various pilot centres:
The pilot centres regularly organise activities for farmers (training, workshops, etc.) that directly or indirectly target biodiversity (organic agriculture, IPM, etc.)

Aves:

The training provided as part of the phytolicence initiative:
All users of plant protection products must have a phytolicence. To obtain the licence, they must attend a training course. The programme includes a section on good agricultural practices and integrated pest management, which is directly aimed at conserving biodiversity

The various apiculture courses:
The Maya plan allows for training young apiculturists (500/yr) (http://www.wallonie.be/sites/wallonie/files/publications/maya.pdf)

Sustainable development days:
Communities, associations, businesses, authorities, educational institutions, research centres, public institutions, museums, etc. join forces to raise awareness among a wide audience (general public, young people, professionals, schoolchildren, communities, experts, etc.) about sustainable development issues, urging them to adopt environmentally friendly behaviours and offering solutions to put into practice. All aspects of sustainable development are covered, including biodiversity, climate, habitat, etc.

The actions take many forms: teaching, conferences, competitions, exhibitions, excursions, etc.

Pesticide Action Week:
To urge the general public to use effective alternatives to using synthetic pesticides and thus using and conserving biodiversity

Training courses provided to forest managers and owners:
Training courses organised by the Royal Forestry Society of Belgium for private owners and DNF (national directorate of training) internal training courses for managers of publicly-owned forest organised by Forêt Wallonne.
Training courses organised by the Union of Cities and Municipalities for municipal representatives.

86. **What higher education programmes exist that target the conservation and sustainable use of associated biodiversity genetic resources? List in Table 30 the institutions, as well as the programmes and enrolment, disaggregated by sex, if possible**.

Table 30. Higher education programmes specifically targeting the conservation and sustainable use of associated biodiversity genetic resources in the country.

Institution	**Programme**	**Level**	**Enrolment** (total)	**Enrolment** (male)	**Enrolment** (female)

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Katholieke Universiteit Leuven (KULeuven	Bioscience - Engineering: In the course Ecology, students gain an insight into the relationship between organisms and their environment. The students acquire knowledge on the physical, chemical and biological factors and learn about the interactions that determine the dissemination and abundance of different types of organisms and their presence on earth. The students learn about the main concepts used in ecology, both at the level of organisms, populations and communities. In the Master's programm, students can choose various specializations, including land and forest management, agronomy, ... http://onderwijsaanbod.kuleuven.be/	Bachelor and Master			
Katholieke Universiteit Leuven (KULeuven)	Biology: This training programme includes ecology, evolution, biodiversity, cell biology, molecular biology and functional biology. "We must never forget how important biodiversity is for us as a society. We use ecosystem services all the time." http://onderwijsaanbod.kuleuven.be	Bachelor and Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Katholieke Universiteit Leuven (KULeuven)	Master of Tropical Natural Resources Management. The program is structured around three areas that are important for improving our food security and reducing poverty: agricultural biodiversity, economy and policy of natural resources soil conservation. In the major Agro-biodiversity, students learn how tropical plants with an important value are collected and preserved and how they can be used for sustainable development. http://www.biw.kuleuven.be/studenten/Tbach/opl_master.aspx#earth	Master			
Katholieke Universiteit Leuven (KULeuven)	Geography, major terrestrial ecosystems and global change. The focus is on the study of natural processes which make up the environment. It focuses on the interaction between atmosphere, oceans and ice caps, terrestrial ecosystems and the evolution of these systems, both globally and locally, naturally and under the influence of man. http://onderwijsaanbod.kuleuven.be/	Bachelor and Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Katholieke Universiteit Leuven (KULeuven)	Lectures Lifelong Learning about the Environment. These lectures allow the student to get an insight into the various forms of sustainable development. They also provide insight into the necessity, complexity and potential of sustainable development in various sectors: product development, energy, construction, agriculture, manufacturing, waste management and transportation.http://www.kuleuven.be/lerenvoorleefmilieu/				
Ghent University (UGent)	Bioscience engineering: biodiversity is integrated in various courses, among which sustainable production systems and ecology. Majors are for instance forest and nature management, agricultural science, … http://studiegids.ugent.be/	Bachelor and Master			
Katholieke Universiteit Leuven	Biology: This training programme includes ecology, evolution, biodiversity, cell biology, molecular biology and functional biology. "We must never forget how important biodiversity is for us as a society. We use ecosystem services all the time." http://onderwijsaanbod.kuleuven.be	Bachelor and Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Ghent University (UGent)	Biology: several subjects deal with biodiversity: plant biodiversity, ecology, vertebrate biodiversity, invertebrate biodiversity, population ecology, community and ecosystem ecology, nature conservation and biodiversity law. During the master program, students can choose the major biodiversity and evolutionary biology. http://studiegids.ugent.be/	Bachelor and Master			
Ghent University (UGent)	Industrial sciences, major biochemical engineering. Subjects are macro-ecology and ecotechnology. http://studiegids.ugent.be/	Bachelor and Master			
Ghent University (UGent)	Science in Environmental Technology and Engineering. Biodiversiteit is incorporated in these subjects: Introduction to Environmental Science III, Environmental Ecology. http://studiegids.ugent.be/2014/NL/FACULTY/I/MABA/IMIMET/IMIMET.html	International master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Ghent University (UGent)	Science in Rural Development. Apply theories and methodological approaches to characterize and analyze program specific problems, such as: food, nutrition, food sovereignty, food safety and security, natural resource management, sustainable production, economic and social problems of rural areas, national and international agriculture,.... http://www.imrd.ugent.be/index.asp?p=2055&a=61	International master			
Vrije Universiteit Brussel (VUB)	Biology, major Biodiversity and Ecosystems. This training programme allows students to acquire a thorough understanding of the links between fauna and flora in the different ecosystems of the world, how they originated and how they are threatened. http://www.vub.ac.be/infoover/onderwijs/	Bachelor and Master			
Vrije Universiteit Brussel (VUB)	Geography. Geography can be described as a multi-faceted, interdisciplinary science focussing on the environment and sustainable use of space. http://www.vub.ac.be/infoover/onderwijs/	Bachelor and Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Vrije Universiteit Brussel (VUB)	Science in Physical Land. Sustainable use of land and link to sustainable agriculture. http://www.vub.ac.be/english/infoabout/education/	Master			
University of Antwerp (UAntwerpen)	Biology, major preservation and restoration of biodiversity. The focus is on the global biodiversity crisis. The student gets information on the causes and effects of the extinction of plant and animal species worldwide, and the theory and practice of management of threatened species and the preservation and restoration of habitats. https://www.uantwerpen.be/nl/onderwijs/	Bachelor and Master			
Katholieke Universiteit Leuven	Master of Tropical Natural Resources Management. The program is structured around three areas that are important for improving our food security and reducing poverty: agricultural biodiversity, economy and policy of natural resources soil conservation. In the major Agro-biodiversity, students learn how tropical plants with an important value are collected and preserved and how they can be used for sustainable development. http://www.biw.kuleuven.be/studenten/Tbach/opl_master.aspx#earth	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Ghent University	Industrial sciences, major biochemical engineering. Subjects are macro-ecology and ecotechnology. http://studiegids.ugent.be/	Bachelor and Master			
Katholieke Universiteit Leuven	Geography, major terrestrial ecosystems and global change. The focus is on the study of natural processes which make up the environment. It focuses on the interaction between atmosphere, oceans and ice caps, terrestrial ecosystems and the evolution of these systems, both globally and locally, naturally and under the influence of man. http://onderwijsaanbod.kuleuven.be/	Bachelor and Master			
Vrije Universiteit Brussel	Geography. Geography can be described as a multi-faceted, interdisciplinary science focussing on the environment and sustainable use of space. http://www.vub.ac.be/infoover/onderwijs/	Bachelor and Master			
Ghent University	Science in Environmental Technology and Engineering. Biodiversiteit is incorporated in these subjects: Introduction to Environmental Science III, Environmental Ecology. http://studiegids.ugent.be/2014/NL/FACULTY/I/MABA/IMIMET/IMIMET.html	International master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Ghent University	Science in Rural Development. Apply theories and methodological approaches to characterize and analyze program specific problems, such as: food, nutrition, food sovereignty, food safety and security, natural resource management, sustainable production, economic and social problems of rural areas, national and international agriculture,.... http://www.imrd.ugent.be/index.asp?p=2055&a=61	International master			
Vrije Universiteit Brussel	Science in Physical Land. Sustainable use of land and link to sustainable agriculture. http://www.vub.ac.be/english/infoabout/education/	Master			
Hogeschool Gent (HoGent)	Agro- and biotechnology with major agriculture. This training programme goes deeper into the maintenance of nature and bio-diversity along with the broadening of the agricultural objectives. http://fnt.hogent.be/opleidingen/agro-en-biotechnologie/landbouw/http://fnt.hogent.be/opleidingen/agro-en-biotechnologie/landbouw/	Bachelor			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Katholieke Universiteit Leuven	Lectures Lifelong Learning about the Environment. These lectures allow the student to get an insight into the various forms of sustainable development. They also provide insight into the necessity, complexity and potential of sustainable development in various sectors: product development, energy, construction, agriculture, manufacturing, waste management and transportation.http://www.kuleuven.be/lerenvoorleefmilieu/				
University of Liège (ULg)	Bioengineer (Agricultural engineer) http://www.gembloux.ulg.ac.be/etudier/une-formation-complete-de-bioingenieur-5-ans/ Bioengineer (Agricultural engineer) http://www.gembloux.ulg.ac.be/etudier/une-formation-complete-de-bioingenieur-5-ans/	Bachelor and master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
University of Liège (ULg)	Bioengineering: environmental sciences and technology. Bioengineers ensure that natural resources are managed responsibly, both in temperate and tropical climates. As part of their course, these engineers learn to assess, to establish models of, to make use of, to manage, to develop and to restore natural resources, the environment and rural and peri-urban areas, in compliance with sustainable development principles. http://www.gembloux.ulg.ac.be/etudier/offre-de-formation/masters-bioingenieur/ste/	Master			
University of Liège (ULg)	Bioengineering: management of forests and natural areas. Bioengineers are trained to address major global issues like deforestation, biodiversity erosion and climate change, etc. By doing so, they contribute to leveraging the goods and services that ecosystems provide, for the benefit of everyone and of local populations in particular.	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
University of Liège (ULg)	Bioengineering: management of forests and natural areas. Bioengineers are trained to address major global issues like deforestation, biodiversity erosion and climate change, etc. By doing so, they contribute to leveraging the goods and services that ecosystems provide, for the benefit of everyone and of local populations in particular.	Master			
University of Liège (ULg)	Plant and animal resources management in tropical environments http://progcours.ulg.ac.be/cocoon/programmes/VHTROP01.htmlhttp://progcours.ulg.ac.be/cocoon/programmes/VHTROP01.html	Complementary Master			
University of Liège (ULg)	Environmental risk management http://progcours.ulg.ac.be/cocoon/programmes/SHGRIS01.html	Complementary Master			
University of Liège (ULg)	Science and Environmental Management in developing countries	Complementary Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Catholic University of Leuven (UCL, Louvain-la-Neuve)	Forests and natural areas engineering. The programme aims to train bioengineers in the fields of management, protection and rational and sustainable use of forests and natural areas in the various ecological and socio-economic contexts. http://www.uclouvain.be/programmes-etudes.html	Master			
Catholic University of Leuven (UCL, Louvain-la-Neuve)	Agricultural Bioengineering. This master's degree produces bioengineers specialised in sustainable livestock and crop production that is both environmentally friendly and food safety-conscious. http://www.uclouvain.be/programmes-etudes.html	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Catholic University of Leuven (UCL, Louvain-la-Neuve)	Bioengineering: environmental sciences and technology. The programme provides the necessary skills and knowledge to become • A professional capable of analysing and diagnosing environmental problems: management and optimal use of resources (land, water, vegetation) and ecosystems, local development; • An innovator called on to design new environmentally-friendly resource management methods; • etc. http://www.uclouvain.be/programmes-etudes.html	Master			
Catholic University of Leuven (UCL, Louvain-la-Neuve)	Environmental sciences and management. This master's degree trains students in interdisciplinary dialogue (economic, environmental, ethical, societal and technical aspects as part of a systemic approach), as well as in decision making and acting on environmental and sustainable development issues. This course thus provides a solid base covering aspects associated with the natural sciences in relation it the environment, but it also includes the economic, social, demographic, legal and political aspects. http://www.uclouvain.be/programmes-etudes.html	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Catholic University of Leuven (UCL, Louvain-la-Neuve) + University of Namur	Biology of organisms and ecology. Specialist training in various fields of organismal biology and ecology, including both terrestrial and aquatic environments, long studied separately. The programme offers a fundamental approach to ecology, combined with an in-depth study of techniques; the skills necessary to understanding and taking action on environmental and biodiversity problems http://www.uclouvain.be/programmes-etudes.html	Master			
University of Mons (UMONS)	Biology of organisms and ecology. This master's degree provides training based on sound scientific principles through participation in the of the UMONS Biology department, which conducts research in microbiology, proteomics, marine biology, aquaculture, ecophysiology, entomology and ecology	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Free University of Brussels (ULB)	Biology of organisms and ecology The scope of organismal biology and ecology covers all the diversity of living organisms, but also the relationship between those organisms and the environment and/or with humans. Organismal biologists are the witnesses, defenders, decipherers and managers of our planet's biological heritage, which is currently seriously threatened by human activities. http://banssbfr.ulb.ac.be/PROD_frFR/bzscrse.p_prog_catalog	Master			
Free University of Brussels (ULB)	Environmental Bioengineering. This course meets objectives that have developed out of a societal need, one that is progressive and marked by the constant expansion of bioengineering applications. The focus is on environmental management, agricultural ecosystems and all industrial operations involving living organisms.	Master			

Institution	Programme	Level	Enrolment (total)	Enrolment (male)	Enrolment (female)
Free University of Brussels (ULB)	Master in Agricultural Bioengineering.Master in Agricultural Bioengineering. The programme is centred on sustainable management of agricultural ecosystems of rural areas regardless of the pedoclimate. It covers crop and livestock production, incorporating society's recent demands concerning product quality, environmental risks and the risks involved in conserving biodiversity. It also provides tools for integrated management of rural areas and natural habitat, by assessing the impact of human activities on ecological processes on a number of levels	Master			
Haute Ecole Charlemagne (Gembloux-Huy)	Sciences de l'ingénieur industriel en agronomie (industrial engineering majoring in agronomy) Ecologie et gestion environnementale (ecology and environmental management)	Master			
Haute Ecole Condorcet (Ath)	Sciences de l'ingénieur industriel en agronomie	Master			
Haute école de la province de Namur (Ciney)	Agronomy	Bachelor			
Higher Education Institution of the Province of Liège (La Reid)	Agronomy	Bachelor			

Add row

Delete row

87. List up to 10 major institutions within your country directly involved in research on the conservation and sustainable use of associated biodiversity. Provide a concise description of the institutions, of their key research programmes and, where possible, provide the number of active researchers.

• Royal Belgian Institute of Natural Sciences (https://www.naturalsciences.be/en)
• Belgian Universities:
- Katholieke Universiteit Leuven (www.kuleuven.be),
- Ghent University (www.ugent.be)
- University of Antwerp (www.uantwerpen.be)

- Vrije Universiteit Brussel (www.vub.be)
- Université de Liège (www.ulg.ac.be) et Gembloux Agro-Bio Tech (www.gembloux.ulg.ac.be)
- Université Catholique de Louvain (www.uclouvain.be)
- Université Libre de Bruxelles (ULB) (www.ulb.ac.be)
- Université de Mons (www.umons.ac.be)
- UNamur (https://www.unamur.be/)
• Botanic Garden Meise (www.botanicgarden.be)
• Flanders Marine Institute, Platform for Marine Research (VLIZ, Vlaams Instituut voor de Zee, http://www.vliz.be/en)
• Research Institute for Nature and Forest (INBO, Instituut voor Natuur en Bosonderzoek, https://www.inbo.be/en)
• Institute for Agricultural and Fisheries Research (ILVO, Instituut voor Landbouw- en Visserijonderzoek, http://www.ilvo.vlaanderen.be)
• Natural and Agricultural Environmental Studies Department (DEMNA) http://environnement.wallonie.be/cgi/dgrne/plateforme_dgrne/visiteur/v2/fr
• Walloon Agricultural Research Centre (CRA-W, http://www.cra.wallonie.be)

Knowledge generation and science for the management and sustainable use of biodiversity for food and agriculture

88. **With respect to information management, national policies, programmes and enabling frameworks that support or influence the conservation and sustainable use of biodiversity for food and agriculture and the provision of ecosystem services, and govern exchange, access and benefits:**
   a. What are the major gaps in information and knowledge?
   b. What are the main capacity or resources limitations?
   c. What are the main policy and institutional constraints?
   d. What actions are required and what would be the priorities?

No information available.

89. **With respect to stakeholder participation and ongoing activities that support maintenance of biodiversity for food and agriculture and collaboration between institutions and organizations:**
   a. What are the major gaps in information and knowledge?
   b. What are the main capacity or resources limitations?
   c. What are the main policy and institutional constraints?
   d. What actions are required and what would be the priorities?

No information available.

90. **With respect to capacity development:**
   a. What are the major gaps in information and knowledge?
   b. What are the main capacity or resources limitations?
   c. What are the main policy and institutional constraints?
   d. What actions are required and what would be the priorities?

No information available.

91. **With respect to knowledge generation and science for the management and sustainable use of biodiversity for food and agriculture:**
   a. What are the major gaps in information and knowledge?
   b. What are the main capacity or resources limitations?
   c. What are the main policy and institutional constraints?
   d. What actions are required and what would be the priorities?

acd. No information
b. Financial resources from governments and the dedication of personnel to do research, monitoring, actions and projects filling gaps are always limited (times of cuts/savings); governments made priorities/choices (federal/regional).

CHAPTER 6: Future agendas for conservation and sustainable use of biodiversity for food and agriculture

Proposed structure of the chapter and information to be included in the Country Reports

This chapter provides an opportunity to describe plans and priorities to secure and improve the conservation and sustainable use of biodiversity for food and agriculture. Particular attention should be given to future opportunities to enhance the contribution of biodiversity for food and agriculture to food security and nutrition, as well as the elimination of rural poverty. Planned actions and initiatives should be listed that intend to support the following:

- Strengthening the contribution of biodiversity for food and agriculture to secure the multiple benefits of agriculture, including food security and nutrition, rural development, sustainable intensification, and the enhanced sustainability and resilience of production systems;
- Improving recognition and involvement of farmers, pastoralists, fishers and forest dwellers, addressing gender equality, and supporting the roles and contributions of women;
- Contributing to the UN Strategic Plan for Biodiversity and to achieving the Aichi Targets and linking to other related processes undertaken through the Convention on Biological Diversity.

Additionally, Chapter 6 allows an assessment of future needs with respect to policies and legal arrangements, economic frameworks, knowledge creation, capacity development and collaboration.

This part of the Country Report should build on the results presented in earlier Chapters and provide an integrated overview with, where possible, clear priorities for national, regional or global actions. This chapter is structured to benefit countries through an overall synthesis of information provided elsewhere in the report. Countries that previously presented or are currently preparing a Country Report on Forest, Aquatic, Animal or Plant Genetic Resources, may wish to take full advantage of their different sectoral reports to identify an overall perspective.

Enhancing the contribution of biodiversity for food and agriculture

This section provides an opportunity for countries to highlight their plans and priorities, and to describe current constraints to achieving them on enhancing the contribution of biodiversity for food and agriculture to human wellbeing, environmental health and sustainable production. Include any information that might be useful in informing future policies to help strengthen the contribution of biodiversity for food and agriculture to the broader sustainability and development objectives listed below.

92. **Describe planned actions and future priorities to improve the conservation and sustainable use of biodiversity for food and agriculture with specific reference to enhancing its contribution to:**

a. **improving food security and nutrition;**
b. **improving rural livelihoods;**
c. **improving productivity;**
d. **supporting ecosystem function and the provision of ecosystem services;**
e. **improving the sustainability and resilience of production systems;**
f. **supporting sustainable intensification.**

Refer to the future needs and priorities identified in previous Chapters. The different topics may be dealt with jointly or individually as appropriate to country plans and approaches. Replies should include country perspectives on:

- **Ways and means of improving the capacity and operations of the institutions within your country concerned with or affected by the maintenance and use of biodiversity for food and agriculture and particularly of associated biodiversity, including universities, government programmes, NGOs, breeders, private sector entities, organizations and social movements of small-scale producers. Actions to improve collaboration between stakeholders should be included.**

- **Ways and means of supporting the development of new policies or the implementation of the current policies that support the integrated conservation and sustainable use of biodiversity for food and agriculture, and that also specifically target associated biodiversity.**

- **The major information and knowledge gaps that remain to be addressed and options that exist to address them.**

Countries should indicate the ways in which planned actions will contribute to the UN Strategic Plan for Biodiversity and to achieving the Aichi Targets In particular Targets 6, 7, 13. as well as to how they link to other related processes undertaken through the Convention on Biological Diversity.

a. Improving food security and nutrition

Food security is no real issue in Belgium, therefore no specific actions are taken with respect to this objective.

b. Improving rural livelihoods

The Rural Development Programmes 2014-2020 aim to improve the rural livelihoods through various measures.

c. Improving productivity

d. Supporting ecosystem function and the provision of ecosystem services

Launch of the platform of exchange between the regional (Walloon) administration and scientists (Cf. question 19 b).
Research project FORBIO: FORBIO Climate wants to scrutinize the adaptive capacity of tree species and predict the future performance of tree species in Belgium under different scenarios of climate change. The project will focus on oak (Quercus robur/petraea) and beech (Fagus sylvatica), two tree species with high ecological and economic significance in Belgium (and Europe). More information on: http://www.biw.kuleuven.be/lbh/lbnl/forecoman/ned/projbeschrijving.asp?n=82.
Evaluation of the genetic diversity of western honeybees (Apis mellifera L.) in Wallonia and selection of parent colonies resistant to the mite Varroa destructor. The project began in 2012 and should be completed in 2017. By the end of this project, new knowledge will have been acquired in terms of bee selection
resistant to Varroa destructor. New tools will be available for researching bee colonies resistant to Varroa destructor, and a genetic gain will be transferable to Walloon apiculture.
Flanders is working on:
• an action plan for bees and pollinators;
• actions to avoid and to fish selectively, as monitoring, research, policy measures, control and order.

e. Improving the sustainability and resilience of production systems

Flanders has an action plan on alternative protein sources, that will be evaluated and possibly renewed.
Within the Institute for Agriculture and Fisheries Research (ILVO) projects are running on agroecology and its integration into the Flemish agricultural practices (competence building for a systematic routine to support the agroecological approach.
Wallonia seeks to increase the percentage of privately-owned PEFC-certified Walloon forests.
The Mammiscan project has provided a means of managing and monitoring udder health, which helps reduce the amount of antibiotics used, thus improving the sustainability of dairy farms.

f. Supporting sustainable intensification

In the framework of “Blue Economy and Growth”, Flanders will study how the intensive use of the seas can be reconciled with the nature values of these seas.
In Wallonia, as part of integrated pest management:
- Improving and developing warning systems.
-Participation in the European project ERANET C'IPM. Most European countries are investing in research and extension to face the challenge of implementing IPM, reduce reliance on pesticides, and reduce risks associated with their use. Added value and synergies can be created by coordinating such national research and extension efforts and by pooling existing resources. To this end, C-IPM will:
• create a forum for exchange and identification of IPM research and development priorities,
• provide recommendations on national and European research,
• connect existing initiatives,
• coordinate joint transnational research calls.

Strengthening the conservation and management of associated biodiversity and wild foods

This section provides an opportunity for countries to highlight their plans and priorities, and to describe current constraints to achieving them on the conservation and management of associated biodiversity and of wild foods.

93. **Describe planned actions and future priorities to support conservation and management of the components of associated biodiversity and wild foods including the development of monitoring programmes and of information systems or databases.**

Replies should cover country perspectives on:

- **Ways and means of improving the capacity and operations of the institutions within your country concerned with or affected by the maintenance and use of biodiversity for food and agriculture and particularly of associated biodiversity, including universities, government programmes, NGOs, breeders, private sector entities, organizations and social movements of small-scale producers. Actions to improve collaboration between stakeholders should be included;**

- **Ways and means of supporting the development of new policies or the implementation of the current policies that support the integrated conservation and sustainable use of biodiversity for food and agriculture, and that also specifically target associated biodiversity;**

- **The major information and knowledge gaps that remain to be addressed and options that exist to address them.**

Objective 1 of the updated National Biodiversity Strategy is to identify and to monitor priority components of biodiversity in Belgium. Priority components of biodiversity include (1) ecosystems and habitats that are unique, rare, in danger of disappearance, or that play a crucial role for priority species; (2) species that are rare, endangered, vulnerable, or that are endemic or live in specific habitats; (3) genomes and genes of particular social, scientific or economic importance; and (4) functional components of biodiversity that are essential for the provision of ecosystem services.

Monitoring and reporting on the status of biodiversity in Belgium will need the development of suitable monitoring tools and indicators. Furthermore, Belgian authorities need to argue for an effective use of other existing European biodiversity indicators in policy on, for example, agriculture or structural funds.

The second operational objective of Objective 1 is: 1.2 Identify and monitor priority species, habitats, genetic and functional components of biodiversity.

Operational objective 3.6 of the National Biodiversity Strategy says: “Take measures to minimise the impact of the identified processes and activities threatening biodiversity and ecosystem services”. Measures should be taken to reduce the impact of processes and activities threatening biodiversity and ecosystem services, including at least habitat destruction and degradation, pollution, overexploitation, the spread of invasive alien species, the spread of some GMOs, and climate change. Particular attention should be paid to an integrated control (including trade control) of chemicals, pesticides, GMOs and alien species released into the environment. As an example, control and reduction of pollution-inducing eutrophication should be promoted. Another step could be made by implementing an integrated water management, including the North Sea coasts and an integrated coastal zone management, etc.

Objective 5 of the National Biodiversity Strategy is to improve the integration of biodiversity concerns into all relevant sectoral policies. This objective is the backbone of achieving sectoral integration of biodiversity concerns and engaging stakeholders in the delivery of the NBS.

Objective 7 of the National Biodiversity Strategy is to improve and communicate scientific knowledge on biodiversity and ecosystem services. Addressing the gaps in our knowledge on biodiversity and ecosystems will require (i) more investment and capacity-building in key biological disciplines such as taxonomy and ecology, (ii) easy and open access to biodiversity data and research information, and (iii) improvement of the coordination and communication between policy and research.

94. **Describe planned actions and future priorities with respect to implementing ecosystem approaches for the various components of biodiversity for food and agriculture.**

• Operational objective 3.2 of the updated National Biodiversity Strategy says: “At least 10 per cent of coastal and marine

areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through the development of effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and are integrated into the wider seascapes".
Coastal and Marine Protected Areas (MPAs) are an important means of safeguarding the ocean's rich diversity of life. They may support local economies by providing a refuge from fishing pressure for commercial fish stocks. If properly located and managed, MPAs may act as refuge habitats and lead to reduction in fishing mortality and bycatch.

The designation of the MPAs will be backed up by a legally binding Marine Spatial Planning (MSP) which takes into account the views of the socio-economic sectors and the Integrated Coastal Zone Management strategy.

Additionally, a programme of measures conform with the Marine Strategy Framework Directive is currently in preparation and will be submitted to the European Commission in 2015. This programme of measures will address all relevant pressures and (socio-) economic sectors to allow the recovery of degraded habitats and populations to achieve the Good Environmental Status (GES) and/or Favourable State of Conservation (FSC) by 2020

• Aquaculture: When it comes to future businesses, the Flemish government will focus on avanced 'more with less' cultivation and production systems with a positive impact on the environment and climate by reducing the environmental footprint compared to the current practice. We will also increase the positive effects from the usual practice (aquaponics or other forms of integrated aquaculture) by:
- a more efficient use of ressources
- applying the principle of a short chain
- less transport
- reducing the consumption of water, energy and ressources and using less space
- an extractive aquaculture (e.g. algal culture)
- a reduction of greenhouse gas emissions
- biotransformation
- closing cycles
- reuse of nutrients and residual current by integration.

At sea, the marine plan foresees two wind energy plants in areas where aquaculture is permitted, provided that the eutrophication of the sea water is prevented. This can be done by cultivating algae or setting up integrated systems combining food streams or waste streams between the different species.

The launch of the platform of exchange between the regional (Walloon) administration and scientists (Cf. question No. 19 b).

Improving stakeholder involvement and awareness

This section provides an opportunity for countries to highlight their plans and priorities, and to describe current constraints to achieving them with respect to stakeholder involvement in the conservation and sustainable use of biodiversity for food and agriculture with specific reference to the recognition and involvement of farmers, pastoralists, fishers and forest dwellers, addressing gender equality, and supporting the roles and contributions of women.

95. **Describe planned actions and future priorities to improve stakeholder awareness, involvement and collaboration in the conservation and sustainable use of biodiversity for food and agriculture. Include a description of the major challenges that will need to be overcome.**

(The answer to question 95 is added in the text field of question 96, because of a resticted number of characters in this text field.)

96. **Describe planned actions and future priorities to support the role of farmers, pastoralists, fisher folk, forest dwellers, and other rural men and women dependent on local ecosystems in the conservation and use of biodiversity for food and agriculture. Replies should include information on recognizing and enhancing the role of indigenous peoples. Include a description of the major challenges that will need to be overcome.**

Answer to question No. 95:
Objective 4c.2 of the National Biodiversity Strategy is to enhance and encourage the role of farmers as biodiversity actors. The role of farmers as actors for biodiversity protection through the implementation of good farming practices and technologies should be encouraged. Farmers play a key role in agro-ecosystems, protecting and enhancing the environment, biodiversity, natural resources, soil and genetic diversity (for instance, crop rotation, organic farming and set-aside of small land parcels) and maintaining the landscape and the countryside (for instance, maintenance of open environments, management of linear and

small landscape features, ecological compensation areas). In several areas, semi-natural habitats can be preserved only if appropriate farming activities are continued.
Objective 8 of the National Biodiversity Strategy is to involve the community through communication, education, public awareness and training.

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Answer to question No. 96:

Objective 4c of the National Biodiversity Strategy is to ensure and to promote the sustainable use of components of biodiversity by farmers. Reducing pressure on biodiversity from agriculture is a big challenge for farmers in Belgium because our agriculture is one of the most intensive, specialised and productive in Europe. Furthermore, farmers are currently facing serious challenges with regard to the continuation of their profession.
The stakeholders involved in the implementation of this objective are: the regional and federal authorities, farmers, agricultural research bodies, various sectors (including public health, food chain safety, agro-food, bioenergy…), universities and any association working towards the same goal as the NBS.

Objective 4c consists of eight operational objectives:
- 4c.1 Promote measures favourable to biodiversity under the implementation of the CAP
- 4c.2 Enhance and encourage the role of farmers as biodiversity actors
- 4c.3 Promote agricultural diversification
- 4c.4 Promote the integration of biodiversity into rural development
- 4c.5 Promote the sustainable use of genetic resources for food, and agriculture
- 4c.6 Reduce the impacts of pesticides on biodiversity and ecosystem services
- 4c.7 Prevent cultivated GMOs from leading to the loss, displacement or genetic introgression into local agricultural varieties and related wild flora and prevent them from affecting the surrounding natural biodiversity
- 4c.8 Ensure that the production of plants, inter alia non indigenous plants, for renewable energy does not negatively impact on biodiversity

• Objective 4d of the National Biodiversity Strategy is to ensure and to promote the sustainable use of components of biodiversity by fishery in marine and inland waters. Two important threats of marine biodiversity are the overexploitation of marine resources and the adverse effects of certain fishing methods (in particular bottom-affecting gear) employed not only by Belgian fisheries but also by fishing vessels from foreign countries active in Belgian waters. Despite the creation of several international instruments to regulate fishery and its impact on the environment, the pressure on the marine ecosystem and fish populations is still present. Besides professional fishermen, also recreational fishermen are active at sea.

An important national instrument is the Law of 20 January 1999 on the protection of the marine environment in the areas under Belgian jurisdiction. This foresees the identification and designation of marine protected areas (MPA) (among others in application of the EU Habitat and Birds Directives). Work on MPAs and threatened and declining species is also ongoing under OSPAR. Measures for MPAs to reduce the impact of bottom-affecting gear are currently being negotiated as part of the Marine Spatial Planning. An impact analysis of human activities (including fisheries) and measures in view of achieving the objective of Good Environmental Status (Marine Strategy Framework Directive) will be included in the programme of measures which is currently being prepared (to be submitted to the European Commission in 2015).

The stakeholders involved in the implementation of this objective are: fishery management bodies; owners, managers and charters of fishing vessels; the federations of fishermen, as well as fishermen, the general public and any association working towards the same goal as the NBS.
Objective 4d consists of three operational objectives:
- 4d.1 Promote the implementation of good fishing practices in the North Sea, favourable to fish protection and their habitats, including the implementation of the Common Fishery Policy
- 4d.2 Ensure that recreational and sport fishing practices at sea and inland waters respond to ecological management objectives to avoid adverse impacts on biodiversity
- 4d.3 Prevent GM fish from threatening marine and freshwater biodiversity and populations

• Objective 4f of the National Biodiversity Strategy is to ensure and to promote the sustainable use of components of biodiversity of forestry. The forestry sector plays a multi-functional role as a producer of a renewable natural resource, provider of income and employment, biodiversity manager, guarantor of in situ conservation of local tree varieties and provider of environmental services (like soil and water protection) and of recreational activities. The biodiversity of Belgian forests is threatened locally, among other things by intensive management, pollution, changes in groundwater levels, fragmentation, recreational activities and high population densities of big game species. Indirectly, they also pose a threat to the forest as a productive resource.

To ensure that the biodiversity in Belgian forests is maintained, it is necessary to work on quantitative aspects (for instance, halt deforestation and fragmentation) and qualitative aspects, and to focus on “internal measures” within the forest and nature conservation policies and practices, as well as external measures lying outside the forest sector (for example environmental quality, land-use planning). The guiding principle should be the promotion of sustainable forest management.
The improved pan-European criteria and indicators for sustainable forest management are taken into account in regional forest inventories.

The stakeholders involved in the implementation of this objective are: the federal and regional authorities, foresters, public and private forest owners, forest industries, forest groups, public procurements actors, NGOs, research institutes, universities and any association working towards the same goal as the NBS.
Objective 4f consists of four operational objectives:
- 4f.1 Promote the conservation of forest biodiversity through independent credible forest certification systems that provide a guarantee for sustainable forest management
- 4f.2 Promote nature-oriented forestry that provides a guarantee for sustainable forest management, including forest conservation
- 4f.3 Protection of forest genetic diversity
- 4f.4 Prevent GM trees from having a negative impact on forest and general biodiversity

• Objective 4g of the National Biodiversity Strategy is to ensure and to promote the sustainable use of components of biodiversity in the hunting sector. Belgian hunting was regulated by a law of 1882 but is now a full competence of the Regions, with different regulations in Flanders, Wallonia, and Brussels-Capital Region. These laws differ between the Regions to better fit the respective game situations. The law of 1882 was first revised by the Regions in the 1990s* in order to obtain a sustainable use of wild species and their habitats. In Brussels-Capital Region, hunting is completely prohibited since 1991. Since the 1990s, modifications of Walloon and Flemish laws on hunting, along with efforts from hunters, aim to a sustainable use of wild species and their habitats.

Specific efforts still need to be done to avoid harmful behaviour that can have an impact on biodiversity by individual hunters and landowners. The hunting sector still needs proactive policy initiatives with a vision on the long term to contribute to the objective of halting the loss of biodiversity in Belgium. The stakeholders involved in the implementation of this objective are: the federal and regional authorities, farmers, foresters, hunters, hunting organizations, environmental NGOs, land owners, landscape and land use planning departments and any association working towards the same goal as the NBS.
Objective 4g consists of three operational objectives:
- 4g.1 Promote integrated management of hunting grounds in cooperation with farmers, foresters and environmental NGOs and the application of good hunting practices
- 4g.2 Promote the involvement of hunters as biodiversity actors
- 4g.3 Promote stability within the hunting sector

*Flanders: Flemish Parliament Act on Hunting of 24 July 1991; Wallonia: Act of 1882 revised by act of 14 July 1994; Brussels: Order of 29 August related to the conservation of wild fauna and to hunting.

97. **Describe planned actions and future priorities to improve recognition of the contribution of women to the conservation and use of the different components of biodiversity for food and agriculture, including associated biodiversity. Include a description of the major challenges that will need to be overcome.**

No actions/priorities specifically focussing on gender/women.

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ANNEX 1: Recommended scope of the Country Report

Biodiversity for food and agriculture

Biodiversity for food and agriculture includes the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the ecosystem structures, functions and processes in and around production systems, and that provide food and non-food agriculture products. Production systems, as defined for the purposes of this report, include the livestock, crop, fisheries and aquaculture and forest sectors. The diversity found in and around production systems has been managed or influenced by farmers, pastoralists, forest dwellers and fisherfolk over many hundreds of generations and reflects the diversity of both human activities and natural processes.

The present Guidelines for the SoWBFA mainly focus on those areas not covered by completed or on-going Country Reports on Animal, Forest, Plant and Aquatic Genetic Resources, e.g. the biological diversity associated with different supporting and regulating ecosystem services within production systems or of importance to them, referred to hereinafter as associated biodiversity, and wild resources used for food.

Associated biodiversity

For the scope of this report, associated biodiversity comprises those species of importance to ecosystem function, for example, through pollination, control of plant, animal and aquatic pests, soil formation and health, water provision and quality, etc., including *inter alia*:

a) Micro-organisms (including bacteria, viruses and protists) and fungi in and around production systems of importance to use and production such as mycorrhizal fungi, soil microbes, planktonic microbes, and rumen microbes;

b) Invertebrates, including insects, spiders, worms, and all other invertebrates that are of importance to crop, animal, fish and forest production in different ways, including as decomposers, pests, pollinators, and predators, in and around production systems;

c) Vertebrates, including amphibians, reptiles, and wild (non-domesticated) birds and mammals, including wild relatives, of importance to crop, animal, fish and forest production as pests, predators, pollinators or in other ways, in and around production systems;

d) Wild and cultivated terrestrial and aquatic plants other than crops and crop wild relatives, in and around production areas such as hedge plants, weeds, and species present in riparian corridors, rivers, lakes and coastal marine waters that contribute indirectly to production.

Note that domesticated species may also provide ecosystem services other than provisioning ones and affect crop, animal, fish and forest production in different ways. However since these species are already addressed in other State of the World Reports, countries may choose whether or not they want to include them in their Country Reports for the SoWBFA.

Integrated analysis of biodiversity for food and agriculture

The scope of the Report builds upon the contribution of individual sector reports by providing an integrative analysis of interactions, including synergies, interlinkages and trade-offs, between genetic resources of the different sectors. This is achieved through the identification of production systems within the country (Annex 2), and particular focus upon ecosystem perspectives in relation to biodiversity for food and agriculture. Questions addressing overall biodiversity for food and agriculture target information that would build upon what may be available in previous or ongoing country reports.

ANNEX 2: Production systems

Table 1. Climatic zones definitions

Climatic zone	Definition
Tropics	All months with monthly mean temperature, corrected to sea level, above 18°C.
Subtropics	One or more months with monthly mean temperatures, corrected to sea level, below 18°C but above 5 °C.
Temperate	At least one month with monthly mean temperatures, corrected to sea level, below 5 °C and four or more months above 10 °C.
Boreal	At least one month with monthly mean temperatures, corrected to sea level, below 5 °C and more than one but less than four months above 10 °C.

Table 2. Production systems descriptions

Name of production system	Climatic zone	Description
Livestock grassland-based systems	Tropics Subtropics Temperate Boreal and /or highlands[1]	Systems in which the animals obtain a large proportion of their forage intake by grazing natural or sown pastures, includes: • Ranching: grassland-based systems in which livestock is kept on privately owned rangeland • Pastoralist: grassland-based systems in which the livestock keepers move with their herds or flocks in an opportunistic way on communal land to find feed and water for their animals (either from or not from a fixed home base)
Livestock landless systems	Tropics	Systems in which livestock production is separated from the land where the feed given to the animals is produced.

[1] High elevation montane environments where climate differs significantly from surrounding lower elevation areas, including alpine and sub-alpine zones, tropical highlands, dryland mountains, etc.

	Subtropics	
	Temperate	
	Boreal and /or highlands	
Naturally regenerated forests	Tropics	Includes: • Primary: Forests of native species, where there are no clearly visible indications of human activities and the ecological processes are not directly disturbed by humans • modified natural: Forests of naturally regenerated native species where there are clearly visible indications of significant human activities • semi-natural (assisted natural regeneration): Silvicultural practices in natural forest by intensive management (weeding, fertilizing, thinning, selective logging)
	Subtropics	
	Temperate	
	Boreal	
	Boreal and /or highlands	
Planted forests	Tropics	Includes : • semi-natural (planted component) : Forests of native species, established through planting or seeding, intensively managed • Plantations (productive) : Forests of introduced and/or native species established through planting or seeding mainly for production of wood or non-wood goods • Plantations (protective) : Forests of introduced and/or native species, established through planting or seeding mainly for provision of services
	Subtropics	
	Temperate	
	Boreal	
	Boreal and /or highlands	
Self-recruiting capture fisheries	Tropics	Includes capture fisheries in marine, coastal and inland areas that can involve • Natural ecosystems • Modified ecosystems e.g. reservoirs and rice paddies;
	Subtropics	
	Temperate	
	Boreal	
Culture-based fisheries	Tropics	Fisheries on resources, the recruitment of which originates or is supplemented from cultured stocks (i.e., populations chosen for culture and not stocks in the same sense as that term is used for capture fisheries) raising total production beyond the level sustainable through natural processes.
	Subtropics	
	Temperate	
	Boreal and /or highlands	
Fed aquaculture	Tropics	The farming of aquatic organisms including fish, mollusks, crustaceans, aquatic plants, crocodiles, alligators, turtles and amphibians. Farming implies some sort of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators etc. Farming also implies individual or corporate ownership of the stock being cultivated; i.e., the population chosen for culture and not a stock in the same sense as that term is used for capture fisheries. Fed aquaculture production utilizes or has the potential to utilize aquafeeds of any type in contrast with the farming of filter-feeding invertebrates and aquatic plants that relies exclusively on natural productivity. Also defined as "farming of aquatic organisms utilizing aquafeeds in contrast to that deriving nutrition directly from nature".
	Subtropics	
	Temperate	
	Boreal and /or highlands	
Non-Fed aquaculture	Tropics	The farming of aquatic organisms including fish, mollusks, crustaceans, aquatic plants that do not need supplemental feeding. Farming implies some sort of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators etc. Farming also implies individual or corporate ownership of the stock being cultivated; i.e., the population chosen for culture and not a stock in the same sense as that term is used for capture fisheries. In non-fed aquaculture systems culture is predominately dependent on the natural environment for food, e.g. aquatic plants and mollusks.
	Subtropics	
	Temperate	
	Boreal and /or highlands	
Irrigated crops (rice)	Tropics	Irrigated rice refers to areas where rice is cultivated purposely provided with water, including land irrigated by controlled flooding.
	Subtropics	
	Temperate	
	Boreal and /or highlands	
Irrigated crops (other)	Tropics	Irrigated crops other than rice refers to agricultural areas purposely provided with water, including land irrigated by controlled flooding.
	Subtropics	
	Temperate	
	Boreal and /or highlands	

Rainfed crops	Tropics	Agricultural practice relying exclusively on rainfall as its source of water.
	Subtropics	
	Temperate	
	Boreal and /or highlands	
Mixed production systems (livestock, crop, forest and /or aquatic and fisheries mixed)	Tropics	Production systems with multiple components. They include: • Crop-livestock: mixed systems in which livestock production is integrated with crop production. • Agro-pastoralist: livestock-oriented systems that involve some crop production in addition to keeping grazing livestock on rangelands; they may involve migration with the livestock away from the cropland for part of the year; in some areas, agropastoral systems emerged from pastoral systems • Agroforestry-livestock: mixed system in which livestock production is integrated with the production of trees and shrubs[36] • Integrated aquaculture: mixed systems in which aquaculture is integrated with crop and livestock production. May involve ponds on farms, flooded fields, enrichment of ponds with organic waste, etc. • Other combinations
	Subtropics	
	Temperate	
	Boreal and /or highlands	

ANNEX 3: Drivers of change

Table 1. Drivers of change and descriptions.

Drivers	Description, Subcategories and Examples
Changes in land and water use and management	A change in the use, management and practices around land and water (e.g., deforestation; fragmentation; modification of water regimes; forest degradation; land conversion for agriculture; ecosystem restoration; the role of women and men in land and water use and management, etc.)
Pollution and external inputs	The mismanaged, excessive or inappropriate use of external inputs (e.g., over application of fertilizer and pesticides; excessive use of antibiotics or hormones; nutrient loading, including from use of imported feed; ocean acidification, CO_2 fertilization; chemical and particulate pollutants, etc.
Over-exploitation and overharvesting	Unsustainable extraction practices (e.g., overfishing; overhunting; overgrazing; logging and extractive activities exceeding replacement rates or affecting species of uncertain and at-risk conservation status, etc.)
Climate change	The impacts and effects of progressive climate change (e.g., alterations in precipitation regimes; temperature changes; loss of water supply; increased variability; sea level rise; shifts in flowering time or seasonality, etc.)
Natural disasters	Climate shocks, extreme weather events and other natural disasters that threaten agricultural production and resilience of production systems (e.g., hurricanes, earthquakes, floods, fires).
Pests, diseases, alien invasive species	New and emerging threats from pests, diseases and invasive species affecting biodiversity for food and agriculture (e.g., shifting ranges; introductions; increased suitability; loss of predator, etc.)
Markets, trade and the private sector	**Trade**- Changing terms of trade, globalization of markets, commercialization of products, retailing, the separate capacities of women and women to commercialize products, etc. **Markets and consumption** - Demand driven changes in production or practices including the tastes, values or ethics of consumers that may impact directly or indirectly biodiversity for food and agriculture, product quantity or quality **Private sector** - The changing role and influence of private sector and corporate interests
Policies	**Policies** - Global, regional, national, and subnational legislation and regulations (e.g., conservation regulations, participation and compliance with International treaties and conventions); **Economic and policy interventions** - Interventions that impact biodiversity for food and agriculture directly or indirectly (e.g., taxes, subsidies, charges for resource use, payments for ecosystem services) **Intellectual Property Rights (IPR), Access and Benefit Sharing (ABS)** - Direct or indirect impacts of IPR and ABS policy and regulations on biodiversity for food and agriculture.
Population growth and urbanization	**Population** - Changes in population metrics (e.g., growth, fertility, composition, mortality, migration, health and disease, including different affects on men and women.) **Urbanization**- (e.g., shifts in proportion of urban and rural; change in urbanization trends, including different effects on men and women)
Changing economic, socio-political, and cultural factors	**Economic development** - A change in economic circumstances of countries, industries, households (e.g., change in GDP and economic growth; structural change of economy; income diversification, and the different economic circumstances of men and women.) **Changing socio-political, cultural or religious factors** - Variation in the forces influencing decision-making of men and women, e.g., public participation, shifts in the influence of the state vs. private sector, changes in levels of education and knowledge, shifts in the beliefs, values and norms held by a group of people. **Participatory actions** – the role of collective action toward conservation and use of biodiversity by stakeholders
Advancements and innovations in science and technology	The development and diffusion of scientific knowledge and technologies, (e.g., advances in breeding; improvements in mobile extension; tools for monitoring; biotechnology applications, access of men and women to information).

ANNEX 4: Ecosystem services

The SoWBFA Guidelines focus primarily on regulating and supporting ecosystem services, described below. Provisioning services relating to biodiversity for food and agriculture are the focus of sectoral State of the World Reports, and are addressed in these guidelines only in relation to associated biodiversity and wild foods, which often fall outside of traditional sectoral reporting. Countries may choose to address additional ecosystem services, including cultural services, for the completion of national reports, particularly where they are directly relevant to the objectives of the SoWBFA Report[2].

Table 1. Regulating and supporting ecosystem services.

Category	Ecosystem services	Description	Relevant ecosystem functions
Regulating services	Pollination	Role ecosystems play in transferring pollen from male to female flower parts	Agricultural productivity; production of food and goods.
	Pest and disease regulation	Influence ecosystems have on the prevalence of crop and livestock pests and diseases	Biological control; the maintenance and feedback mechanisms preventing outbreaks of pests and diseases, including invasive species.
	Water purification and waste treatment	Role ecosystems play in the filtration and decomposition of organic wastes and pollutants in water; assimilation and detoxification of compounds through soil and subsoil processes	Filtering function performed by vegetation cover, soil and aquatic biota.
	Natural hazard regulation	Capacity for ecosystems to ameliorate and reduce the damage caused by natural disasters	Vegetative structure can alter potentially catastrophic effects of storms, floods and droughts through its storage capacity and surface resistance; coral reefs buffer waves and protect adjacent coastlines from storm damage. The services provided by this function relate to providing safety of human life and human constructions.
Supporting services	Nutrient cycling	Flow of nutrients (e.g., nitrogen, sulfur, phosphorus, carbon) through ecosystems	Maintenance of fertility; regulation of excess nutrients; climate regulation; regulation of biotic communities
	Soil formation and protection	Degradation of ecosystems, such as decomposition of organisms or weathering of substrate, to form soil	Maintenance of crop productivity on cultivated lands and the integrity and functioning of natural ecosystems.
	Water cycling	Flow of water through ecosystems in its solid, liquid, or gaseous forms	Regulation of hydrological flows at the earth surface. Maintenance of natural irrigation and drainage, buffering of extremes in discharge of rivers, regulation of channel flow, and provision of a medium for transportation.
	Habitat provisioning	Role of ecosystems in creating and maintaining habitats for a wide variety of organisms	Providing diverse and suitable habitats for species; nursery function for migratory species and as breeding areas.
	Production of oxygen/ Gas regulation	The creation of atmospheric oxygen through photosynthesis	Gas regulation functions include the maintenance of clean, breathable air, and the prevention of diseases (e.g. skin cancer, asthma) May include regulation of the CO_2/O_2 balance, maintaining ozone-layer (O_3), and regulation of SOx levels.

ANNEX 5: Management practices supporting the use and conservation of biodiversity for food and agriculture

Table 1. Management practices supporting the use and conservation of biodiversity for food and agriculture.

Management practices supporting the use and conservation of biodiversity for food and agriculture	Description/ examples of management practices
Integrated Plant Nutrient Management (IPNM)	Soil, nutrient, water, crop, and vegetation management practices undertaken with the aim of improving and sustaining soil fertility and land productivity and reducing environmental degradation, often tailored to a particular cropping and farming system. May include the use of farmyard manures, natural and mineral fertilizers, soil amendments, crop residues and farm wastes, agroforestry and tillage practices, green manures, cover crops, legumes, intercropping, crop rotations, fallows, irrigation, drainage, plus a variety of other agronomic, vegetative and structural measures designed to conserve both water and soil.
Integrated Pest Management (IPM)	Pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment by encouraging natural pest control mechanisms that include: crop rotation; inter-cropping; seedbed sanitation, sowing dates and densities, under-sowing, conservation tillage, pruning and direct sowing; where appropriate, use of pest resistant/tolerant cultivars, push-pull strategies and standard/certified seed and planting material; balanced soil fertility and water management, making optimum use of organic matter; prevent spreading of harmful organisms by field sanitation and hygiene measures; protection and enhancement of important beneficial organisms.
Pollination management	Practices that accomplish or enhance pollination of a crop, to improve yield or quality, by understanding of the particular crop's pollination needs, and by knowledgeable management of pollenizers, pollinators, and

[2] Including those described in the Millennium Ecosystem Assessment, or subsequent adaptations by the TEEB or other sources.

	pollination conditions. Pollinator-friendly practices include minimizing the use of agrochemicals, integrated pest management and mixed cropping to include pollinator friendly crops, preserving wild habitats, maintaining flower-rich field margins, buffer zones and permanent hedgerows to ensure habitat and forage, cultivating shade trees, managing for bee nest sites, and establishing landscape configurations that favor pollination services.
Landscape management	Practices that support the maintenance of biodiversity friendly farming systems, or the diversity of landscape mosaics within and surrounding production systems over particular geographic areas. Examples include riparian corridors, hedges, margins, woodland patches, clearings in forests, ponds or other biodiversity friendly features characteristic of the production environment that may be the result of national or regional policies such as the EU set aside schemes.
Sustainable soil management practices	Management of soil biodiversity to enhance agricultural production by both direct and indirect means, including alteration of the abundance or activity of specific groups of organisms through inoculation and/or direct manipulation of soil biota. Indirect interventions may include manipulation of the factors that control biotic activity (habitat structure, microclimate, nutrients and energy resources) rather than the organisms themselves such as the maintenance of soil cover with organic mulch including crop residues, green manure/cover crops including legumes, and compost to increase soil organic matter, irrigation and liming, as well as cropping system design and management.
Conservation agriculture	Conservation Agriculture (CA) aims to achieve sustainable and profitable agriculture and improve livelihoods of farmers through the application of the three CA principles: no or minimal soil disturbance through direct seeding into untilled soils, maintenance of permanent soil mulch cover, and crop diversification through rotations, associations and sequences.
Water management practices, water harvesting	Water harvesting and management through rain water retention or modification of the landscape (e.g., bunds, zais, terracing) for the restoration and improvement of degraded lands, and to allow cultivation of additional crops with higher water requirements, and improving water productivity of crops.
Agroforestry	Agroforestry is a collective name for land-use systems where woody perennials (trees, shrubs, palms, etc.) are integrated in the farming system.
Organic agriculture	Organic agriculture is a production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system.
Low external input agriculture	Production activity that uses synthetic fertilizers or pesticides below rates commonly recommended for intensive industrial tillage agriculture. It does not mean elimination of these materials. Yields are maintained through greater emphasis on agronomic practices, IPM, and utilization of on-farm resources (especially labor) and management.
Home gardens	An integrated system which comprises different components in a small area around the homestead, including staple crops, vegetables, fruits, medicinal plants, livestock and fish both for home consumption or use and for income. May include the family house, a living/playing area, a kitchen garden, a mixed garden, a fish pond, stores, an animal house, etc.
Areas designated by virtue of production features and approaches	These include areas recognized nationally or internationally by virtue of their landscape and agricultural features. In addition to Satoyama, GIAHS, national parks (IUCN categories), they also include areas recognized for specific agricultural products (e.g. DOP, IGP or Slow Food).
Ecosystem approach in capture fisheries	Approach promoting the diversity of the whole ecosystem in order to support the target species. Considerations include sustainable harvesting of the retained species (target and by-product species); managing the direct effects of fishing (especially on non-retained by-catch and habitat); and managing the indirect effects of the fishery on ecosystem structure and processes.
Conservation hatcheries	Hatcheries and production systems that optimize natural levels and organization of genetic diversity over production. Often for rebuilding depleted populations of commercially important species, (e.g. Atlantic and Pacific salmon).
Reduced-impact logging	A series of practices to improve logging practices such as vine removal, directional felling, limiting skid trails, logging roads and stumping grounds, restrictions on the size and number of trees felled, and post felling removal of waterway blockages, to reduce the residual damage, biodiversity loss and excess CO_2 emissions associated with conventional logging practices.

ANNEX 6: Diversity based interventions

Table 1. Diversity based practices and interventions

Diversity based practices	Description/ examples of interventions
Diversification	The introduction of new varieties, species, and groups of organisms (e.g., livestock, crops, trees, fish) into a production system or managed environment without replacement or abandonment of other groups, or the maintenance of already-existing diversity in the case of traditionally diverse production systems. May include introductions for restoration or IPM objectives, including fish introduced to control reproduction.
Base broadening	Increasing the amount of genetic diversity used to produce new varieties or breeds used in agricultural production.
Domestication	The development of new crop, aquatic, forest and animal species through deliberate breeding programmes or the continued selection and improvement of existing species from their wild progenitors. These activities may be carried out by national breeding programmes or by farmers and communities themselves.
Maintenance or conservation of landscape complexity	Maintenance or management of components of a landscape mosaic including hedges, waterways, road margins, corridors, windbreaks, living fences, native grasses wild patches of vegetation in the farming landscape, etc.
Restoration practices	Restoring functionality and productive capacity to ecosystems, forests, landscapes, waterways, grasslands and rangelands in order to provide food, fuel, and fiber, improve livelihoods, store carbon, improve adaptive capacity, conserve biodiversity, prevent erosion and improve water provisioning and quality.

Management of micro-organisms	The intentional incorporation, management or maintenance of microbes, fungi and other micro-organisms into a production system or organisms; e.g., inoculation of plants and seeds with arbuscular mycorrhizal fungi, the addition of probiotics in aquaculture and livestock, etc.
Polyculture/Aquaponics	Integrated multi-trophic aquaculture, utilization of different trophic and spatial niches of an aquaculture system in order to obtain maximum fish production per unit area, utilizing natural resource availability.
Swidden and shifting cultivation agriculture	Rotation of plots from intensive cultivation to extended fallow periods for the replenishment of soil fertility.
Enriched forests	Selective logging and enrichment planting to increase the abundance of useful species for food, medicine and timber, often a feature of traditional management practices.