Annex 1: Dynamics and perceptions of grassland use in Vlaamse Ardennen (Belgium)

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MOSAIC

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Abstract

This study investigates the role of drivers and farmers' motivations on grassland dynamics in the Landscape Park Vlaamse Ardennen (LVA), where grass-based livestock farming faces increasing pressure from land-use intensification. This is one of the six MOSAIC case studies that study the drivers of land-use change. Spatial analysis showed that the total grassland area declined 5.2% over 10 years, a slight decline of permanent grasslands and a gradual shift from grazing to mowing systems. This is a trend which is representative for most of the intensively farmed lowland regions of Western and Northern Europe.

Analysis of the structural drivers on grassland use in LVA combined with 22 semi-structured interviews, identified four key external drivers and three internal drivers impacting grassland management by farmers. (1) The profitability gap between grasslands and arable crops (especially potatoes) and the difference in value of such parcels incentivizes conversion of grassland, while and at the same time the adoption of technologies like milking robots shifts management from grazing to mowing and keeping cows indoors. (2) Many interviewed farmers report an 'unsupportive policyscape': there are a lot of restrictions which limit their freedom, several policy instruments are perceived as top-down and do not fit their individual farming operations, they feel uncertain due to the complexity and unclear objectives of grassland regulations, and they often report a considerable administrative workload. (3) 'New' grassland users - such as horse owners - who are rather driven by intrinsic motivations are competing for grassland. (4) Although climate change is not often mentioned spontaneously be farmers, it is recognized that it can affect grass productivity and can increase heat stress with cows. (5) While farmers primarily identify themselves as entrepreneurs driven by economic survival and optimization, (6) intrinsic values such as a love for animals and professional pride are also essential motivations for continuing their operations and maintaining specific practices like grazing. (7) Finally, the lack of labour and farm succession accelerates grassland transfer to other actors. Based on these findings, 14 potential policy intervention areas to enhance the quality and distribution of grasslands in the Landscape Park are identified. These intervention areas will drive the analysis in the upcoming report D3.2 and guide future policy recommendations.

Keywords: Grassland, livestock farming, 'horsification', land-use decision making, drivers, motivations, values, Vlaamse Ardennen, Belgium.

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1 Context & framing land-use change

The location of the Belgian case study is within the **Landscape Park Vlaamse Ardennen** (or short: Vlaamse Ardennen). The Landscape Park was recognized by the Flemish government in 2023 (Cordemans et al., 2025). The Park encompasses an area of 245 km^2 and is situated in the south of the Province of Oost Vlaanderen, close to the border with Wallonia (covering (parts of) Geraardsbergen, Horebeke, Kluisbergen, Maarkedal, Oudenaarde, Ronse, Zottegem, Zwalm (en Brakel)). The landscape is characterized by its rugged relief and a mixed, small-scale land use, with forests, arable fields and grasslands, interwoven with small landscape elements. The landscape is rich in natural and heritage values. There are numerous springs, charming villages, family-run farms, water mills and windmills. The area is popular for tourists and recreational users. The Vlaamse Ardennen Landscape Park was established to further strengthen the uniqueness of the landscape of the Vlaamse Ardennen and at the same time to respond to the challenges the region is facing (such as the disappearance of family-run farming, erosion, drought, loss of biodiversity, etc.) (Omgeving, 2023).

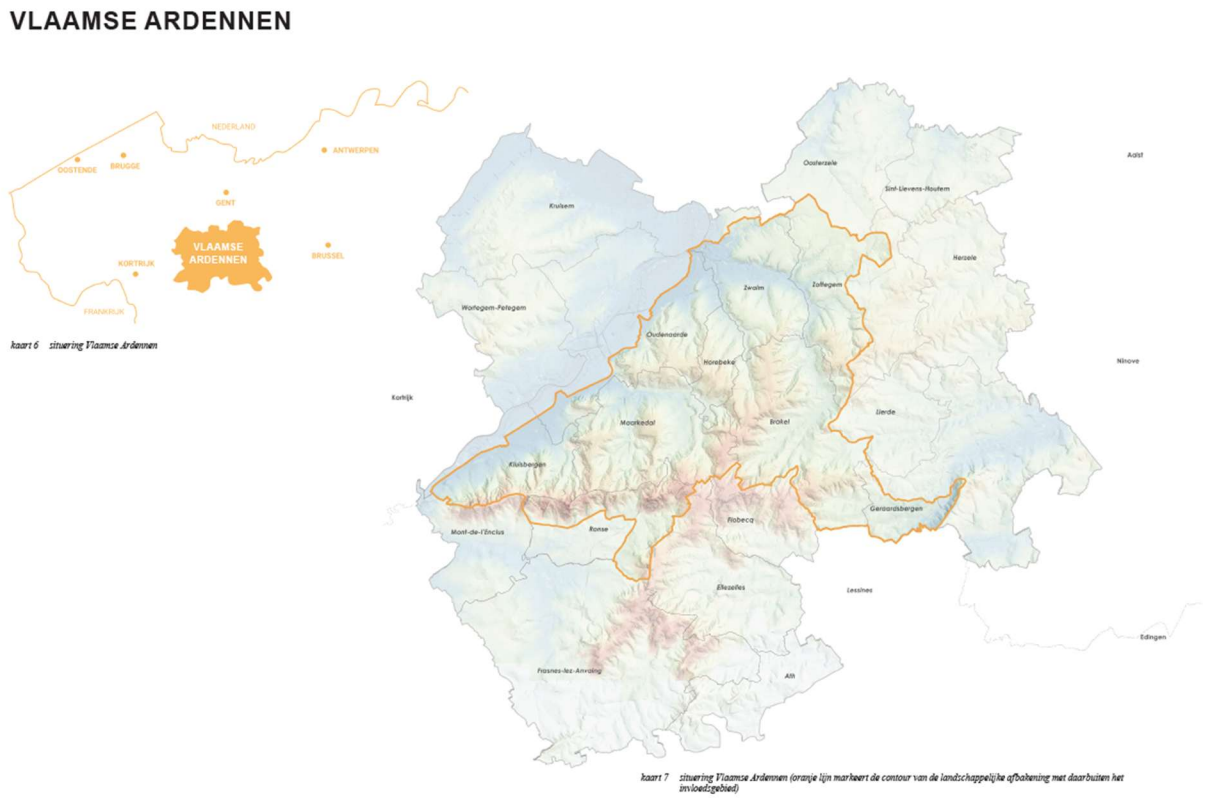


Figure 1: Location and boundary of the Landscape Park Vlaamse Ardennen (Regionaal Landschap Vlaamse Ardennen et al., 2023). This boundary is used for the further calculations, unless mentioned differently.

Agricultural grasslands are an essential part of the diversified 'bocage landscape' (= terrain of mixed woodland and pastures) in the Vlaamse Ardennen, and for the livestock farms that are operating in this landscape. However, these grasslands are under increasing **pressure**. As small-scale, diversified farms are often no longer profitable or face challenges to fulfil all the requirements, farmers have to choose between specializing or halting their farm activities. As a result, typical family livestock farming

is declining in the Vlaamse Ardennen, as in many places in Flanders, while the remaining family farms are becoming larger (Provincie Oost-Vlaanderen, 2025). This increase in scale of farms is leading to greater intensification and mechanization and changes in land use, including a decline of grasslands and an increase in arable farming.

This development is **caused** by many factors, such as fluctuating global market prices for milk, meat and arable crops, competition with other sources of animal fodder, and retirement without succession of livestock farmers. At the Flemish policy level, there are several government administrations that have policies affecting grassland management, such as those of Agriculture, Heritage and Environment (who also employ different definitions for grasslands). Stricter regulations (esp. related to manure management, Nitrogen (PAS)) is likely to put additional pressure on livestock farming, and there seems to be little coherence in the policy goals related to grasslands.

At the same time, new residents are moving to the region, attracted by the landscape and tranquillity. Some of them buy grassland from (retiring) farmers to let their animals (horses, llamas, etc.) graze or to use them as private gardens. Nature expansion, such as afforestation and restoration of biodiversity-rich grasslands, is also putting additional pressure on existing, agriculturally managed grasslands.

Considering this context, it is clear that there are many **actors that influence grasslands** and their use. For this research we focused on the farmers as the main grassland users. These are subdivided into five prototypical categories, based on a typology proposed by two farm experts (K. Sannen, K. Fauconnier) during explorative interviews (based on average data of Flanders, Sannen et al., 2024):

- Intensive dairy farms: On average 90 dairy cows (mostly Holstein breed) and an acreage of 60 ha. They focus on fodder production of grassland, maize and fodder beets.
- Mixed dairy-arable farms: On average 80 dairy cows and an acreage of 70 ha. Beside the specialised dairy breed, they also cultivate arable land, often with potatoes and grain.
- Mixed beef-arable farms: On average 30 suckler cows and an acreage of 65 ha. They cultivate grass, maize, potatoes, grain, sugar beets and vegetables.
- Combined dairy-beef farms with arable crops.
- Arable farms: An average acreage of 53 ha focussing on potatoes, sugar beets, grains and vegetables.

We mainly focused on the livestock farmers (first 4 types) because the (potential) changes of grasslands is more acute with this group of grassland users (esp. after retirement, loss of permit or when a farmer takes an additional job). All external and internal factors that influence the decision making of livestock farmers to maintain or convert grasslands, were considered.

In addition, the ‘new’ grassland users were also considered (the activities themselves are not per se ‘new’, but their increasing popularity is relatively new). There is a growing number of inhabitants who use grassland for ‘new’ activities, such as keeping/breeding horses, llamas, alpacas, sheep, goats, bison, deer, or use grasslands as large gardens (> 1 ha). They carry out these activities mostly as a hobby or a secondary source of income, some do so professionally. Their grassland area is often small, with most grasslands close to their home. Finally, there are also grasslands owned by nature organisations or by public entities. These groups are not the focus of this study.

Through better understanding the drivers of change in grassland management, this study aims to **support the objectives set by the Landscape Park** Vlaamse Ardennen, more specifically the aim to maintain grasslands for aesthetic landscape quality, infiltration, erosion control and biodiversity. Its Masterplan states that a strategy to maintain grasslands is to experiment with sustainable business models for grasslands (Regionaal Landschap Vlaamse Ardennen et al., 2023). The hope is also that by maintaining grasslands, there will be a higher tendency to maintain hedgerows (which have an important function for landscape quality and biodiversity connectivity for e.g. bats).

Our main **research question** is to identify the drivers and motivations for both **maintaining and managing grasslands by livestock farmers** and (to a lesser extent) **by 'new' grassland users**. To achieve a full understanding, we took into account the role of grasslands in the farming system, the trends of grasslands on their farms as well as the perceived trends in grassland acreage and management in the surroundings of these farms. We did this research in close collaboration with the Landscape Park Vlaamse Ardennen and VLM (Flemish Land Agency) to ensure that this report can contribute to their strategy for the Landscape Park. It is expected it will provide some clues to maintain grasslands and increase their quality in the park area, within a complex policy context, in collaboration with livestock farmers and 'new' grassland users.

In section 2 we explain the methodology used for this research, while section 3 gives a short overview of structural drivers for grassland use in Flanders (based on literature and spatial analysis). The main sections are 4 and 5, which explains the factors that influence decision making of livestock farmers and 'new' grassland users based on 23 in-depth interviews. Finally, in section 6 we summarise the results and reflect on their implications.

2 Methodology

For our data collection we relied on the following: a literature study focusing on grassland initiatives in Flanders and on the definitions of grasslands, an analysis of grassland trends and policies influencing grasslands, and interviews with local farmers and 'new' grassland users.

Firstly, we reached out to different experts on grasslands in Flanders. In total, we conducted six so-called **helicopter interviews**. The goal of these interviews was to get an insight on the different types of grasslands in the region, the different grassland users, the factors influencing grassland use and the trends of the overall grassland acreage. These interviews helped us get a better understanding of grassland dynamics in the Vlaamse Ardennen and were used to base our research strategy on.

Secondly, we started off by **delineating the research area**. Local experts recommended that we focus on an area with strong grassland dynamics in the Vlaamse Ardennen. Consequently, the catchment of the 'Peerdestokbeek' was selected. After exhausting the list of Peerdestokbeek farmers that use grasslands, we expanded our search area to neighbouring villages.

Thirdly, as this research aims to shed a light on perceptions of drivers and motivations of grassland land-users, we choose to employ qualitative research techniques, as they are more appropriate then for this purpose then quantitative research approaches. Based on the research needs of MOSAIC and the needs of the Landscape Park, we prepared an interview guide for **semi-structured in-depth interviews**.

To **select potential interviewees**, we relied on a list (provided by VLM) of farmers registered within the Vlaamse Ardennen perimeter. The list contained their acreage of temporary and permanent grassland (as indicated by the farmer on the yearly agricultural application) and the number of grasslands. This information is strictly confidential and was treated as such. We selected farmers who are active in the Peerdestokbeek catchment area and sorted them based on their total acreage of grasslands, their area of permanent and temporary grasslands and the number of grasslands. This way we combined recruiting farmers with many grasslands as well as farmers with large areas of grassland. This resulted in a pre-selection of 29 farmers. The interviewees were randomly selected from our priority list, and about 50% of the contacted farmers agreed to participate. We stopped looking for new interviewees when a representative variation of the different farm-types (explained above) and saturation in the results was found. Finally, we interviewed six dairy-arable farms, four beef-arable farms, three dairy-beef farms, one intensive dairy farm, and one arable farm. Most interviewed farmers were male. In some cases, the farmer's wife joined the conversation or hung around; in one case the wife led the conversation while the farmer was at work outside.

From April to October 2025, we contacted the farmers by telephone and **conducted interviews** with 15 farmers at their farmstead. Each interview was scheduled to last about 1 to 1,5 h and each farmer was given a compensation of 100€ for their time. The interviews themselves were conducted on their own farm by one or two researchers, and if allowed recorded to facilitate transcription. Each interviewee voluntarily signed a GDPR agreement that their information can be stored and used during the duration of the project.

Next, we transcribed all the interviews. Based on the research question and on our interview experience, we abductively (= combination of induction and deduction) composed a **codebook** (this is

a list of recurring themes and topics mentioned during the interviews). This was inserted in Dedoose, a software for qualitative and mixed-methods data, in which the interviews were coded. These excerpts are the empirical material on which we base our perception research conclusions.

In a parallel trajectory the **photovoice method** was conducted to gather information about how farmers perceive and value grasslands in the Vlaamse Ardennen. In collaboration with the Landscape Park's coordinator, we reached out to farmers. They were invited to take pictures which illustrate their relationship with grasslands. After four weeks we met up with 5 farmers and collectively analysed their pictures and discussed the insights. The results can be found here: Booklet Belgium.

For the research on **'new' grassland users**, relevant persons were identified via online search engines, social media, and during our search for livestock farmers. Suitable candidates were contacted and asked whether they were willing to be interviewed. In total 7 'new' grassland users were interviewed via semi-structured interviews. Due to the high variation of 'new' grassland user types, no complete saturation of the results was found. This means that we need to be careful with generalisation of the results. A simplified thematic analysis was performed based on audio recordings of the interviews. Respondents' answers were organized by theme according to a pre-established list of (sub)themes.

The main results of the research were discussed and validated during the **Policy Lab meetings** on 30 September 2025, 19 November 2025 and 21 January 2026.

3 Structural external drivers for grassland change in Vlaamse Ardennen

In this chapter, we briefly describe the structural external drivers that operate externally from the land-user (livestock farmers and 'new' grassland users), based on literature and interviews with experts, and that can influence the conditions in which the land-users operate, and hence can impact land-use changes and management of grasslands.

3.1 Trends in farming and grasslands in Vlaamse Ardennen

In the **Province of Oost-Vlaanderen**, the **number of farms** has fallen by 41% over a period of 20 years (2003-2023). At the same time, the average area of an agricultural holding rose from 23ha in 2013 to 26 ha in 2023 (in Flanders from 25 ha in 2013 to 28 ha in 2023) (Provincie Oost-Vlaanderen, 2025). The proportion of **female farm managers** (2023-2024 data) in Flanders is slowly increasing but is still very low among dairy and beef cattle farms (12%) in comparison to the overall European average of 31% (Eurostat, 'ef_m_farmang' 2020; Brouns, 2025).

The **cattle population** in **Flanders** has declined since 2005. In 2024, the Flemish Region counted 1.18 million cattle. Over the entire period from 2005 to 2024, the dairy cattle population has grown by 11%, while the suckler cow population has decreased by 36% (Statistiek Vlaanderen, 2025). In the 9 municipalities and cities which are related to LVA, the total cattle population had declined with 9% during the period 2019-2024 (37.958 to 34.609). However, the average amount of livestock units per farm has been steadily increasing up to 205 livestock units per farm (a 31% increase between 2014 and 2024, Statbel). For the region of the Vlaamse Ardennen, the average is significantly less (e.g. the municipality of Zwalm has on average between 50 and 75 livestock units per farm).

In 2022, agricultural use covers 62% of the total land of the Vlaamse Ardennen (VA), which is substantially higher than the Flemish average of 49%. **Grasslands cover** 36% of this VA agricultural land, while the other 64% is used as cropland. Most of the grasslands in agricultural use in the Vlaamse Ardennen can be categorised as 'permanent grasslands' (83% of grasslands in agricultural use) according to the definition that is in place since the reformed Common Agricultural Policy (CAP) of 2015.

The area reported in agricultural use in these figures is based on the annual declaration to the Flemish Agricultural Agency. In this Annual Declaration, all agricultural land-use parcels must be registered, as well as certain non-agricultural areas (such as stables and buildings, non-agricultural land that is grazed, and groups of trees), that are used by farmers that either apply for support under the CAP or are required to declare parcels to the Manure Bank. This is required for anyone who uses more than 2 ha of agricultural land or produces more than 300 kg of P_2O_5 from animal manure, which corresponds to more or less 15 horses. This means that a large share of the so-called 'new' grassland users do not fall under this category of agricultural land. To date, there is no comprehensive overview of the extent of land owned and managed by these so-called 'new' grassland users. Part of the land owned and used by these 'new' grassland users is thus recorded as agricultural land (when subject to manure bank reporting obligations), while another part is classified as 'grasslands in gardens' (for those parcels on which a residential use has been recorded) or 'other grasslands (with or without ecological value)' (Fig. 2). The latter is a broad category that also includes other types of grasslands without any agricultural

use, such as road verges, abandoned land, construction land, etc. To date, the necessary spatial data to further subdivide the category 'other grasslands' according to their use are lacking.

The share of grasslands in (the aforementioned strict definition of) agricultural use is substantially higher in the Vlaamse Ardennen (63%) compared to other regions in Flanders (56%). On the other hand, the proportion of grasslands that are managed as nature conservation land is comparatively low (only 1,2% of the total grassland area in the Vlaamse Ardennen vs. 3,4% on average in Flanders) (Fig. 2).

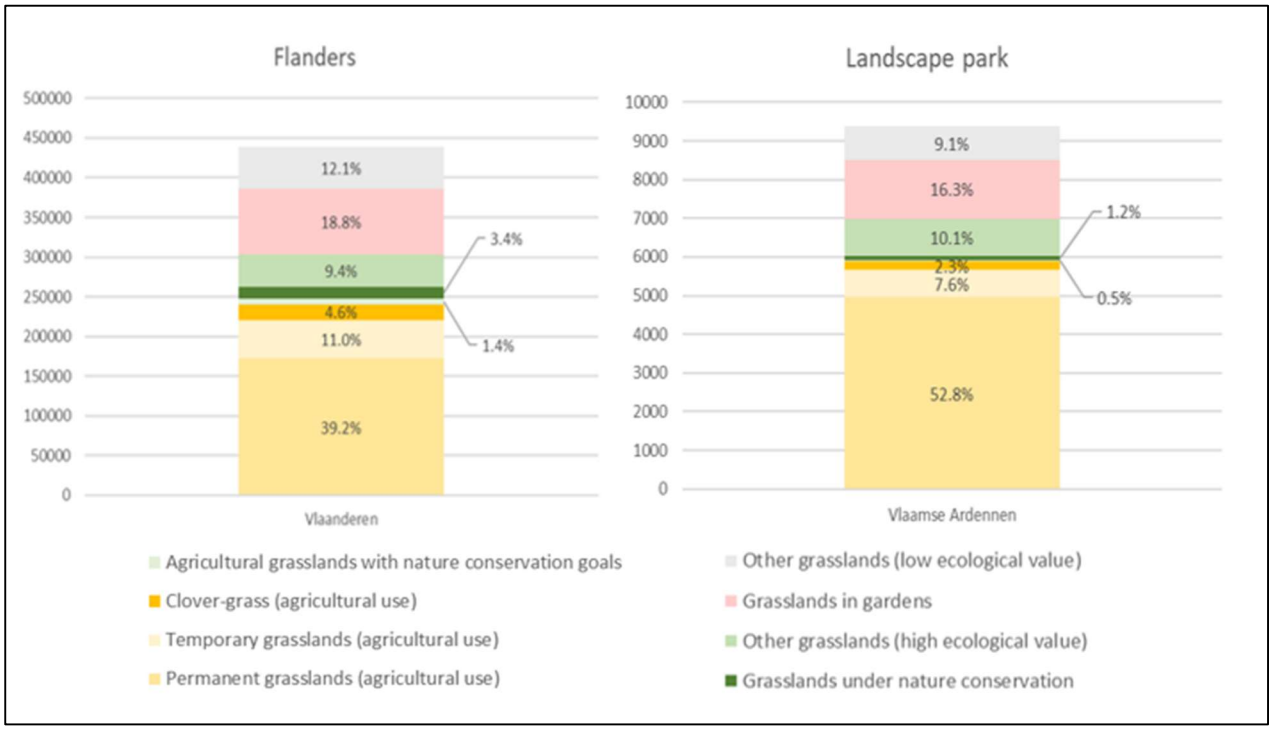


Figure 2: Area (in hectares) and share of different types of grasslands in Landscape Park Vlaamse Ardennen (right) versus Vlaanderen region (left).

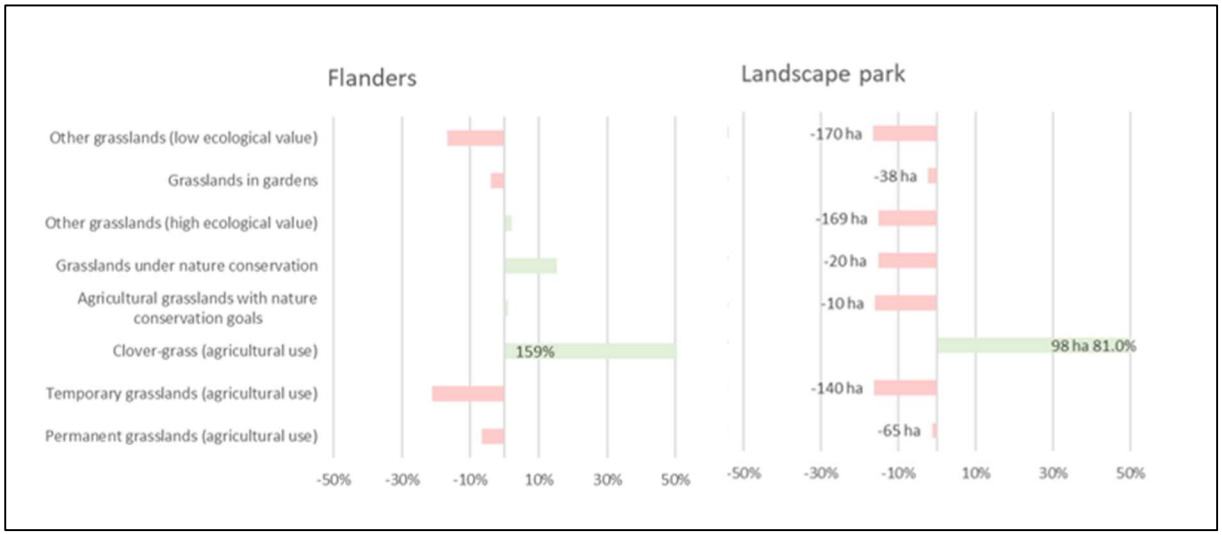


Figure 3: Relative evolution of grassland types in Flanders region (left) and the Landscape Park Vlaamse Ardennen (right) during 2013-2022 (green: area increase, red: area decrease).

Analysis of **grassland dynamics over a 10 year period** between 2013 and 2022 (Fig. 3) indicates that the landscape Park **Vlaamse Ardennen** experienced a net decline in the total grassland area (-5,2%, 513ha), which is similar to the average decline in Flanders (-5,3%):

- In contrast to the rest of Flanders, this grassland decline affected nearly all grassland categories, with the exception of **clover-grass mixtures**, which are mixed pastures composed of grasses and clover species with high nutritional value (Fig. 3) The total share of these clover-grass mixtures in the total grassland area remains however relatively small (Fig. 2).
- While in the rest of Flanders **grasslands with nature value** (grasslands under nature management, grasslands in agricultural use but with nature objectives or grasslands with an unknown use, but with high ecological values) are still showing a slight increase, the area of these types of grasslands is also declining in the Vlaamse Ardennen (Fig. 3). Part of this decline can be explained by afforestation. Some of this afforestation takes place within the Natura 2000 site 'BE2300007' ('Forests of the Vlaamse Ardennen and other South Flemish forests') where the long-term habitat goals explicitly include creating stronger forest habitat networks (e.g. realizing larger forest cores and better connections between them). Further analysis of spatial datasets is needed to determine the role afforestation plays in the disappearance of grasslands in the Vlaamse Ardennen and whether this is limited to Natura 2000 areas.
- The relatively small reduction in **permanent grasslands** compared to the rest of Flanders is particularly noteworthy (-1% in Vlaamse Ardennen vs. -7% in Flanders, Fig. 3). A key challenge addressed in the Landscape Park's master plan, and the central research question of this report, concerns the pressure on grasslands in the Vlaamse Ardennen, where permanent grasslands under agricultural use make up the largest share. For this reason, we take a closer look at the dynamics affecting permanent grasslands. Figure 4 (top) shows the dynamics in permanent grasslands in the Vlaamse Ardennen in the period 2013-2022. More than 80% of the total area of permanent grasslands in agricultural use have not changed during this period. 300 ha (6%) have shifted from permanent grassland to cropland, another 290 ha (5,8%) to other (non-agricultural) land uses. The latter includes the shift from grasslands in agricultural use to 'new' grassland users. The disappearing permanent grasslands are partly offset by new permanent grasslands (+730 ha), which keeps the overall decline in the area of permanent grassland relatively limited to –1%. These new permanent grasslands mainly result from the conversion of grasslands that were classified as 'temporary grassland' in 2013 (+341 ha). This conversion of temporary to permanent grasslands is largely explained by a change in the way permanent grasslands have been registered and monitored since 2015. Following the reform of the Common Agricultural Policy (CAP) in 2015, all grassland parcels that have been in place for five consecutive years automatically acquire the status of "permanent grassland" after the fifth year. At the Flemish level, this has led to a substantial shift in the statistics: a large share of parcels that were previously registered as temporary grassland have since been reclassified as permanent grassland. The observed growth in permanent grassland is therefore mainly the result of a change in registration rules and is therefore not really visible in the landscape (existing temporary grassland is reclassified as permanent grassland, but the grass cover on the ground remains the same). If we assume that the conversion of temporary grassland to permanent grassland is mainly the result of changes in registration procedures, the decrease in permanent grassland would amount to 7,5% (-406 ha).

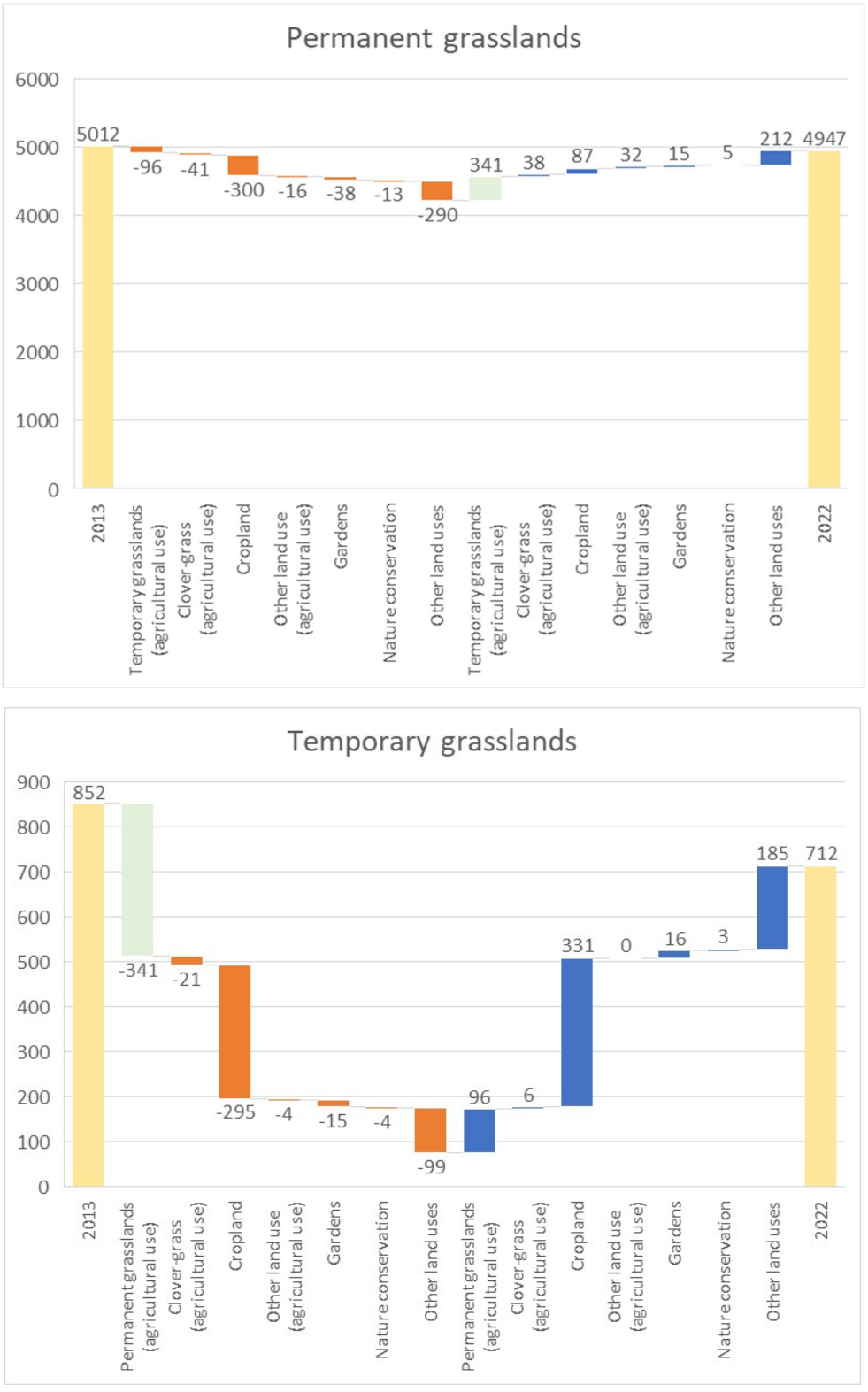


Figure 4: Changes in permanent (top) and temporary (bottom) grassland in Vlaamse Ardennen between 2013 and 2022 (orange = area decrease, blue = area increase, green = administrative reclassification).

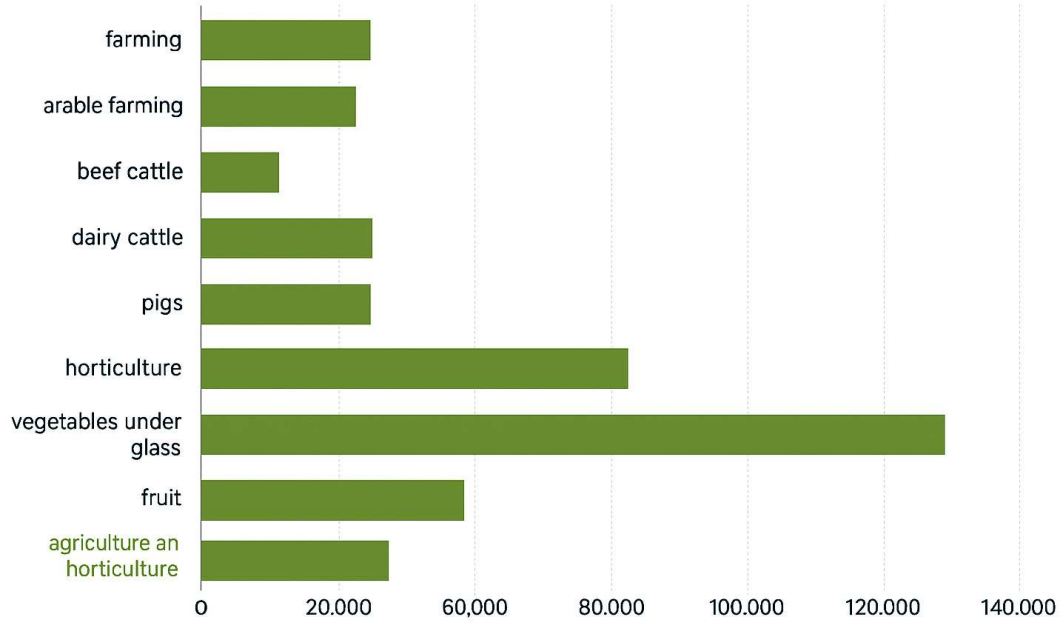
- Figure 4 (bottom) shows a similar representation of the dynamics in **temporary grasslands** in the Vlaamse Ardennen in the period 2013-2022. Since temporary grasslands are part of the crop rotation, their behaviour is more flexible. More than 90% of the temporary grasslands present in the Vlaamse Ardennen in 2013 were converted to another land use. A total of 341 ha was "administratively converted" to permanent grassland (see above). During this period, 295 ha of temporary grasslands were converted to another agricultural crop, while 331 ha of arable land had been converted to temporary grassland. As a result, temporary grasslands in LVA 'reduced' with 16% (-140 ha, Fig. 3).

The combination of factors (intensive agricultural utilisation, limited nature-managed grassland, and an area decline) suggests mounting pressures on the region's grassland ecosystems and highlights their increasing vulnerability within the broader landscape context. The figures, however, indicate that this pressure does not differ greatly from the rest of Flanders, where grasslands are also under considerable pressure. In the Landscape Park, this decline warrants particular attention due to the important role grasslands play in shaping the landscape and supporting associated recreational activities, as well as their function in erosion control and water retention in this highly hilly agricultural area, and their contribution to biodiversity (e.g. through conservation targets for the bocage landscape within the Natura 2000 site).

3.2 Economic & market driver

As farming is primarily an economic activity, an array of factors related to the economic system (such as resource availability, production and consumption patterns and market prices) have a profound impact on the livestock farming systems, and consequently on the grasslands used for livestock. In this section, we aim to briefly enumerate the most important elements that make up the business model of a livestock farm, and some of the most relevant trends.

The average household income - what is left of the income after subtracting all the costs - is different for every agrarian sector (Fig. 5). The household income per labour force is by far the lowest for beef production. The household income for dairy farming is average compared to other agricultural activities in Flanders.



Bron: Agentschap Landbouw en Zeevisserij op basis van LMN

Figure 5: Annual household income per unit family labour (in euro, average for 2017-2021).

The farm business model consists of **costs** and **income**.

Costs

The costs of a livestock farm can be subdivided into variable costs, namely elements that need to be purchased every year, and fixed costs. The **variable costs** include seeds, fertilizer, pesticides, herbicides, fuel, fodder and labour costs. In Flanders, in absolute terms, mainly nitrogen **fertilizer** is used on grassland (47%) and cereal crops (19%) in 2021 (Agentschap van Landbouw en Zeevisserij, 2024). There is a decline in the proportion of family **labour** in relation to non-family labour. In Flanders, the non-family labour of the total labour force on a dairy farm grew on average from 4,3 % in 2003 to 21,5 % in 2023. This has implications for the labour costs.

The **fixed costs** comprise land and larger investments, such as machinery and buildings (e.g. stables). Over a ten year period (2013-2023), the average **price for a hectare of agricultural land** in Flanders has increased by almost 69%. In 2023 the average price was €66.288/ha. In the same period, the lease price has increased by 45%. In 2022, the Flemish average was 424 euros/ha, which is also the average for the Province of Oost Vlaanderen. A hectare of arable land can be 50 % more expensive than a hectare of grassland, which can incentivize farmers to plough up grassland to increase the value. High land prices can also influence farmers to choose for the most lucrative arable crops.

Revenue

The **income** depends on the prices for farming products and on income support and/or compensation. The farm-gate **prices** determine to a certain degree production a farmer will focus on. The index price for milk and for beef has steadily increased since 2010, with a peak for milk in 2022. For potatoes, the index price has more than doubled since 2010. This explains why potatoes have risen to become the

most important arable crop in Flanders and make up to 47% of the total production value of arable farming. Worldwide, Belgium is the largest exporter of frozen potato products and frozen vegetables (Agentschap Landbouw en Zeevisserij, 2024). The second and third main arable crops are cereals and sugar beets. However, the index price for potatoes has dropped by 32% between 2024 and 2025 (Statbel, 2025), showing that prices are very volatile, dependent on a changing world market.

Direct financial support from CAP funds makes up an important part of the farm income, though the proportion depends on the farm type. On average for the period 2017 till 2021, beef farms depend for almost 56% of the farm income on direct income support, while this is only 15% of a dairy farm (Agentschap Landbouw en Zeevisserij, 2024). In addition, **market-initiated certifications**, such as the label "pasture milk" or 'organic milk', can (potentially) provide financial bonuses to farmers.

3.3 Government policy & regulation influencing grassland use

In terms of policy, the most important factors influencing the decision to maintain, ploughing or reseeding grassland are linked to the implementation of European regulations, such as the Flemish interpretation of the conditionalities of the European Common Agricultural Policy (CAP) and agri-environmental climate measures or eco-schemes. Based on expert knowledge and desktop research following policies are regarded as influencing grassland in Flanders:

Policies related to maintenance of grassland:

1. Within the Flemish agricultural policy, there is an **obligation to maintain grassland** and other grass mixtures that have not been in crop rotation for more than four years (GAEC1 of the CAP). However, this means that grassland and alike is often converted to arable farming every few years, in order to prevent it from becoming permanent grassland. This can be interpreted as a (probably unnecessary) avoidance strategy, as farmers can only be obliged to reseed if the 2008 grassland area of the reference area (in this case Flanders region) decreases by more than 3%. According to a parliamentary question (12/12/2022) there was a decrease in reference area of 3,14% in 2022, but no information can be found if some farmers were really obligated to reseed their grassland.
2. Grassland located within the **Natura 2000 network**, the Flemish Ecological Network (VEN) or ecologically vulnerable agricultural areas, may not be ploughed up. Restrictions are also imposed on the use of pesticides and fertilisers, although exceptions are made for residential plots. Municipal, provincial or regional spatial implementation plans may also impose additional conditions regarding the preservation of grassland.
3. The preservation of grassland may be legally mandatory because of for instance the **Heritage** Decree (protected Cultural-Historical Landscape), the **Nature Decree** (for historical permanent grassland or ecologically vulnerable permanent grassland), or as part of a **nature management plan**. In such cases, an exemption or permit for vegetation change is required.
4. **Flemish spatial planning policy** provides spatial implementation plans (regional, provincial or municipal) that may contain regulations for the preservation of grassland, such as a ban on ploughing grassland in agricultural areas of ecological importance.

Note: In Flanders, much of the natural environment is located on land designated for agriculture, and conversely, much of the agricultural land is located in green destinations. Of the registered agricultural area, 11% is not located in an agricultural area: 6.5% is categorised as green (forest, nature reserves and other green areas), 4.2% is categorised as hard (residential, industrial and other), and 0.3% is designated for recreation (link).

Policies related to management of grassland:

5. The **Manure Decree** can also indirectly influence the decision to opt for grassland, as fertilisation standards for grassland are generally higher, and the spreading dates are somewhat more flexible than for most arable crops.
6. The **Nitrogen Decree** may also have an indirect impact on the amount of grassland, as it may result in a reduction in livestock numbers, leading to lower requirement of grasslands.
7. The plot's **susceptibility to erosion** can influence whether or not a plot of grass can be converted to arable land and still comply within the CAP's conditionalities. The obligation to provide erosion strips on steep slopes (as stipulated in the conditionalities of the Flemish agricultural policy and the Decision of the Flemish Government on erosion control) can also influence the choice of crop on the adjacent plots and likely more grassland will be cultivated.
8. To improve **water quality protection strips** along watercourses are mandatory according to the Manure Decree. Buffer strips may vary from 3 to 5 m depending on location, water quality (surface and ground water) in the direct area, and the type of crop (depending on N-loss susceptibility of crop). The use of pesticides and fertilisers in this protection strip ('beschermingsstrook') is prohibited, and only limited soil manipulation is allowed. This will also influence the choice of crop on adjacent plots and likely more grassland will be cultivated since grazing is permitted up to the edge of the watercourse.
9. The Flemish government is encouraging grassland preservation by offering **agri-environment-climate measures and eco-schemes** (link) that compensate farmers for maintaining or developing grassland. In 2024, AECM (botanical grassland) uptake is rather limited (27 ha), while eco-scheme payment were made for 2338 ha permanent grassland (about 50% of registered permanent grassland) (link, incl. 193 ha ecological managed grassland). Also, a support scheme for suckler cows was introduced in 2023. This support is subject to conditions related to sustainable grassland management.

Policies related to conversion to other land-uses:

10. Flanders also actively promotes the **conversion of agricultural land to forest or nature** through subsidies to private individuals and nature organisations.
11. Flemish policy allows for many possibilities for the use of agricultural land that does not align with the designated zoning through a **non-zoning change of function** of farms and surrounding residential plots (Verhoeve and Vanempten, 2026). If this has already been realised without a permit, it can often be regularised retrospectively.

3.4 Urban sprawl and demographic changes in the Vlaamse Ardennen

For a long period, the spatial planning policy (or the lack of it) in **Flanders** enabled urban sprawl, whereby built-up areas have expanded diffusely into peri-urban and rural landscapes (in-situ urbanisation), rather than centrifugally around existing urban cores (Buitelaar & Leinfelder, 2020; Vermeiren et al., 2022; Leinfelder & Buitelaar, 2020). In a region already characterised as one of the most densely populated and spatially fragmented areas in Europe, this dispersed urban development has exerted and still exerts substantial pressure on open spaces. As a cascade system, urban development replaces intensive land-based agriculture land and consequently affects extensive agriculture and nature. This results in both a progressive loss and increased fragmentation of grasslands (Alberti, 2005; Declerck et al., 2017).

The **Vlaamse Ardennen** exhibits a somewhat lower rate of demographic growth in comparison with the broader Flemish region. Between 1985 and 2025, the population of the nine municipalities within the Landscape Park increased by 15% (22% in Flanders). This growth is mainly driven by immigration from other Belgian municipalities, while the natural population growth is negative (Fig. 6).

Despite this relatively modest demographic expansion, the area is characterised by a higher intensity of urban sprawl. Residents of the Landscape Park are proportionally more likely to reside in **dispersed settlement patterns** or **ribbon developments** (42%) compared to the Flemish average (27%, Pisman et al., 2021). In addition, the residential footprint in the region is markedly larger. Approximately 69% of households live in single-family dwellings (64% in Flanders), with a substantial share of these comprising detached housing typologies (42%), with relatively large gardens (Source: provincies.in.cijfers). These patterns highlight the paradox whereby limited population growth is accompanied by disproportionately land-intensive settlement structures, contributing to spatial fragmentation and increased pressure on open space and grasslands in particular.

Another potential contributing factor is the **reuse of vacant farmsteads** into residential housing by private citizens (Verhoeve et al., 2018) when agricultural businesses close. In the Province Oost-Vlaanderen 39% of them are being converted into rural residences, with the surrounding farmland often being used as a garden or pasture for hobby animals. These developments are changing the use of agricultural land and causing a shift in the use of grasslands.

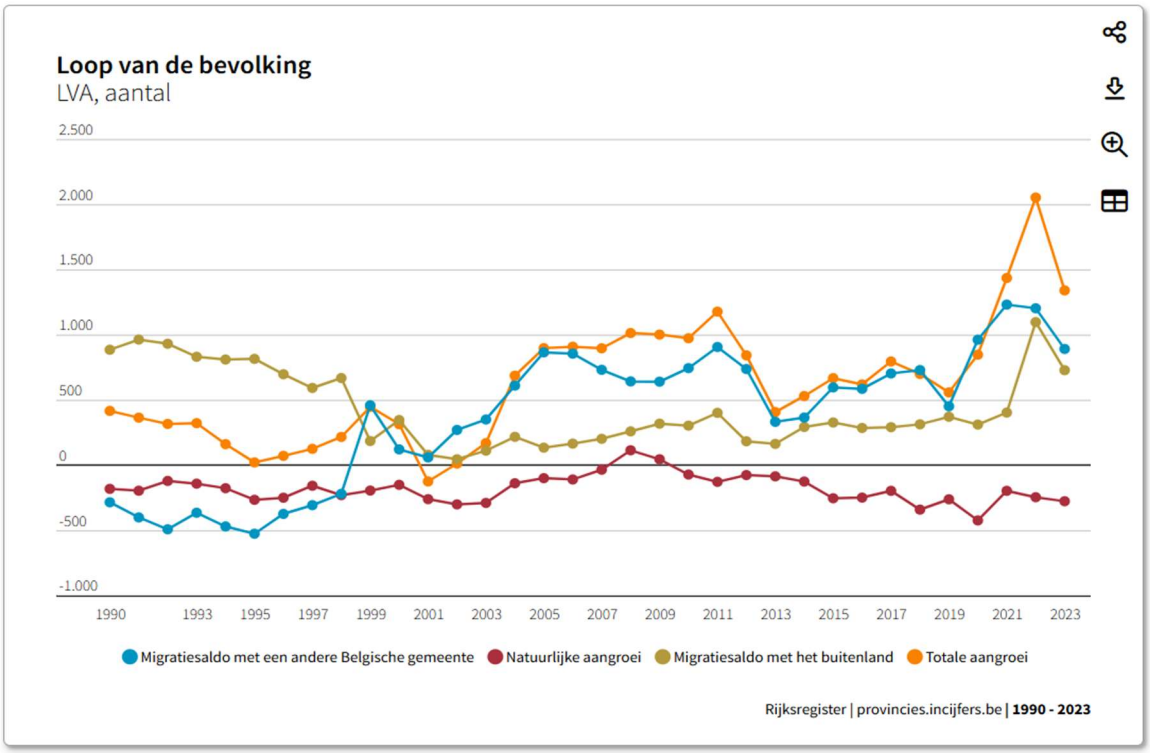


Figure 6: Evolution of population in the municipalities linked to the landscape park during the period 1990-2023, distinguishing natural growth and migration flow.

3.5 Role of climate change

There are two key climate change trends impacting grassland production and livestock raising: increasingly wet winters and dry summer spells resulting in a cumulative precipitation deficit, and increased frequency of heatwaves.

The **precipitation deficit** is the difference between precipitation and the potential evapotranspiration. This difference is determined on a daily basis. However, as stress in plants due to low water availability only occurs over longer periods, the precipitation deficit is viewed cumulatively throughout the entire growing season from April to September. Since the 1980s, there has been a clear increase in precipitation deficit in Flanders. The average precipitation deficit in the period 2016-2025 was exceptionally high and rose to almost 200 mm (which never occurred in the period 1906-2015) (Fig. 7). Increasingly warm summers and wet winters are also expected climate change impacts and already have an impact on farm activities. Figure 8 shows the increasing potential for wetter winters and drying summers. According to this model, the Vlaamse Ardennen are expected to face a 20 to 25% increase in rainfall during winters and a shortage of rainfall of up to 5%.

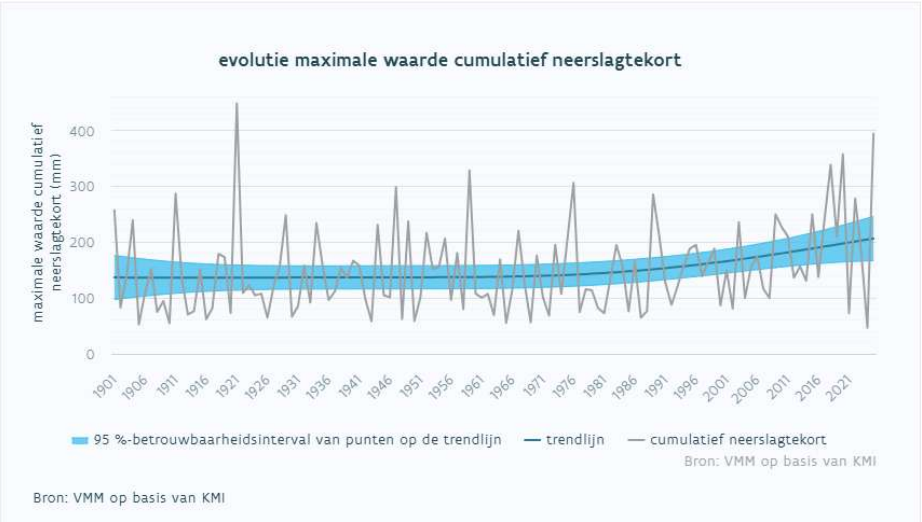


Figure 7: Evolution of maximum value of cumulative precipitation shortage in Flanders (source: VMM website).

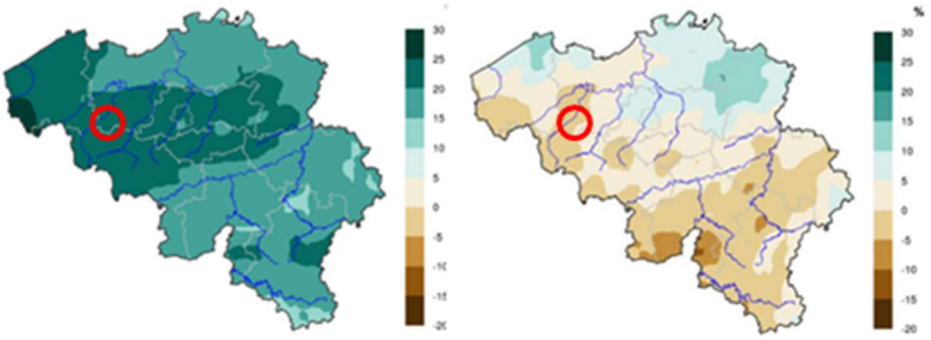


Figure 8: Predicted rainfall in winter and summer in Belgium for the year 2085 in comparison (%) to the reference years 1976 to 2005. The Vlaamse Ardennen area is indicated with the red circle (Source: Serga Zaka, based on KMI ALARD model).

As a result of these trends, climate change in 2070 to 2099 is expected to affect grassland dynamics in several ways. We highlight two expected impacts on grasslands that will likely have an impact on how grassland users will manage their activities (Fig. 9).

- **An increasingly longer growth season for grass with more variation in growth:** The grass production season is projected to lengthen, starting earlier and ending later. Yet grass production will be more irregular and subject to weather impacts (3) (e.g. very wet periods and dry spells). Peak production is expected in spring due to optimal conditions (1), followed by a decline in summer because of heatwaves (2). A smaller production peak is anticipated in autumn. To cope with climate change, adapting grassland management will be crucial. Several strategies are proposed to address these changes: leveraging genetic diversity to maximize the spring growth peak, introducing specific seed mixes to mitigate the impact of summer heatwaves, enhancing the stocking of spring harvests in both quality and quantity to offset summer growth losses, and supplementing with additional feed sources such as hedges or feed crop mixes.

- **An increase in heat stress days for cattle:** Another change expected from climate change is the increase in heat stress days for cattle, especially for dairy. In its codex for animal welfare, the Flemish government already foresees mandatory provision of shade for cattle by 2029. Figure 9 shows the predicted milk production loss (%) for the years 2070 to 2100. For the Vlaamse Ardennen this loss could amount to 10 to 12,5%, according to a strong RCP8.5 scenario. This loss may have an impact on the profitability of grass-based dairy operations if no appropriate mitigation strategies can be found. On the other hand, it is difficult to estimate how the productivity of competing crops will affect the use of grasslands. A lower crop productivity may result in an overall productivity loss without much land-use change. Another possible consequence of milk production loss is the increased use of adapted stables with air cooling through fans or water vapor (or both), which may drive farmers to reducing grazing practices.

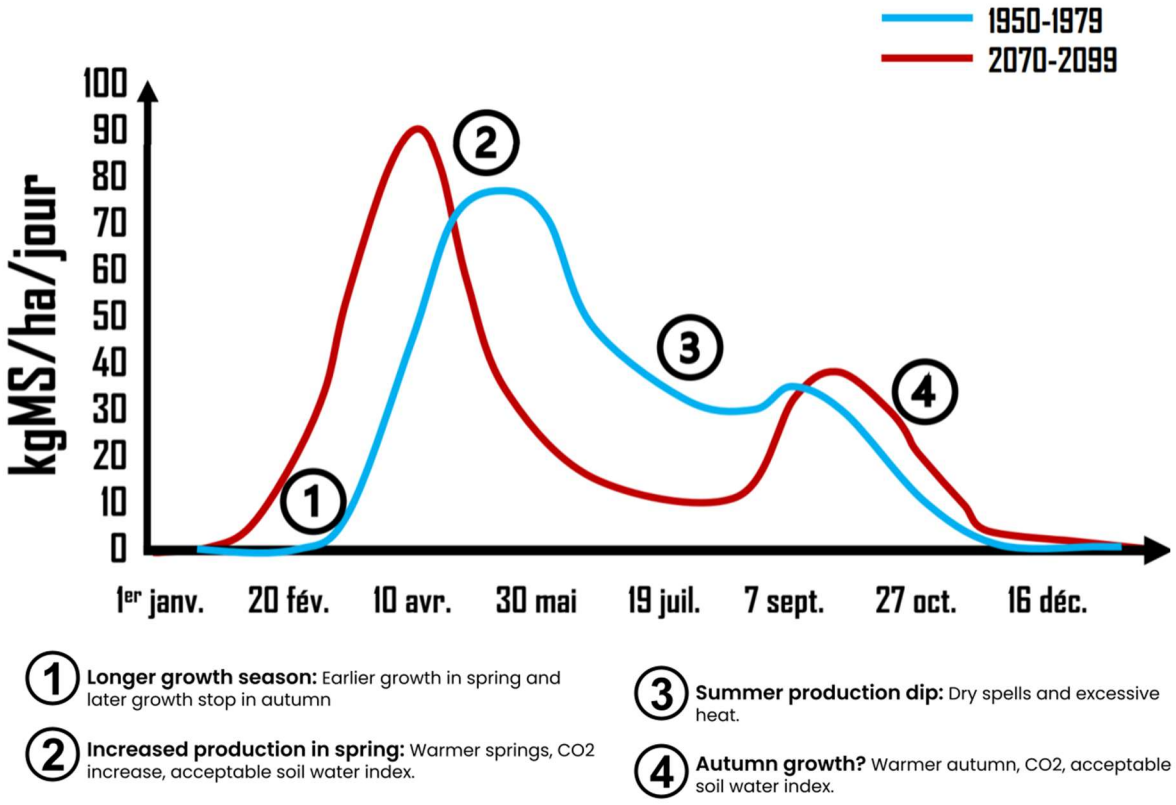


Figure 9: Expected changes in grassland dry matter (kgMS) production up to the year 2100. (adapted from Serge Zaka,CLIMALAIT de L'IDELE).

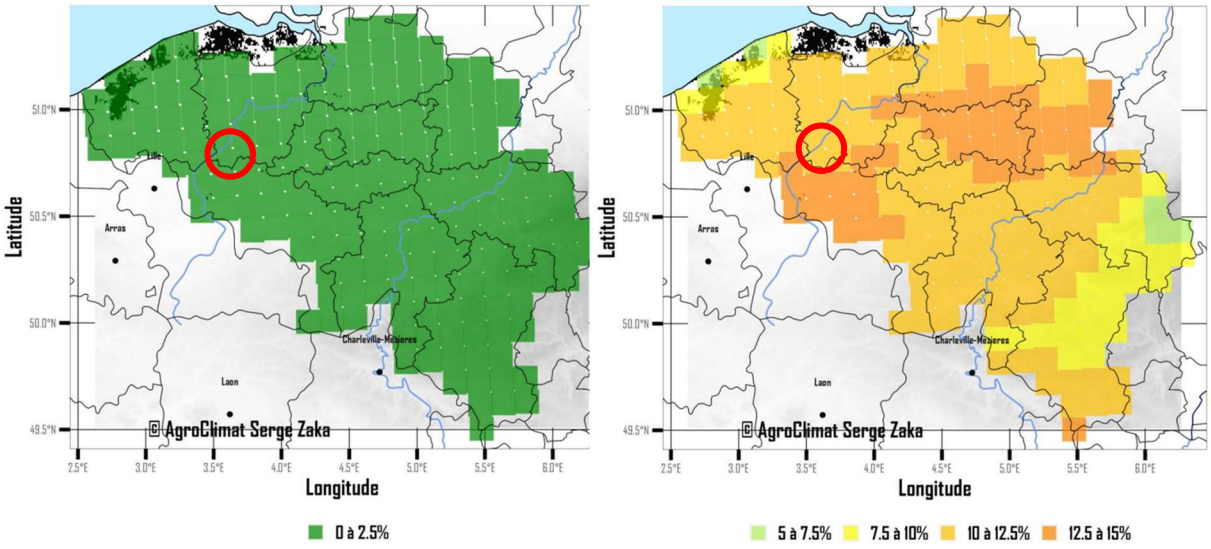


Figure 10: (%) Predicted milk production loss in comparison to reference years 1970 to 2000, based on a strong RCP8.5 scenario and a strong confidence indication. The Vlaamse Ardennen area is indicated with the red circle (Source: Serge Zaka - AgroClimat).

4 Factors influencing grassland decision making of livestock farmers

In this chapter we analyse the farmers' perception on the decision making of livestock farmers regarding their grasslands and their impacts in Landscape parc Vlaamse Ardennen (LVA). This section is based on the 15 interviews, and the results are summarised in the mind map (Fig. 11).

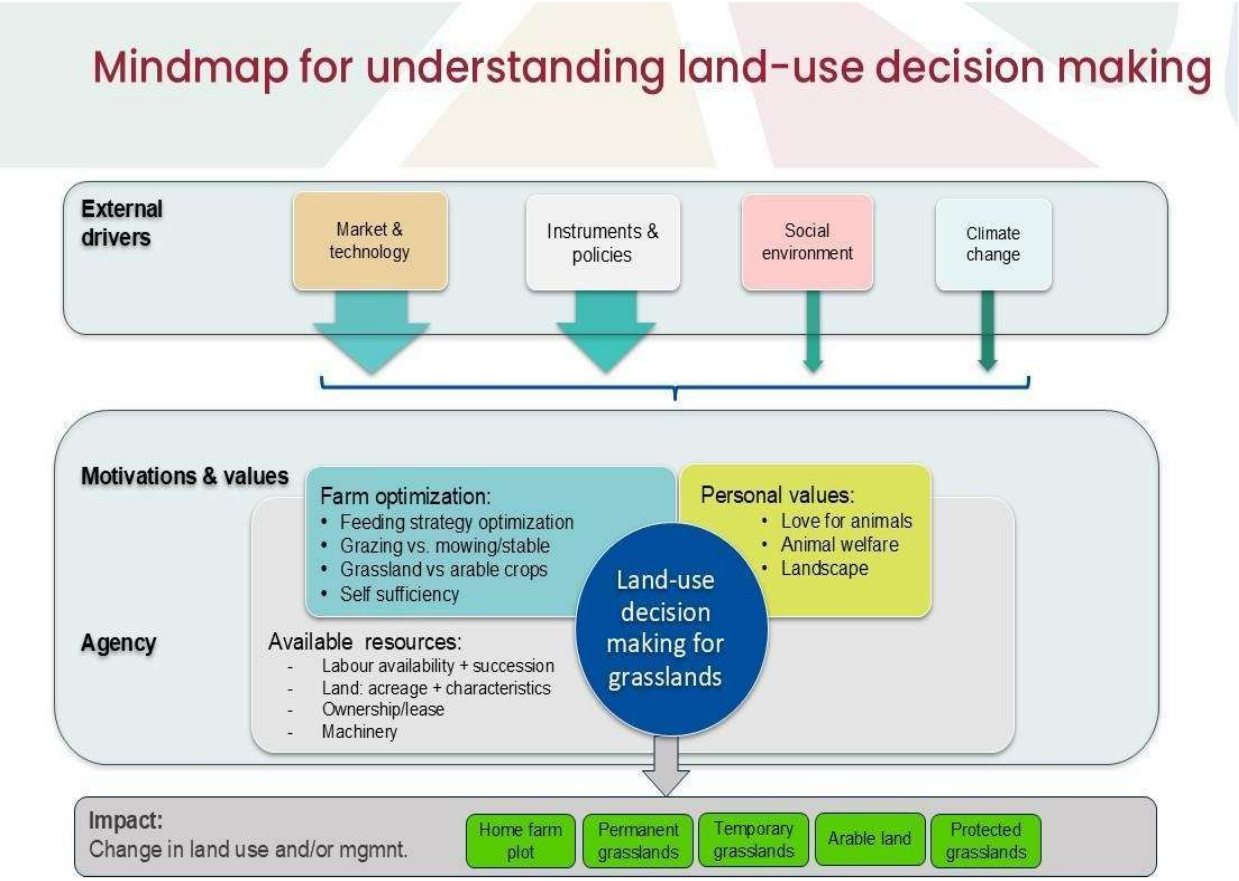


Figure 11: Mindmap of the factors influencing maintenance or changes in grassland use and management by the 15 interviewed farmers in LVA.

4.1 Role of grasslands in the farming system

4.1.1 Farm typology of interviewed farmers

The 15 interviewed farmers with grasslands can be subdivided into five categories (as explained in the section 'Context'):

- The most encountered category (6/15 respondents) are the '**mixed dairy-arable farms**'. Generally, they receive most of their income from dairy farming, but all grow potatoes and sometimes other arable crops that are not used for fodder, such as onions, sugar beets, cabbage. For most of the farmers, potatoes generate a welcome supplementary income, while milk production remains the main source of income (although this varies from year to year).

For one farmer growing vegetables generates the main income. The proportions of land-use differ. Their acreage ranges between 48-180 hectares, and one sixth to almost half of the farmers' land is grassland. One farmer has almost a similar area for potatoes as for grasslands, the others have much less. Holstein is the most common cattle breed. Two of the farmers mentioned they used to have dairy and beef livestock, but have decided to specialize in dairy as it generates a more stable income.

- The second most encountered category are the '**mixed beef-arable farms**' (4 respondents). They have a smaller acreage (7 - 80 ha), of which a third to a fourth is grassland. They all have 'Belgian Blue' cattle. Two of these farmers in this category are of retirement age.
- The third category are the '**combined dairy and beef farmers with arable crops**' (3 respondents). They use between 100 and 170 hectares, of which 30% to 40 % is grassland. One of them has a dual-purpose cattle breed, the others have 'Belgian Blue' and Holstein cows.

For two categories we encountered only one respondent:

- The '**intensive dairy farmer**' has a business similar to the mixed dairy-arable farms. However, the acreage is smaller, with about 55 ha of which three fourth is grassland. It is important to note that this was the only respondent that does not grow potatoes.
- The '**arable farmer with grassland** kept some of his grassland after transforming his livestock farm to an arable farm. Unsurprisingly, this farmer had the smallest proportion of grassland, namely only 2,5 ha of his 100 ha of land.

4.1.2 Grassland typology of interviewed farmers

Farmers differentiate their grasslands in a similar fashion. On the one hand, farmers make some obvious distinctions between their grasslands. For example, some farmers indicate that they just distinguish grasslands that can be **mown and those that cannot**, depending on parcel characteristics (wet or dry, flat or inclined, presence of stones..).

Farmers also mention that they make distinction between their **temporary and permanent grasslands**. Permanent grasslands are meadows or pastures, while the temporary grasslands are rotated with arable crops. Some farmers point out that often the soil quality of permanent grasslands is inferior to the soil quality of arable land.

"If a conversion takes place, it will be grasslands with high quality-soil."

On the other hand, farmers mention several factors that influence the use and management of grasslands. The most common factors are the **biophysical properties of the grassland**. Poor soil quality, stony or steep slopes prevent permanent grassland from being converted to arable land. Also plots that are too wet cannot be worked, or only later in the season.

In addition, farmers put strong emphasis on the **location of the grasslands**. Grasslands near the farmstead (home farm plots) are normally used for grazing, and are considered as a separate grassland type with high value for the farm. In contrast, distant grasslands are mainly mowed, as it requires too much intensive labour to let animals graze there.

A few farmers also report having **legally protected grasslands**, such as 'Historically Permanent Grasslands'. They indicate that due to the limited permitted farm operations (e.g. no fertilizers, no chemical weed control), these grasslands are considered less useful, as they produce low-quality (lower protein content) and declining grass yields (ton/ha). These extensive grasslands often require a too high labour investment in comparison to the yield.

4.2 External drivers influencing grassland use and management

4.2.1 Perceived impact of the market on grasslands

By 'market' we mean the economic system of which the farm is part. This includes, for example, the prices the farmer receives for its production, and the costs s/he incurs to set up and run the business (such as land, machinery, labour).

Competition with arable crops: Most interviewed farmers grow potatoes next to fodder crops to gain an extra income. One farmer mentioned that grass is important, but that other crops would be preferable. Fluctuations in the prices of arable crops such as potatoes can lead farmers to choose to grow more (temporary) grass or protein crops ("*if the price of potatoes falls, I would sow more grass"*).

Costs of investments: The increased costs of investments (e.g. buildings, tractors etc) for livestock farming make farmers feel compelled to increase the scale of their operations and make production more efficient. One farmer mentioned that this is the reason why he chose to keep the cows indoors and not let them graze outside. With the livestock inside, the farmer has more control over feed quality and can keep a close watch on the health of the cattle.

Perceived indirect market drivers of changes

Land prices: In the interviews, the price of land was never mentioned as a direct driver for changes in grassland acreage and/or management. It is more likely a factor when there is a change of user or owner of the grasslands. Land price is certainly an important indirect factor. High land prices make it difficult to expand the area of agricultural land: "*You have to be lucky to be able to buy your own land as a tenant*." Some farmers mentioned that they could not buy a piece of land, as other buyers overbid them (Flemish Land Agency, horse owners). Several interviewees owned about a third of their land. The majority of the land used by farmers is leased (which is close to the Flemish average, around 60% according to the numbers of Landbouw en Zeevisserij). But there was a large difference amongst the interviewees: two interviewees owned almost all of their farmland, while another owned barely 5%. The dependency on leased or rented land puts farmers in a vulnerable position. One farmer mentioned having lease contracts for many small plots of land, owned by different landowners. Every year he loses some, because the owner wants to work the land himself, or because he wants to manage the land himself or to afforest it (to gain subsidies). Another farmer explained that when he took over the business from his father, many landowners did not want to renew the lease contracts. There are also strategic considerations for leasing less suitable grassland. One farmer mentioned that he stopped a lease contract because the land was difficult to work, while another stated that he did not stop it because he is also leasing more qualitative land from the same owner (in this case less productive grassland was located in the Flemish Ecological Network).

Perceived limited influence of the market

Market prices of inputs and outputs: Several farmers indicate that **the market** has little to no influence on the management of grasslands. Costs and prices are unpredictable: two years ago, fertilizer was very expensive and the price of milk was low, but now things are better. Management remains the same: you save during good years and lose during bad years. One farmer indicated that having a mixed farm helps stabilize income, one year the milk price is better, another year the other crops are more profitable.

Labels: A driver to optimize production can be a motivator for farmers to keep their cattle indoors. The question arises as to whether a 'pasture milk label' can command a higher milk price? However, several farmers argue that pasture milk is difficult to market. Some buyers (such as Laiterie Des Ardennes (LDA), "Charte LDA") award more points for grazing, as well as for the participation in agri-environmental agreements and for sowing grass-clover. However, this recognition of a specific use or management of grassland does not necessarily lead to a better price.

4.2.2 Perceived impact of technology

Changes in the use of machineries can also influence grasslands. Nine farmers mentioned 'technology and innovation' as an influencing factor. For two of them, technology led directly to a change in grassland use. More and more machines are being used in livestock farming, such as milking robots, a *Manitou* forklift truck for feeding, and heavier tractors for working the land (which makes it more difficult to work wet grasslands). A milking robot makes it possible for the cows to be milked

throughout the day, rather than at set times. To make the system work, the cows cannot wander too far away from the stable. This leads farmers to decide to mow most part of their grassland instead of having it grazed. By mowing the grass and feeding the cows indoors, the grass is used more efficiently, and milk yield is higher and has a more constant quality. Consequently, grazing is often limited to the farm home plot, while for mowing the proximity of grasslands to the farm matters less. Maintenance and water costs are higher, but less labour is required (for e.g. herding cows, maintenance fences). One farmer mentioned that the robot is the reason why he can keep working longer and maintain his grasslands longer than expected. In one case, the herd was expanded when purchasing one or more milking robots to ensure that the robot(s) are fully utilized. This, in turn, created a greater demand for grass(land).

4.2.3 Perceived impact government laws & regulations

Farmers complain in general about an **unsupportive or overly intrusive policyscape**. They often struggle with the complexity and unclear objectives of grassland regulations, including the restrictive nature of payments like the eco-scheme for grass, which limits farming interventions and creates uncertainty about allowed practices. Many policy instruments do not align with the way farm operations are conducted or decisions are made, and many feel that policies are imposed top-down without practical consideration for how they will be implemented. Another issue which is often reported is the administrative workload and the rigid policy calendars which hinder farm activities. Finally, many farmers doubt whether to innovate and invest in their farm as a result of the factors mentioned previously, but also because of regulation pressure, cattle quotas, pressure from neighbours and uncertainty about regulation. One farmer reported he felt the increased pressure from various sectoral policy objectives on the land. Quotes that illustrate how policy regulations are perceived as top-down by farmers:

> *“That's a bit of a disadvantage. Over there in Brussels, they decide this, that and the other. They don't have a clue what it's like on the ground. They only see the contour lines, and apart from that, little consideration is given to the environment, or to the farmer himself.”*
>
> *“Those are things that are imposed from above. For nature, insects or whatever.”*
>
> *"So those are some of the annoyances we have in the countryside. Someone from INBO insects is coming here, because I see that there are some poles. That person comes from Ghent, from the city. He does his work here, and then he returns to the city. But we are left here with overgrown grass and who knows what else... I have nothing against nature, you know…”*
>
> *“The number of hectares available always remains the same. Yes, definitely, more and more targets are being imposed, which means there is more and more pressure on those same hectares. We are always bringing in more and more people. Yes, it was definitely a pressure."*

Farmers mentioned 13 **specific measures** that hinder their farm activities (Table 1).

Table 1: Overview of specific policy instruments and their perceived impacts which were mentioned by interviewed farmers.

Environmental constraints	
Cattle quota (permitted livestock) per animal type (dairy cows, suckler cows and calves under 1 year)	It has a strong influence on farm development projections and decisions. In theory farmers should follow respective quotas per animal type monthly, meaning they would have to sell or buy animals regularly depending on population dynamics. The permitted livestock is linked to the operational permit which is based on emission rights, cattle manure processing and proximity to housing (for olfactory reasons).
Nitrogen reduction targets	The 30% reduction target for 2030 restricts farm growth perspectives.
Nitrogen decree	Farmers are unsure whether their practices meet the current decree requirements.
MAP, manure and nitrogen regulations	Grasslands are seen as an opportunity to valorise cattle manure. Overall, the nitrogen reduction targets and reported necessary infrastructure changes (e.g. new stables) further constrain growth and operational flexibility.
Fertilizer limits on pastures	One farmer stated that adding excess fertilizer on pastures reduces palatability, hence there is little reason to fertilize them too much. The farmer therefore questions the actual usefulness of limiting fertilizer application on grasslands which are grazed by cattle.
Grassland eco-scheme restrictions (nitrate and pesticide use)	Limited interventions allowed; uncertainty about permitted practices.
Obligation to inject slurry (instead of spraying)	Slurry injection breaks turf and encourages weed growth in grasslands. This seems to be a negative trade-off.
Instruments related to grassland management	
5-year rule for permanent grassland	As farmers want to keep their options open, they often plough a 4-year old grassland to avoid that it will be considered permanent grassland by the government. Several grasslands were converted 5–6 years ago due to expected bans, which also impacted grass production.
Mandatory 5 m grass strips along streams reduce productivity	5 m grass strips lower productivity and encourage weeds. One farmer even questioned whether these strips are useful at all for water quality.
Archaeological value	Historical or archaeological constraints can exclude farmers from compensations.
Agri-environmental measures (AEM)	AEMs are not aligned with farm operations, and do not fit daily workflows. (Note: there were very few mentions of AEMs during the interviews).
Maintenance of hedged grasslands	Hedges require substantial maintenance despite offering benefits to farmers as well. One farmer reported it is simply not possible with the available manpower, even if he wished to. Also, he felt there is no attractive compensation for hedge maintenance.
Instruments related to temporal management	
Fixed farm calendar	Fixed policy-defined farming calendars create constraints for many farmers. Increased seasonal variability enlarges the importance of this barrier.

During the interviews, farmers were asked to provide their views and recommendations, as to how policy could help them manage grasslands. This has at times been intercepted as recommendations to make their farming activity viable. When their current operations are grass based, both aspects (grass management and farm operation viability) are of course highly interlinked. Here is a range of **policy suggestions** that were **made by farmers** during the interviews. These suggestions are based on their respective perceptions:

- In general less policy interference and more flexibility.
- Less administrative workload.
- A clear(er) regulation framework with a 20 year long perspective for example, to reduce uncertainty and unpredictability.
- Less spatial planning changes to ensure continuity in farmlands.
- Desire to be less dependent on subsidies: A farmer is better off with a good price than with income support. With income support, once the funder is unhappy for some reason, you have no room for discussion.
- Get rid of the farm calendar, as it does not work well with seasons that are increasingly variable and require constant adaptation.
- Allow to use more animal manure (instead of chemical fertilizers).
- Issues like fertilizer limits, cattle quotas and slurry injections from the different MAPs disrupt farming efficiency, foster weeds (in case of slurry injections) and impact growth perspectives.
- Allow to structurally apply a combination of grazing and mowing grass in nature reserves (land owned by nature protection organisations).
- A possibility to report a number of 'problematic' plant species (in order to take action where otherwise forbidden). Restricting ploughing -tilling- and fertilization on permanent grasslands leads to the proliferation of invasive and toxic weeds like thistles, dock, and ragwort. Without the option to plough or use targeted chemicals, these plots can become unproductive over time, as manual removal is unfeasible at this stage.
- Support of the young generation of farmers.
- Acknowledge good farmer practices. Farmers often feel targeted by controls highlighting everything they are doing wrong.
- Listen more to farmer knowledge.
- Reduce the focus on moving away from pen-barns, as they are probably better than the very expensive modern barns.

4.2.4 Perceived impact of the social environment on grassland management

There is a limited impact of the social environment on how farmers experience their grassland. In a few cases, farmers mention that they are influenced by what **neighbouring farmers** are doing. For example, when farmers observed other farmers ploughing their permanent grassland, there was a perception that it was still possible, resulting in a peak in ploughing up grasslands 5-6 years ago (2019-2020?).

The most important impact of other actors is probably the competition for grassland with **horse owners** (see Chapter 5). The other side of the coin is that farmers sometimes can sell their hay to the horse owners, or help with the management of the grasslands of horse owners.

"You won't be able to get grassland as easily as you used to, there are lots of horses here... they're everywhere. But those men, they are taking over the land. Belgium is a horse country, you know. You can sometimes sell your hay to those horses."

During the Photovoice, a farmer was critical about how these grasslands are managed:

"There are a lot of 'horsification', riding schools. They speak of erosion, but when you see how much water runs off a horse pasture. That will surprise you."

Recreation can cause 'nuisances' for farmers, but have no direct impact on how farmers manage their grassland. Examples of these nuisances are: litter around walking trails passing through the grasslands, cyclists cutting through wire fences causing cows to wander onto the road, or cycling races resulting in difficult access to roads. However, recreational use is not always perceived as negative. During the photovoice workshop, one farmer was talking about the importance of grasslands for grazing, and mentioned that this value was shared by visitors.

"During Covid, there were many passers-by taking pictures of the cows in the field. 'Wa une vache', they said. That belongs in the image of the landscape, to have animals in the meadow."

Sometimes there are annoyances with **new residents**. Examples are: overhanging branches at farm roads that damage farm vehicles and equipment, limited access of farm roads due to parked cars, complaints from neighbours to the police about noise, residents challenging farmer requests for permits. But again, this has no direct impact on grassland management.

4.2.5 Perceived impact of climate change

Several farmers mentioned that the traditional management of grasslands - through mowing, grazing, and fertilizing - is now being challenged by climate change and that there is a yearly uncertainty about the timing of these activities. Depending on rainfall, wet grasslands can become **drier,** or dry grasslands wetter. In periods of drought, wet grasslands may become workable earlier in the season or even attractive for arable farming, for example in planting potatoes on non-traditional arable land. **Wet periods** during warm summers can produce very high grass yields, but can affect grassland workability and prevent mowing altogether, depending on parcel characteristics. This leads to highly variable yields from year to year, and explains why farmers like to have a diversity of grasslands (wet to dry gradient).

As grassland area and expected yield are aligned with livestock needs, there is a high pressure with often very high workload during very small **time windows**. This can bring mental stress to farmers. When bad weather results in a deficit in grass production, farmers can decide to temporarily convert arable land into **rotational grassland** for feed production. Consequently, the area devoted to secondary crops such as potatoes is reduced. However, major shifts in cultivated areas as a result of climate change are not reported.

In addition to the direct impact on grassland management, climate change is by many farmers also perceived as a factor affecting **livestock welfare**. Hot summer periods and heat waves negatively affect livestock health and reduce milk production. Some farmers mention hedgerows and tree lines

providing shading and cooling. Other farmers prefer to keep their cows indoors - especially in modern dairy farms with high milk production. What is common in these two strategies is the underlying concern for the welfare of their cows.

In summary, farmers in LVA experience a limited yet noticeable impact of climate change on their farm. It does not result in a change in grassland area, but it does affect the management of grasslands and the welfare of their livestock. Most farmers describe that climate change makes farming more complex, while simultaneously accepting that they cannot change the weather.

4.3 Farmer's decision making for grassland use and management

4.3.1 Grassland use and management in the context of the farm optimization

Overall, the **largest costs** for livestock farmers are labour costs (contract workers), infrastructural investments and concentrates.

Grass is the basis of their feeding strategy, and grasslands are only important for farmers because they have livestock. However, a good cattle ration consists of protein on the one hand and energy on the other. Protein is provided by grass, grass clover, cereals and protein crops (such as peas, field beans, clover and alfalfa); while energy is provided by fodder beet, beet pulp, maize, CCM (Corn-Cob-Mix), brewers' grains, cereals, etc. The more maize and fodder beet is added in the ration (compared to grass), the more concentrated feed that need to be given. So, while grass is the basis, maize and fodder beet are also included and supplemented with purchased concentrates (in order to provide a good ration). Maize has the advantage that it is easy to grow and that it has a less strict timing and management demands as grassland, while it has a high success rate and a very high dry matter yield per hectare.

Most farmers are also strongly focused on **self-sufficiency** to meet the feed requirements of their herd. Producing as much as possible on their own farm is cheaper, provides more control over fodder composition, and reduces dependence on global markets in times of economic uncertainty.

Farmers can employ two different strategies to use the grass:

1) Letting the cows **graze** is mostly used for 'dry' dairy cows, beef cows and young stock ('jongvee: vaarzen en kalveren'). It is considered the most extensive and cheapest method, but there is less control on the ration (uptake depends on the grass type and quality, weather, soil, grazing habit cows). Grazing takes place at permanent grasslands.
2) **Mowing grass and feeding indoors** is typically used for milking cows and calves. With indoor feeding, farmers have more control over the ration (protein, energy,..), cow health and milk yield. Also with indoor feeding, cows tend to eat more indoors. In this way, total production increases and farmers have a lower workload. Farmers want to be able to mow as much grass as possible to bring it to the stable or to ensile it for winter. Several farmers stated that anything that *can* be mown, *will* be mown. Especially when using milking robots, grazing is no longer obvious and this can lead to more mowing, more temporary grassland and/or shrinking of the home farm plot. For distant grasslands, some farmers indicated that grazing creates too much workload (transporting animals is labour-intensive) and makes it too difficult to control. Therefore, these plots are mown and ensiled instead.

Almost all farmers explicitly stated that they focus on **grass quantity and high quality** and how it can be improved. Grassland management is intensive Therefore they use the following strategies:

- Productive grasslands require **fertilization**. Manure from livestock is applied on arable land, while mineral fertilizer or slurry is spread on accessible grasslands. Grasslands that are grazed receive less fertilizer (twice per year), while grasslands that are only mown are fertilized 3–4 times per year. Permanent grasslands are allowed to be fertilized more than arable land (Uitrijregeling, Normen en richtwaarden).
- Farmers occasionally **over-sow** permanent grasslands with new grass species, or even plough up and reseed them with perennial ryegrass.
- To obtain high-quality fodder, farmers must **harvest and ensile** at the right moment, which is highly dependent on weather conditions and the growth stage of the grass. To optimize their operations, farmers must take many factors into account and make trade-offs at various stages of the production chain within the limits of their farm.
- Whereas permanent grasslands form the foundation, **temporary grasslands** are mainly used to ensure sufficient grass supply and this acreage is therefore flexible. Particularly in the case of indoor feeding, temporary grasslands are attractive. Many farmers observe higher and better-quality yields in temporary grasslands compared to permanent ones. Another advantage is that when included in a crop rotation, temporary grasslands improve soil quality for the subsequent arable crop. However, a shift to temporary grasslands has not been observed yet among our interviewed farmers as most of them already have enough grass feed from their permanent grassland, and any remaining land not used for other fodder crops is planted with potatoes or other crops.
- Half of the interviewed farmers started using "**grass-clover**" which they maintain for 2 to 3 years. It is perceived positively as grass-clover because of the higher protein content, it can stand drought better, and it improves soil quality (providing a more qualitative crop afterwards). One farmer mentioned that it is better to mow grass-clover and feed indoors than let it graze, as cows tend to leave the clover. The subsidy for integrating legumes such as the 'grass-clover' mix in the crop rotation serves as an incentive for the farmers. Dairy farmers also experience a more positive consumer perception of milk produced from grass-clover mixes.

4.3.2 Personal values in relation with the use of grasslands

Farmers see themselves as **businessmen** who generate income from the market (rather than income support). During the Photovoice workshop one farmer said:

> *"We, the farmers, are not a charity organization; we do not keep pets; we have to earn our living with our work."*

Throughout the interviews, farmers mentioned several personal values that potentially influence their grasslands use and management. First of all, grasslands are kept to feed the cows, and the livestock is kept out of **love for the animals**. During the Photovoice workshop, farmers mentioned the joy that comes with watching your young cattle play outside.

"You grow up with the animals. (…) If I were to say, 'Okay, yes, we're going to stop milking', I would consider choosing another breed, either a beef breed or something else, but still with animals."

"The young cattle are frolicking, playing, and fighting. It's a wonderful feeling every year when the young cows go outside." Another farmer added that "[t]here are two feelings during that time of year: you're happy that they're outside, and you're afraid that they'll break out."

Consideration of **animal welfare** can also influence the use and management of the grassland. Several farmers stated that it is important for them that cows can graze outside. Some farmers mentioned it as a reason to keep the home farm plot and trees on the grassland so it can offer shade for the cows. On the other hand, some farmers prefer to keep the cattle inside, stating it is easier to keep an eye on them and quicker to spot when they are sick. In one case, the grassland around the stable was kept even though the cows stayed inside, just in case of fire.

"A cow should be able to go in the pasture, it's good for their feet. It's a bit an emotion, but a cow that walks outside is still (…) it's better if they can walk outside, and stretch their legs".

The **pleasure of managing grass** is a subjective value that came up, especially during the Photovoice workshop. *"Mowing the ryegrass is the most fun, but most hectic period."* For the farmers, ryegrass speaks to the senses: *"The smell of fresh grass, if you could only bottle that.*"

Several farmers discussed their role in **keeping the landscape** as it is, meaning maintaining a diversified landscape with grasslands both on sloping and flat parcels.

"Everything I do is nature. (...) If we're not there, everything turns to forest. Now there are open spaces between it, if that closes up, the Vlaamse Ardennen loses its character."

"Agriculture and nature can perfectly go together. It is actually the farmers that make the Landscape Park. If you forest it all, you only have forest." (Photovoice)

Perception of nature

We also asked the interviewees how they perceive 'nature' on their farm. These perceptions are not directly drivers for maintaining grasslands, but offer some insights how farmers relate with their environment. Most farmers see **agriculture as nature.** Farmers create nature, as crops are also nature, though one farmer specified that a field full of thistles is not nature for him.

"Farming is the biggest part of nature."

"I think I am more a nature person than most people."

Three farmers talked about **working together with nature**.

"It's strange to say, but nature is actually everything to a farmer. You work with nature, you take care of it. Like I said earlier, there isn't a single farmer who would fertilize his land or do

something wrong, or start working his land too early. You say, it's too wet, we're not going to start. You work with and for nature, that's what I mean."

Some farmers refer to a desired **landscape** quality in the Vlaamse Ardennen and to the role of farmers as creators of the landscape. Some farmers mentioned that they do not want compensation for the actions they take, such as for pollarding trees, managing hedgerows, protecting lapwing's nests or hanging nests for swallows.

"Nature, yes, authentic waterways, pollard willows, everything like it was in the past."

Forests are mentioned by several farmers. The value of forests for nature is considered, but afforestation is considered as a threat for the landscape and for agricultural land. Several farmers say there "*shouldn't be more*". One farmer compared a forest landscape with an open landscape, preferring the second:

"I don't know, that meadow next to the highway is a magnificent meadow, no houses in sight. As a little boy, I thought it was magnificent. Sometimes they want to turn those areas into forest, but when you're standing in a forest, you can only see the first tree behind you and in front of you, and that's it. And I see huge forests in the distance, but I also see pastures with cows. Isn't that nature? Apparently not for some nature lovers."

4.3.3 Labour availability and succession

Grassland management should fit the amount of **available labour** (needed to daily check animals, maintain fences, etc). When farmers take up an additional job, they will reduce their livestock. One farmer mentioned that when his father stopped working in the farm, he decided to mow grasslands instead of letting the cows graze, because herding cows to the desired field required two labourers.

Of our interviewees, two farmers have a **successor**, while three farmers indicated that they do not. For six farmers, the succession is unsure, mostly because the children are too young. Three farmers stated that they are not sure they would recommend the farming business to their children. According to one interviewee, the lack of successors is due to a combination of factors, such as the need for large investments due to high land prices, the cost of materials, and the size of today's farms.

Grasslands are at risk when farmers retire without having a successor. In that case, he either stops or continues to be a part-time farmer, with possibly support of hired labour. What typically happens is that animals are sold (or at least significantly reduced in number) to reduce the work pressure and to have more opportunities to have a day off. In addition, some retirees switch to arable crops, which usually offer higher returns per ha and demand less labour (which even can be outsourced). As a result, grasslands become obsolete for the farmer, and are then sold, leased out or ploughed into arable land. However, this is not always the case, as there was also an interviewee who indicated wanting to start again with beef production after retirement and another interviewee who mentioned that new machinery made the work easier and would allow him to keep up livestock farming longer.

4.4 Perceived ongoing trends and expectations of changes in grassland acreage

Stability of grasslands in optimized farms

For most farmers their farm **grassland area did not change**. Also for the short-term future (5 years), most farmers do not expect significant changes in their grassland area. Grassland area is dependent on the size of the herd, or vice versa. In addition, in the Vlaamse Ardennen, there is a lot of land which cannot (easily) be used for crops (because it is too steep, too wet, close to streams), so keeping grasslands and cows is a logical option. In addition, the home farm plot is essential for milk cows walking in and out, even if it is suitable for arable crops.

Some farms even bought **extra grasslands** and/or seeded new grassland. Mentioned reasons are: increase of the number of cows, need to expand grassland in proximity to the stable, too wet arable land, or the manure quota (when farmer has not enough land to deposit its farm manure). In such cases, grassland is usually bought from retiring farmers who sell their grassland.

But the **management** of their grassland has gradually **changed** over time. Due to use of new milking systems (e.g. milk robot) and/or reduction of available labour, several farmers decided to have their cows only around their farm, and to do more mowing instead of grazing. As a result milk cows spend more time in the stable, and less in the field. Also, there is more rotation with temporary grassland, and there is some experimenting with 'grass-clover'.

But, a declining trend of grasslands in LVA region

Farmers observe that in the LVA region, despite the livestock farms getting larger, the overall number of cows is declining (due to the fast decline of the number of farms). Consequently, most farmers observed a **declining trend of (permanent) grasslands** in de Vlaamse Ardennen. At the same time, it is expected that over time all the **'**good' parcels of grassland will be ploughed and become **arable land**. The main reasons are: retirement (own use or sale), another job, declining meat prices (which encouraged some farmers to stop raising beef cows), shortage of labour, and introduction of a milk robot. On the other hand, arable copping of potatoes and onions is more profitable and it is less labour-intensive. There is also an increasing demand for renting land from potatoes/vegetable farmers. When a grassland is considered not profitable (e.g. too far away, protected status), then farmers stop the lease, sell it or even abandon the grassland (resulting in weedy and bushy fields).

The new generation of landowners is more likely to sell their land. When a (leased) grassland is being sold, chances that a livestock farmer can purchase it are slim, because there are many **capital-rich buyers** who are searching for land (e.g. industrial farmers, horse owners, government agencies searching for reforestation or industrial land, wine growers, camping owners, newcomers searching for houses with big gardens). Many farmers mention the impact of 'horsification', but some farmers assess this impact higher than others (depending on the region, e.g. one farmer claimed that in Horebeke there are more horses than cows). This trend is expected to continue in the future, but buying big farms is now only possible for horse breeders (from the policy point of view it is considered as agricultural activity), and not anymore for equestrian centres. This resulted in the emergence of 'fake-farmers'. On the other hand, renting out grassland to horse owners can yield up to a third more than renting to beef farmers. Wet grasslands in valleys and steep slopes are often earmarked for and

bought for nature development. These grasslands are relatively less profitable for farmers and interesting for nature development. But in this way farmers lose their buffer to cope with dry periods and climate variability.

Government pressure to reduce emissions or the number of cows per farm (in the past: milk quota, now: environmental restrictions) make grasslands either less attractive or irrelevant for farmers to invest in, and will likely result in the gradual decline of grasslands. Also, the 5-year rule for permanent grassland is often mentioned as an incentive to transform them into an arable field (esp. potatoes). In this way, farmers can keep their options open, esp. for their retirement. There was a peak in ploughing grasslands 5-6 years ago, as there was a perception that it was still possible and as farmers observed other farmers were ploughing their grassland. In some cases, government agencies are buying up farmland, or providing subsidies for afforestation to nature organisations. If a farmer is not permitted to change non-useful grassland into arable land, then they have a few options: sell it, rent it out, make a contract with the government (Manure Bank, agri-environmental scheme).

Looking 25 years ahead is difficult as most interviewed farmers will be retired by then, and they find it difficult to assess what will happen to their farm and grasslands. The expectation is that there will be fewer young farmers who want to be milk farmers (as it is not attractive), that animal numbers will decline, and that there will be a decline of permanent grasslands. On the other hand, one farmer stated that steepland will remain grassland.

> *"We have a lot of permanent grassland on our farm, which can only be used for livestock. On the other hand, we are no longer allowed to keep animals? What should we actually do with that grassland?"*
>
> *"No animals, no grass. You can't eat grass, can you?"*
>
> *"Grasslands can be converted to arable farming, but the closer you get to the Vlaamse Ardennen, the more hilly it is, and the more difficult it becomes."*

5 Factors influencing grassland decision making of 'new' grassland users

In this chapter we analyse the factors affecting the decision making of 'new' grassland users regarding their grasslands and their impacts in Landscape Park Vlaamse Ardennen (LVA). These activities are not per se new, but their increasing popularity in the region is a new trend. This section is based on 7 interviews of 'new' users of permanent grassland. The results are summarised in the mind map (Fig. 10).

5.1 'New' grassland users typology and management

Most of the interviewees are originally from the region and some have been living there for many years. They are a very diverse group of land users, and they can be distinguished based on:

1. The main activities taking place on the grasslands: alpacas (2x), sheep (2x), donkeys, horses, bison, and mixed (mowing contracts and recreational use as a garden).
2. The level of professionalism: hobby (2x), second job (4x), main job (2x).
3. The size of their grasslands: Ranging significantly from 3 to 120 ha. Hobby and second job grassland users have between 3 to 15 ha grassland, while professional users tend to have larger acreage (between 28-120 ha).

The official land parcel designation of the users' grasslands was not taken into account. The agricultural status of these users remains unclear due to varied and sometimes confusing terminology regarding agricultural registrations.

The grasslands are mainly located near the home or the main base of their activities. In most cases, they are **owners** of the grasslands. The origin of these parcels varies among the respondents: either the parcels were included when buying the property or were acquired or rented later. When taking into use or purchasing a parcel, local relationships often play a crucial role. Parcels may become available because a farmer stops farming or because a parcel is too difficult to cultivate. This highlights the importance of personal connections and practical considerations in land acquisition processes.

5.2 Perceived drivers and motivations for grassland use

With 'new' grassland users, **intrinsic motivations** are the most prevalent reasons for conducting their grassland activities. An interest or a passion for animals is what drives most of them, and they enjoy being outdoors (Fig. 12).

The 'new' grassland users mostly have a **positive relationship with nature**, even though they view it in different ways. Some appreciate nature intrinsically, for its species of birds, plants or other animals. While others give nature more relational values, such as *"care for nature is care for humans"*, *"experiencing the wonder of nature*" or *"nature is our landscape".* Mostly it was a combination of different values.

The users report having a **good relationship** with people in their surroundings and local farmers. There are almost no major conflicts, only occasional minor complaints (e.g. exotic species, colour of fences, use of pesticides). The majority mentions positive reactions from their social environment, with five explicitly stating that neighbours and passers-by are happy with the presence of their animals. Six respondents collaborate with farmers, for example to dispose of their manure on (other) farmers' fields, winter grazing with sheep on farmers' fields, or temporary management of grassland parcels by farmers. This cooperation reflects a practical and mutually beneficial approach to grassland management in the local community.

Market influences only the grassland users (2x) who have primarily economic motives, such as bison meat production, or renting out grasslands (to other farmers, horse owners).

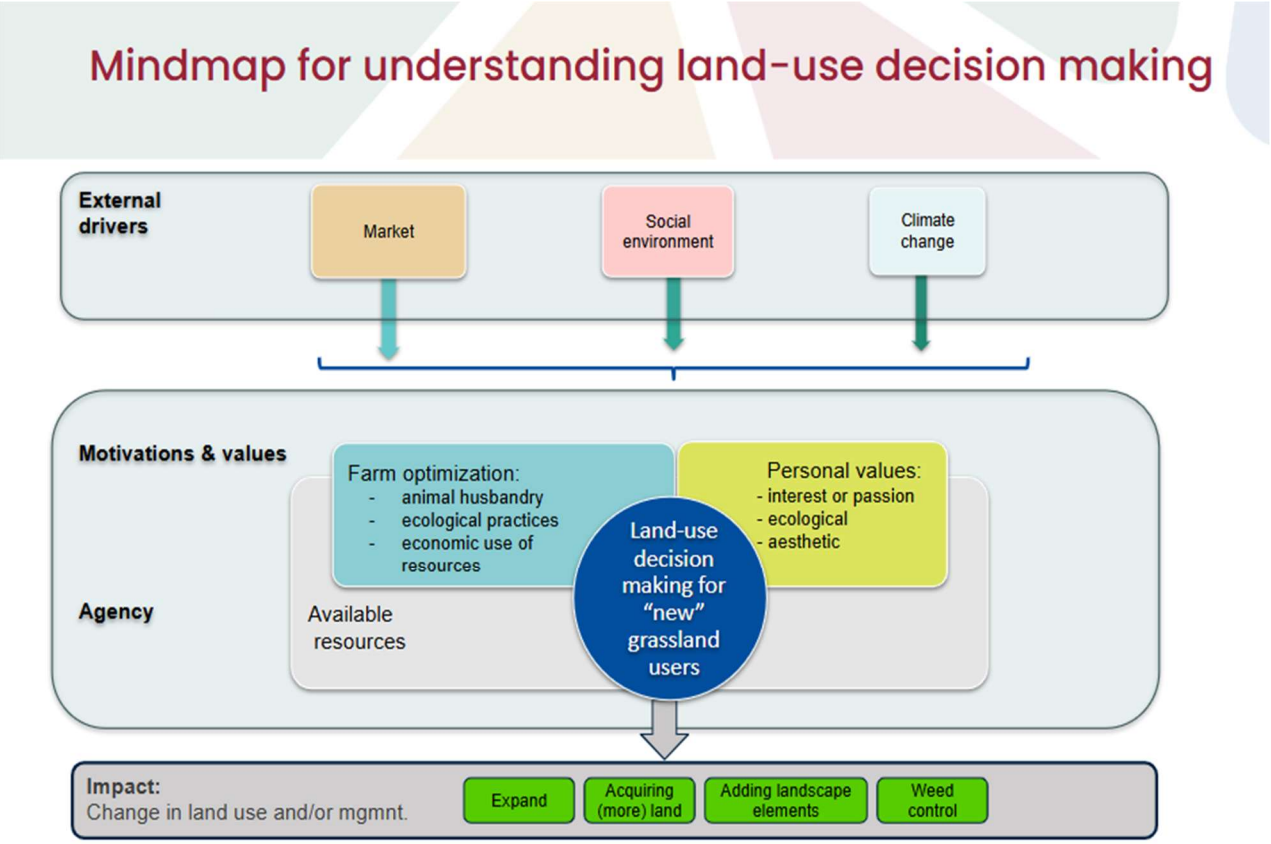


Figure 12: Mindmap of the factors influencing maintenance or changes in grassland use and management by the 8 interviewed 'new' grassland users.

5.3 Changes of grasslands by 'new' grassland users

As this is a new emerging group of grassland users, this type of use is **expanding** in the Vlaamse Ardennen. To reduce the risk of over-grazing (or drought), some of them aim to further expand their grasslands.

The 'new' grassland users want to optimally **manage** their grasslands for their specific animals. Similar as livestock farmers, they let their animals graze, mow, make hay, and add fertilizers to increase grass yield. Toxic plants harmful to animals are removed, by either manual removal or by the use of herbicides. Some more-ecologically oriented grassland users plan to add or maintain landscape elements, such as trees and shrubs in and around the grasslands.

6 Discussion and reflections

6.1 Methodological reflection

We used a mixed methods approach, combining a literature study, quantitative data from historic modelling, with qualitative data originating from semi-structured interviews and the photovoice workshop. Our results, in which we discuss the factors influencing grassland decision making, are based on the perceptions of farmers and 'new' grassland users. These perceptions to some degree

confirm the trends and drivers identified in the quantitative study and the literature. Another iteration, whereby we verify some of these perceptions, e.g. the number of horses, might strengthen the claims made in the report.

The research process was iteratively discussed and coordinated with the Policy Lab, during monthly meetings. Furthermore, our understanding of the topic was broadened during several workshops, where we, for instance, discussed the value, threats and opportunities of grasslands from different perspectives. The results in this report were presented in a Policy Lab meeting, and most members of the Policy Lab also read and thoroughly commented on this report. The iterative process ensures that validation of the results and that the focus of the research is relevant for the Landscape Park. The discussion section will serve as a basis for the development of more concrete policy interventions.

Regarding the selection of participants for the interviews and the photovoice, we had a good variety of types of farmers, and the addition of 'new' grassland users provided a good variety of perspectives. However, by limiting the selection of farmers to those who had or used grasslands in the past five years, we likely missed some farmers who stopped having grasslands before that. Furthermore, with one exception, we only included active farmers. Some factors, such as the impact of retirement, would likely have been more deeply discussed if we included retired farmers and farmers who sold all of their grasslands.

6.2 Major drivers and motivations that steer the maintenance or change of LVA grasslands

On the level of an economic operational farm, there are limited changes in grassland acreage on the short-term, but there are identified changes in the use and management of grasslands. One of the main trends is that lactating dairy cows are increasingly kept indoors and fed mown or ensiled grass, while dry cows and young stock often continue to graze outdoors. As a result, less grassland is grazed and a larger proportion is harvested for mowing. This trend is influenced by new technologies such as the milking robot, and a desire to optimize the feeding strategy and keep a close watch over the cows. Climate change, and more specifically heat stress, are expected to contribute to this trend. Another change is the increased use of grass-clover in temporary grasslands. The drivers for this trend are the higher nutritive value of grass–clover, better adaptability to climate change (drought in particular), and the availability of eco-scheme payments ('ecoregeling').

In our group of interviewees we noticed **increased specialization of farming,** a trend that has been identified in literature (a.o. Schut et al., 2021): mixed dairy-beef-arable farmers had converted to mixed dairy-arable farms, and one dairy-arable farm converted to a purely arable farm. These changes can be economically justified: the average profit of milk production is higher than of beef production, while the average profit from profitable arable crops is higher than of livestock production (with the side remark that there is some fluctuation in profitability between arable production and dairy production). If this trend continues on a larger scale, this certainly must be regarded as a driver for a decline in livestock farming and the loss of grasslands.

Some farmers converted a parcel of permanent grassland into arable land and several farmers rotated temporary grassland with arable crops. These are indications that there is a **competition between**

grassland and productive arable crops. Aside from growing fodder crops, all interviewed farmers - except one - also grow potatoes and sometimes other arable crops next to (or instead of) their livestock activities. On average, potatoes have been the most profitable crop for the past fifteen years, with an increase in price far outweighing the increase in milk or cereal prices. As the historic potato price crash of 2025 shows, this is not a given (De Standaard, 06.08.2025). Still, most of our interviewees, potatoes are considered as a secondary crop limited to parcels which they do not directly need for fodder and grass production. Only one dairy-arable farmer indicated that arable crops, in this case mainly brussels sprouts, became their largest source of income.

Of the total area covered with grassland in Vlaamse Ardennen in 2022, 87% is permanent grassland and 13% is **temporary grassland**. There seems to be a gradual trend towards more temporary grasslands. Temporary grassland offers greater crop flexibility and often higher forage quality in the short term, while permanent grassland excels in carbon sequestration, soil development and biodiversity in the long term.

Many farmers are financially dependent on **direct income support** from CAP funds. Currently, these funds are fundamental for the viability of livestock farms, especially for beef farms, and therefore indirectly lead to maintaining grasslands. Between 2015 and 2021, the average share of direct income support in the gross farm revenue for beef farms is 74% and 13% of the average net income. This is a consequence of a large amount of direct payments and a low average total revenue on these farms. For arable farmers and livestock farmers, the share is on average 35% and 25% of the farm income or 10% and 6% of the revenue. Furthermore, **agri-environment-climate measures** can also provide positive incentives for maintaining permanent grasslands, but they are not very popular (27 ha).

On the other hand, farmers perceive the **policy context** not favourable for livestock farming, putting an increasing pressure on farmers. On one hand, they feel a lot of restrictions (herd quota, nutrient loss reduction, distance to streams, rigid farm calendars) which limits their freedom of operation and reduces their profitability. Moreover, many of the policy instrument mechanisms do not fit the way farm operations are conducted, or farm decisions are made, and many feel that policies are imposed top-down without practical consideration for their operations. On the other hand, they feel uncertain due to the complexity and unclear objectives of grassland regulations and the constant changing of rules (e.g. PAS). Finally, they often reported the administrative workload. All these factors make that their future outlook is not positive, and that farmers are hesitant to invest or take over the farm of their parents.

Personal values and perceptions are important to take into consideration, though they are rarely mentioned as direct drivers for maintaining or changing grasslands. Livestock farmers see themselves in the first place as entrepreneurs who produce food for the market. On the other hand, they are also intrinsically motivated to work with animals and to take care of animal welfare. These types of values influence the choice to either graze or mow grasslands (Van den Pol-van Dasselaar et al., 2020). Furthermore, several farmers see themselves as indispensable for conserving the desired, diversified landscape in the Vlaamse Ardennen, which grasslands are part of.

For the farming system, **changes in labour availability** can also be an impactful factor for grassland management. In our interviews, changes in labour were mainly mentioned in relation to intergenerational collaboration, retirement and second jobs. The moment of **retirement** is frequently mentioned as a fundamental cause for the loss of grassland. Only a few of our interviewees were

certain about having a successor. When there is a lack of succession, due to economic or policy drivers and/or personal choices, farmers often choose to convert their livestock farm to an arable farm, because it requires less labour and can generate more profit. In the next stage, retired farmers without succession sell their land. There is often a fierce competition to buy these grasslands between farmers, government agencies (e.g. nature conservation agency), 'new' grassland users, farmers from (far) outside de Vlaamse Ardennen (who are less familiar/concerned with the local characteristics of the land), and new residents. When these grasslands change hands, there is a high chance of other land management.

At the **regional scale**, although many farmers reported a decline in permanent grasslands in the Vlaamse Ardennen, the spatial analysis over the period 2013-2022 did show only a net 1% decline. However, this can hide internal changes of grasslands. The spatial analysis indicated that permanent grassland has changed into temporary grassland (-96 ha), arable land (-300 ha) and 'other land-use' (-290 ha); while permanent grassland has increased on the expense of 'other land-use' (+212 ha), arable land (+87 ha) and temporary grassland (+341 ha). As the latter is likely a side-effect of new European registration rules, we can assume that the decline of permanent grasslands is around -7,5%.

Another dynamic is the emergence of **'new' grassland users** which can only partly be identified in the spatial analysis (as quite some new grassland users have an official farm number), such as nature conservation organisations (converting agricultural grasslands to biodiverse grassland or forests), horse breeders, people who keep animals as a hobby and residents with large gardens. The group with hobby animals is a particularly expanding group. These 'new' grassland users are primarily driven by intrinsic motivation, acting out of personal interest, passion, and/or ecological convictions. They enjoy being outdoors and value a positive relationship with nature. Markets and policies (e.g. soil management, soil conservation) have less impact on this group, except for those who make an income from these 'new' animals (such as horses, bison, alpaca).

6.3 Relevance of grassland dynamics in Vlaamse Ardennen for other areas in Europe

Grasslands used for **dairy and beef cattle** are **decreasing** most clearly in intensively farmed lowland regions of Western and Northern Europe (e.g. parts of the Netherlands, Flanders in Belgium, northern Germany, Denmark, northern Italy) and in many Central and Eastern European countries where large areas have been abandoned or converted since the 1990s (e.g. Romania, Bulgaria, parts of Poland, Czech Republic, Baltic states, Slovenia, Hungary) (van Vliet et al., 2014).

In Intensive lowland dairy regions (West/North Europe), the share of grassland in dairy farm area has fallen in many regions as maize silage and concentrates replace grass in high-yielding dairy systems (Huyghe et al, 2014). Denmark shows an annual decline of permanent grassland of about 0.5% while temporary grassland is used more flexibly within arable rotations (DairyClim, 2016). Similar patterns of conversion of permanent grassland to temporary leys or arable land are reported in parts of France, Germany, the Netherlands and northern Italy, often despite national safeguards (Huyghe et al, 2014).

One of the main trends observed in Vlaamse Ardennen is the trend of **mowing grassland instead of grazing**. Despite there are few long-term data on grazing available in Europe, researchers in several

countries confirm that this trend also takes place in other Northwestern European countries. There is large variation both between and within countries. In Denmark, dairy cattle did not graze increased from 16% in 2001 to 30% in 2003 and it is still increasing. In the Netherlands the number of grazing dairy cows has been monitored rather intensively from the early 1990s onwards. In Luxembourg, it is estimated that up to 10% of the national herd does not have access to pasture; also the number of grazing animals is decreasing. In the UK, it was estimated that less than 5% of the dairy cattle did not graze in 2005 and this number is increasing. In countries Norway, Sweden and Finland have welfare legislations stating that cattle must have access to pasture or alternative exercise areas outdoors for a minimum period of time during the summer (six weeks to four months depending on location). On the other hand, grass-based seasonal systems of milk production predominate in Ireland. The length of the grass-growing season varies from about 8 months in the northeast to up to 11 months in the extreme southwest (Van den Pol-van Dasselaar et al., 2008). As in the Vlaamse Ardennen, the trend is driven by a complex interaction of structural changes in farm management, technological advancements, nutritional requirements of high-yielding cattle, and environmental pressures (Van den Pol-van Dasselaar et al., 2008).

6.4 Potential intervention areas for the Landscape Park and policy

Based on the topics raised in this study, a number of potential policy intervention areas can be identified to enhance the quality and distribution of grasslands in the Landscape Park. These intervention areas will drive the analysis in the upcoming report D3.2 and guide future policy recommendations.

1. **Matching policy objectives with farm rationale**: More interactions between farmers and policy developers have several advantages:
    - It can help farmers to better understand policy objectives and how these relate to policy instruments (such as regulations and subsidies). By clarifying the purpose of measures, this could foster more acceptance and response among farmers.
    - It will enable policy developers to integrate more farmer knowledge and perspectives (such as how farmers operate and make decisions). This can assist policy to better identify trade-offs and inconsistencies between policy measures, increase the coherence between policy measures, increase their practical applicability, and support the (re)design of policy instruments, making them more actionable.

On the other hand, some stakeholders mentioned that a range of policy measures, such as livestock reductions, result from political rationales and will likely have to be discussed at that level first.

2. **Consistent grassland definitions**: Policy lab meetings revealed that inconsistent definitions of 'grassland' across policy sectors hinder the monitoring of trends. Standardizing these definitions will be essential to effectively measure the impact of any proposed interventions.
3. **Reducing administrative workload:** The administrative burden is a well-known issue and a priority on the European agenda. Two non-exclusive approaches can address this: reducing the administrative requirements imposed by various agencies, and integrating these requirements where possible.

4. **Flexible policy calendars**: Fixed calendars for farm activities often frustrate farmers, especially as they are increasingly incompatible with seasonal variations caused by climate change. A more flexible, season bound alternative is needed here.
5. **Recognizing and rewarding farmers as landscape managers:** Recognizing farmers' efforts by product origin labels, local initiatives or positive feedback from regulatory bodies could improve morale and engagement with policy measures. It relates both to their role of maintaining ecosystem services and biodiversity, and ensuring landscape attractiveness. The landscape park is interested to look further into the potential role of farmers as landscape managers, including the economic conditions that would be needed to operationalize that role.
6. **Adding a new dimension to compliance**: Farm compliance control is carried out by several public agencies and is often perceived negatively by farmers. This is because it directly results in subsidy cuts or fees and is viewed as overly stringent. At the same time, environmental gains resulting from controlled measures or monitoring are not flowing back to the farmers. In that regard, it could be useful to add a learning component and a system of corrective actions for non-compliance before moving straight to sanctions. Communicating the results of (non-)effective measures would also help contribute to greater recognition of their efforts (see also point 4).
7. **Farmer agency**: Farmers have reported a perceived loss of control on their activities. The question arises where and how farmers could increase their influence, either through cooperations, by shortening their value chain (transforming and selling locally) or through the work of the Landscape Park.
8. **Ensuring better farm succession:** The lack of farm succession is a significant trend that could lead to substantial land-use changes. This is already occurring in some cases, such as retiring farmers without successors converting grasslands to arable land, or selling their land. Ensuring continuity by making livestock and grass-based farm activities more attractive and profitable (whether for existing or alternative farm models) should therefore be a key focus.
9. **Addressing market instability and investment security:** Many farmers also expressed ambitions to achieve self-sufficiency in inputs. Doing so increases the control they have over their activities (see also point 6) and makes them less dependent on volatile market prices (e.g. for feed concentrates). Providing income stability by partially decoupling farms from these markets could be a powerful tool for land-use change, specifically by promoting grass-based rationing and ensuring fair, stable prices for meat and milk outputs. Other aspects to address to create more secure investment conditions include renegotiated contracts with the agro-industry, rapid changes in policy requirements, rising land prices, shorter lease durations, and local conflicts (e.g., with neighbours or municipalities).
10. **Valorise grass and clover-based farms:** Some farmers in the Vlaamse Ardennen achieve successful results in dairy farming with high-productive grass/clover systems with minimal maize. Promoting this model and simulating its operational benefits is a crucial step toward maintaining or even shifting the landscape composition towards more grasslands in the short term. This transition would likely require no legislative changes, but a targeted support strategy from the Landscape Park and partners. It is however unclear at this stage to what extent it could be outscaled for farmers with lower land to cattle ratios.
11. **Anticipating the impact of new technologies:** It is important to assess in advance which technologies are potentially harmful and which can offer potential opportunities. Exploring ways to influence technology adoption (preferably before farmers invest) could be beneficial and would

require ex-ante impact assessments. Examples of important past technological innovations are for example milk robots, new modern stables to host cows, increasing milk production per cow through genetic selection, etc.

12. **Resilience to climate change:** Climate resilience is becoming increasingly important for farmers. Adapting grassland management (such as earlier harvesting or using more robust seed mixes) will be essential. This will require innovation, including peer-to-peer knowledge exchange. More emphasis in climate policies on the value of grasslands for carbon storage may also help ensure that this value is appropriately safeguarded or developed.
13. **Working with 'new' grassland users:** Often, 'new' grassland users do not fit within current policy frameworks and thus remain overlooked in policy interventions. However, they could also potentially contribute to the objectives of the Landscape Park. Policy options are: engage them in the maintenance of the bocage landscape, encourage them to plant hedgerows and to develop their pastures into more natural and biodiverse grasslands (Degezelle et al., 2022), and stimulate cooperation with livestock farmers.
14. **Opportunities for multi-species productive grasslands (MSPG)**: MSPG can provide several benefits to the farming system, compared to usual permanent grassland (Janssen and van Eeckeren, 2025; LV link; B3W). With nitrogen inputs, MSPG provides higher and more nitrogen-dense yields than intensively managed permanent grassland (O'Malley et al., 2025). Moreover, the yield of MPSG is less volatile depending on dry and wet years, which make them more resilient during climate change. Finally, many of the herbs have health benefits for the animals (anti-parasitic properties).
15. **Opportunities for semi-natural grasslands:** They are owned by farmers and/or nature organisations). Farmers could maintain these grasslands by mowing or grazing, on condition that the fodder has minimum quality standards (protein, energy) and that the stage of the cows (e.g. 'dry' cows) or livestock breed (e.g. local double purpose breeds, Limousin) is adapted to this type of fodder. These semi-natural grasslands can have an economic valuable role for cattle farms where grazing is an important part of the business operation and where extensive grasslands amount to no more than 1 hectare per 10 productive dairy or suckler cows (for dual-purpose breeds or more extensive breeds this can be 2 hectares or more) (Indeherberg et al., 2018; Sannen et al. 2025).

These policy interventions will be further researched and discussed in Deliverable 3.2, and special attention will be paid to the potential role of landscape parc Vlaamse Ardennen.

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