

Variability of European farming systems relying on permanent grasslands across biogeographic regions

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Introduction

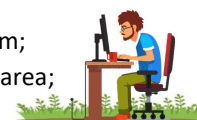
Based on regional differences, the ability of different **farming systems (FS)** to deliver **ecosystem services (ES)** can vary widely. Therefore, it is important to recognise which factors differentiate FS from each other, to address further actions aiming to **improve productivity** and **sustainability**, **create resilience**, **optimize farm profitability**, and **deliver ES** for the society.

We implemented a **new FS typology** within the H2020 project 'SUPER-G' (Developing SUSTainable PERmanent Grassland systems and policies), aiming to identify the main FS that rely on **permanent grasslands (PG)** across Europe.

Methods

A dataset of **41.926 single-farm** records located in 28 European countries was retrieved from the 2017 **Farm Accountancy Data Network (FADN)**. Each farm was assigned to a class according to four descriptors:

1. **main livestock species/category** in the farm;
2. **stocking rate** on total utilised agricultural area;
3. **PG share** of the UAA;
4. **biogeographic region (BGR)** where the farm was located.



The resulting dataset containing the four qualitative variables was used to build our new FS typology and then to perform a multiple correspondence analysis (MCA).

Main findings

The **five BGR** separated quite well in the first two MCA dimensions, depicting **contrasting main FS** across Europe:

Alpine Beef cattle at relatively low stocking rates, with intermediate to high PG share per farm, highlighting the extensiveness of the farms;

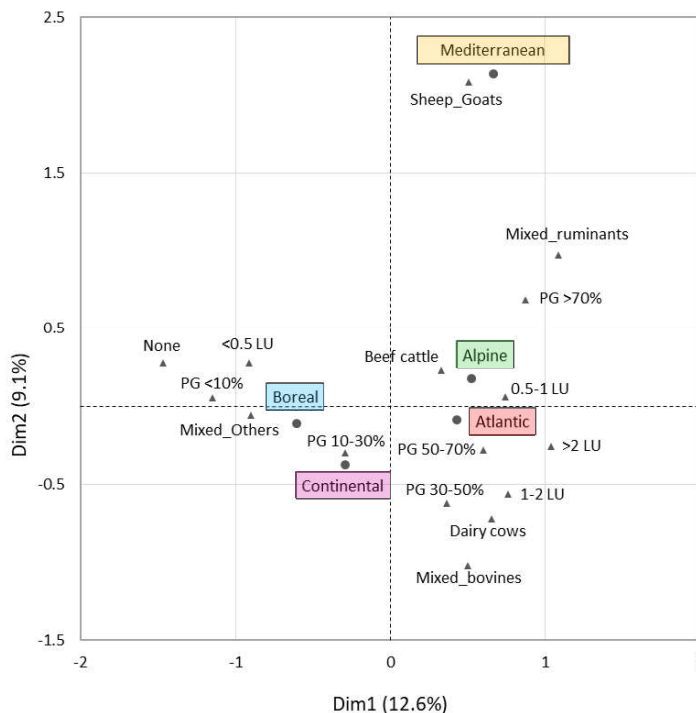
Atlantic High PG shares with high stocking rates and mostly 'Dairy cow' farms, indicating more intensive farms;

Boreal Farms with mixed livestock or no livestock, very low PG share (dominance of temporary grassland) and very low stocking rates;

Continental farms with relatively low PG shares without clear livestock category or stocking rate, probably due to the high variability of environmental and socio-economic conditions in this BGR;

Mediterranean farms strongly related to the presence of sheep and goats, typically able to exploit low quality forages.

Variable categories - MCA FADN



Conclusion

The FS typology developed for SUPER-G provides a selection of **factors that can be used to distinguish farming systems that rely on PG** according to their level of management intensity, and the delivery of associated ES. Such a typology helps understand the **variability of farming systems across the BGRs of Europe** and **the role of PG in supporting each of them**. The typology could also be important for **grading farms according to their ability to deliver ES** to society, while promoting the development of **sustainable management practices** and **agri-environment schemes**.

