Biodiversity of grasslands versus farm characteristics. Methods for evaluation of HNV grassland areas and efficiency of agri-environment schemes

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Introduction

This study focuses on farming and nature conservation in the National Park Mala Fatra in northern Slovakia, a mountainous area with a mixture of very small-scale, extensive farms and some very large-scale, more intensive farms. This area is compared to the site in an “old EU country” having the comparable agricultural, social and nature conservation character and problems. This site is located in France, in the National park “Les Ecrins”, called “Col du Lautaret”. The National Park Mala Fatra includes about 5,600 ha of grassland that have a great importance due to semi-natural and natural biotopes, hosting 71 Red List species (Galvanek et al., 2001). The more traditionally operating medium size (managing from 10 to 50 ha) and family farms (from 1 to 3 ha) manage a minority of the grassland area, but their grasslands are especially rich in biodiversity and are situated in the most difficult parts of the area (the majority of the area is managed by large cooperatives (managing from 1000 to 3000 ha). The French site is similarly unique in its botanical value of grasslands. The pastures and meadows are managed by small-scale farmers owning or renting from 20 to 50 hectares.

Over the last decades, the natural and semi-natural grasslands in both sites are under serious threat:
- the production costs are relatively high due to the mountainous character of the area. Particularly in Slovakia, costs have risen since independence due to the increased prices of farm inputs;
- the farmers are aging, there is lack of successors as the regions are socially and economically rather isolated;
- in Slovakia, the implementation of national agri-environment measures has been favouring the large-scale farms rather than the small-scale ones. At the start, the small-scale farms in both countries were quite reserved to participate in agri-environmental schemes.

Research objectives

Objective 1: Assessment of the interaction between the biodiversity status of grasslands and agro-technical and socio-economical characteristics of farmers.

Objective 2: Investigate the delivery mechanism and analyse the agri-environment measures in relation to the factors having an important role in the maintenance of grassland biodiversity.

Methods

The study is based on an analysis of the trends in agri-environment schemes in the area and the respective farm characteristics in relation to biodiversity value of grasslands. For this purpose, together 20 farmers were interviewed in Slovakia and France in April 2005 (all farmers living in the study area). Farmers covered a representative range of farms in terms of structure, agricultural production and social perception.

Factors determining the characteristics of farmers have been defined on the basis of responses from closed questions. The information concerning the agri-environment issues is obtained from conducted in-depth interviews. Factors (characteristics) were grouped into three different categories: social, economics and agro-technical. The biodiversity value of grasslands has been evaluated on the basis of data from the National Grassland Inventory (1:25 000) databases (Galvanek et al., 2001). French data on grasslands were provided by Institute of Alpine Ecology of UJF Grenoble. Firstly, we have defined the grasslands biotopes of good botanical or natural value. The biotopes have been recognised as a HNV semi-natural and natural grassland when a series of criteria have been fulfilled. The basic one is stating that the minimum 25% of vascular plant species from a group of characteristic species defined for a certain biotope were present in a mapped polygon (grassland). Several types of biotopes could be determined for one polygon. In order to define the biodiversity value of HNV, a number of species per polygon of natural and semi-natural grasslands was calculated. The minimum threshold is adapted to the surface unit. We have selected the areas of high species richness, and
based on this, we calculated the biodiversity value for each farm. This value reflects the share of grassland (in percentage) of high species richness in the total grassland area on farm. The correlation between farm characteristics and biodiversity value has been analysed by Positive Component Analysis in the statistical programme CANOCO.

Results

The study investigates the grassland biodiversity in relation to farm characteristics that are grouped into three domains: social, agro-technical and economic. As economic data provided by farmers are not precise and coherent enough, they are not included in the final analysis. However, social, agro-technical and farm management data should provide us with a picture of farm types that have the most positive impact on grassland diversity and allow us to evaluate the efficiency and targeting of A-E schemes on the farms involved.

The graph below shows a positive correlation between the characteristics of family and medium-sized farms and the biodiversity value of their grasslands. This indicates that small and medium-scale farms apply farming methods that result in high species rich grasslands. Also management history plays an important role, as grasslands of small-scale farms were not intensified in the past. Qualitative analysis shows that small-scale farmers, in both French and Slovak sites, applied extensive agricultural practices that include low livestock density, local or traditional breeds and mowing by hand. Contrary, large-scale farms in NP Mala Fatra seem to have a more negative impact on grassland diversity, as they have a much lower percentage of species-rich grassland. However, in total, large-scale farms in NP Mala Fatra still manage the majority of the HNV grasslands in the national park.

The positive correlation between grassland biodiversity and certain farm characteristics can be summarised as follows.

Family farms, typical for Mala Fatra in Slovakia, manage the grasslands in the sub-mountain and mountain zone, located closely around the farm. Each family farm manages from one to three hectares of privately owned or rented land. Family farms are small-scale, are established many years ago (up to 100 years), are predominantly privately owned and usually do not benefit any subsidies. Typically, each farm consists of a house, outbuildings and very limited technical equipment. Organic manures are used on meadows and pesticides are very seldom needed. On most family farms, one or two cattle are kept, or a small flock of sheep or goats are grazed on pastures around the farm. Much of the grasslands managed by family farms are hand-mown and hay crops are often taken for winter fodder. An important problem is the aging of farmers that have no successor. All of them have a full-time or part-time job outside the farm. This type of farmers is typical for Slovakia.

Medium-size farmers, the most common in both French and Slovak study area, manage a relatively large and complex area of semi-natural grasslands in the sub-mountain and mountain zones, reaching up to the ridge. The characteristics of these farmers showed the highest correlation with grassland diversity! Medium size farms are associated with agricultural land privately owned or rented land. Agricultural production represents a considerable part of the farm revenues. However, the majority of the farmers have an off-farm income, such as pension or part-time job. Contrary to farmers in Mala Fatra who are self-sufficient in terms of technical equipment, French farmers are motivated for regrouping or commonly owned machinery. Typically for both sites, grasslands are grazed or mowed with sheep grazing afterwards. Flock size is ranking from 20 up to 90 pieces.
Family and medium size farmers admire nature more as a symbol of tradition, in Slovakia also national identification, and aesthetic value related to beautiful landscape. Even they do not have detailed knowledge about ecology, they know that their work is important for stability in nature. Often, these farmers have a specific contract with the Nature Conservation for abandoned or less profitable grasslands of high nature value. The farmer’s nature perception in the National Park Mala Fatra and Col du Lautaret could be categorised according to the definition of Miéville-Ott, (Miéville-Ott, 2001; Miéville-Ott, 2002). The medium-size farmers and family farms seem to have a perception of “admired nature”, implementing more diverse and extensive farming practices and being interested in long term effects. The “awe-inspired nature attitude” is associated with traditional small-scale farmers who have a specific idea about management of their properties and whose message is “keep it clean and preserve” rather than “produce”. The large cooperative farms are characterised by an “ignored nature” relationship. They concentrate first and foremost on intensive practices and work according to a clear cost-profit calculation. Even big cooperatives showed very low interest in nature protection issues or application of extensive practices, although they are the major beneficiaries of the agri-environment programme. Contrary, small-scale farmers put priority to landscape values and traditional farming, but they stay quite reserved to AE schemes or were even not informed on their existence.

Discussion

1. The study identifies grasslands associated with characteristic biotopes and high species diversity. Those grasslands associated with high species and habitat diversity, or featuring species of European conservational concern, are termed ‘High Nature Value (HNV) farming areas’ (Andersen et al., 2003). This study proposes an approach for identification and evaluation of High Nature Value areas on grassland farmland. Methods proposed in this study require detailed botanic data from National grassland Inventories that are not always available.
2. The study indicated an important role of family and medium-size farms and related farm
caracteristics that are in positive correlation with high grassland biodiversity. Characteristics include
agricultural practices that are recognised as extensive or low intensity ones. This confirms that low
intensity systems have certain inherent characteristics that tend to create conditions favouring a larger
range of species than intensive systems typically support (Beaufoy et al., 1994). These characteristics
of low intensity farming systems refer to some proposed by Beaufoy et al. (1994):

- Management practices respect carrying capacity of the land and make use of the available
  natural resources without depleting them.
- Very limited use of fertilisers and agrochemicals (use is virtually non-existing)
- Low stocking densities vary according to local conditions.
- Dominated by traditional breeds adapted to the local environment.
- The majority of grazing systems are associated with meadow management, such as
  haymaking, ridding pastures of bushes, etc.

3. The study supports the earlier finding that agriculture practices reveal a system of social and
symbolic representation notably that are the foundation of the relationship with nature (Miéville-Ott,
2001; Miéville-Ott, 2002). Surprisingly, medium-size and family farmers having a positive nature
perception are less interested in agri-environment schemes then large farms. Small scale farmers are
afraid to be limited in management practices and they are convinced to manage their land in harmony
with nature.

4. Agri-environment schemes are based on compensation mechanism with payments on the area. As
the demanding administrative procedure is the same for all types of farmers and payments and does
not recognise special schemes for HNV areas, AE schemes seems to be much less attractive for
small scale farmers in protected areas. As agri-environment schemes in Slovakia are designed on national
level, they are insufficiently adapted to regional conditions. Therefore, the agricultural practices proposed to
small scale farmers for compensations are not always suitable for the grassland management and the farmers
are afraid of restrictions in farm management. A good example of implementation of regional requirements
into AE scheme is French “Environmental Territorial Contract” (finished in 2004) that provided more
competencies to regions in designation of AE measures. Schemes offering divers options of
agricultural practices for farmers were also appreciated by nature conservationists. As well
administrative procedure was simplified for farmers through option for collective contract that was
available for group of farmers.

5. The statistical analysis is handicapped by the low number of respondents. Although all active
farmers in the studied valleys have been interviewed, they represent still a small statistical group of
respondents. Therefore, the ambition of this study is not to prove evidence, but to indicate some
interesting correlations between species-rich grasslands and farm features that should be further
examined.

Conclusions

The medium-size individual farms manage on their farmland the highest portion of species-rich HNV
grasslands. In particular in Slovakia, these farmers are very important for the protection of unique
meadows of high biodiversity. Apart from this, farmers are able to combine important objectives such
as nature protection, agricultural production and rural development. Medium farmers implement low-
intensity farming practices and make benefit from more diverse non-farming activities on their farm.
Medium-size farmers are typical for both Slovak and French mountains areas.

The agri-environment scheme offers new opportunities, but small-scale farmers are still reluctant.
Administrative procedures are perceived to be complex and agricultural practices are not adapted to
local conditions. Information is not adequate and farmers mostly rely on other farmer’s opinion. The
Slovak Rural Development Plan still puts (financial) emphasis on enhancing ‘conventional’ farming,
resp. primary production. As a result, large-scale production-oriented farms still receive most of the
subsidies. The importance of HNV farming is still not fully recognised.

Recommendations

To prevent the HNV grassland from further decline, the following steps are recommended:

1. In an EU context:
- incentives for the conservation of farmland biodiversity should be better integrated in Pillar 1 payments (income support) and in other Axes (1 and 3) of the Pillar 2 rural development support;
- the payment system should change from a compensation mechanism to positively rewarding ‘green services’ to society,
- the Mala Fatra example clearly shows that the current support system, even after the recent reform, still encourages primary production and discourages conservation activities.

2. The Slovakian government has important opportunities to improve the effectiveness of agri-environmental schemes in favour of HNV grasslands. The latter could take place in the following way:
- by careful designation of HNV areas according to the national grassland inventory;
- by targeting the designation of grassland management measures under agri-environmental schemes more selectively to HNV grasslands;
- by targeting the agri-environmental payment conditions to a more active conservation of the area involved;
- by designing regionally targeted management packages under the Slovakian agri-environment scheme, thus moving from a horizontal to a (partly) territorial scheme;
- by targeting these packages selectively to HNV areas or Natura 2000 areas, this creating a better integration between the agri-environment programme and the implementation of Natura 2000;

3. There is an urgent need for ‘accompanying’ measures to increase the participation in the agri-environment programme, especially of small-scale farms. These include:
- improved dissemination of scheme information and a strengthened information infrastructure (stronger role of local offices);
- improved and free-of-charge guidance of interested farms;
- simplified, less time-consuming administrative procedures, including introduction of the possibility of collective applications (for groups of farmers or other land users).

Summary

Example of the National Park Mala Fatra shows important role of medium size and family farms in maintenance of high biodiversity of grasslands. In particular, the medium-size individual farms manage on their farmland the highest portion of species-rich HNV grasslands. Moreover, these farmers are relatively flexible and show interest to find compromise among nature protection, agricultural production and rural development objectives, in particular through implementation of low-intensity farming practices. The extent and biodiversity value of High Nature Value grasslands was evaluated on basis of data from National Grassland in Slovakia and research data in France. Case study in the NP Mala Fatra indicates that current agri-environmental schemes in Slovakia requires careful designation of HNV areas according to the national grassland inventory; more targeting the designation of grassland management measures and designing regionally targeted management packages.

References:


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