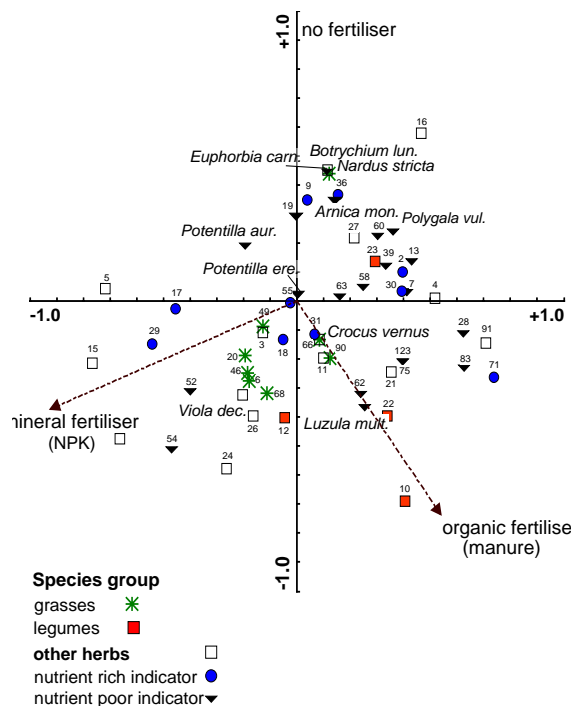


The influence of land use changes on the floristic composition of grasslands in the Apuseni Mountains, Romania

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The research presented is part of an inter- and transdisciplinary BMBF project, called „PROIECT APUSENI". The project aimed at the regional development of strategies for mountain areas in eastern Europe in participation with the local people and politicians. The study area is situated in the Apuseni Mountains in northwestern Romania. The grasslands in this region are of secondary origin, with low productivity and forage quality. The hay meadows were fertilised with manure and harvested using a scythe, following a traditional method, once or twice a year. These extensively used meadows are remarkable for their species diversity and the amount of rare plants [1]. The central aim of the grassland studies is the development of strategies and methods for sustainable management and fertilisation techniques, through interdisciplinary and participatory processes. The research field is separated into three main parts. The first part is a **situation analysis**, including the investigation of the floristic composition and yield potential of different grassland types, the description of the traditional agricultural land use techniques and the parcellary land use mapping.



Three fertiliser experiments based on a design with different intensities of mineral and organic fertiliser application were established to analyse the effects of different fertilisation regimes on yield and the botanical composition. Changes in the botanical composition can only be estimated after several years of observation. The different proportions of the plant groups in the fertilised plots for the year 2002 in Figure 1 pointed to such changes. The results from plots treated with mineral fertiliser reveal an increase in the percentage of the grasses and a decrease in the number of plants from other botanical families. The multivariate botanical analyses were carried out using CANOCO 3.12 [2].

Figure 1: Results of the redundancy analysis carried out on the vegetation réleves of the experimental variants with organic, mineral and no fertiliser on Terra rossa, *Viola declinatae-Nardetum*. Eigenvalues: 0.152 for the first and 0.100 for the second Axis.

The second part of the study deals with the **identification of indicators and the evaluation** of grassland use in terms of nature conservation and economics. The value to nature conservation was based upon the criteria of naturalness/hemeroby, and of

rareness/ endangerment. Important economic indicators are the site related yield potential of the different grassland types and the working time. Additionally, the suitability of agricultural use to specific sites is evaluated and mapped.

The results of the situation analysis and the evaluation lay the foundation for the creation of **model based scenarios** relating to the future development alternatives for mountain grassland under varying economic and political conditions and constraints. This modelling process is an element of an intergraded landscape model, developed in interdisciplinary cooperation and being applied in the overall project context. For the evaluation of the different scenario results, a set of ten economic and ecological indicators are depicted as an amoeba diagram, which is a multidimensional graph representation of the interaction between humans and environment. [1].

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