OLIGOTROPHIC GRASSLANDS AND THEIR CONTEXT IN INTENSIFICATION

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Abstract

The concept of sustainability applied to agriculture developed mainly as a result of growing awareness of negative impacts of intensive farming systems on the environment and the quality of life of rural and neighboring communities. For grassland systems, a combination of intensively and extensively management plots may give more favorable overall results than the management of the whole area at a medium intensity. The reduction of fertilizing and soil cultivation intensity led to a general reduction of environmental impacts, while the ban of certain classes of pesticides reduced eco-toxicity potentials and increased biodiversity potentials, while leading to a higher energy demand and higher nutrient losses per product unit.

Key words: biodiversity, environment, intensification, oligotrophic grasslands.

Any mountain region should be subject to planning policies and spatial development that does not diverted from their core vocation of agriculture, animal husbandry, as the engine of sustainable rural development, forestry, handicrafts, cottage industry, and tourism, with an emphasis on quality and added value that does not affect the environment. In the mountains, technologies to increase productivity in livestock and land use are limited by climatic factors and the requirements of organic resistance to natural factors (Rey R., 2008).

The changes caused by different modes of land use in mountain areas increasingly show vulnerability and fragility of these ecosystems (Eea, 2010). The two extreme modes of use: intensification and abandonment related to climate change more sharply from year to year induce radical changes in the biodiversity of mountain ecosystems. Mountain meadows are very sensitive to reduced use, mowing systematically (eg) while maintaining high species diversity. On the other hand, the pace of intensification areas with high productivity is similar to the rate of abandonment of areas with low production potential, and the effect on biodiversity is again similar. In intensity areas, biodiversity are reduced to productive species, while abandoning creates an opportunity for installing wood species (Eea, 2010). For example, it was estimated by European Environment Agency in 2005 that during the 20th century, semi-natural habitats decreased by over 90% in most parts of Europe with the consequence of such a bias. IRENA indicator 33 (Impact on habitat types and biodiversity) showed that "80% of all main areas of EU-15 butterflies, suffer a negative impact from intensification, abandonment, or both. Among agricultural areas, 43% suffering from intensification, while abandonment is a significant problem in a proportion of 47%. Both of these effects occurring simultaneously in 10% of cases. By 2050, a quarter of all species on Earth could be in danger of extinction (http://www.livescience.com/4056-quarter-species-2050.html).

MATERIAL AND METHOD

Climate change is beginning to affect biodiversity and how it is expected will cause a significant loss of biodiversity in the near future (Thomas A. et al, 2004 Pearson R.G. et al, 2002). European Union (EU) has pledged to halt biodiversity loss by 2010 (Unece, 2003). To assess whether this objective can be achieved EU decided to implement a set of indicators that describe different aspects of biodiversity:

a) "Measuring Trends biomes, ecosystems and habitats"

b) "Trends in abundance and distribution of selected species"

c) "Change in status of threatened species (Red List indicator under development)"

d) "Trends in genetic diversity of domesticated animals, cultivated plants, and fish species of great socioeconomic importance" and

e) "Coverage of protected areas".

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Verbom *et al.*, 2007, shows only the first indicators and trying to make a movie about biodiversity by the year 2030 Eururalis scenarios. Westhoek *et al.,* 2006 used in that study are divided into two dimensions: government weak (A) to ambitious government (B) and globalization (1) to regionalization (2). Taking these dimensions lead to four scenarios: the world economy (A1), continental markets (A2) global cooperation (B1), and regional communities (B2).

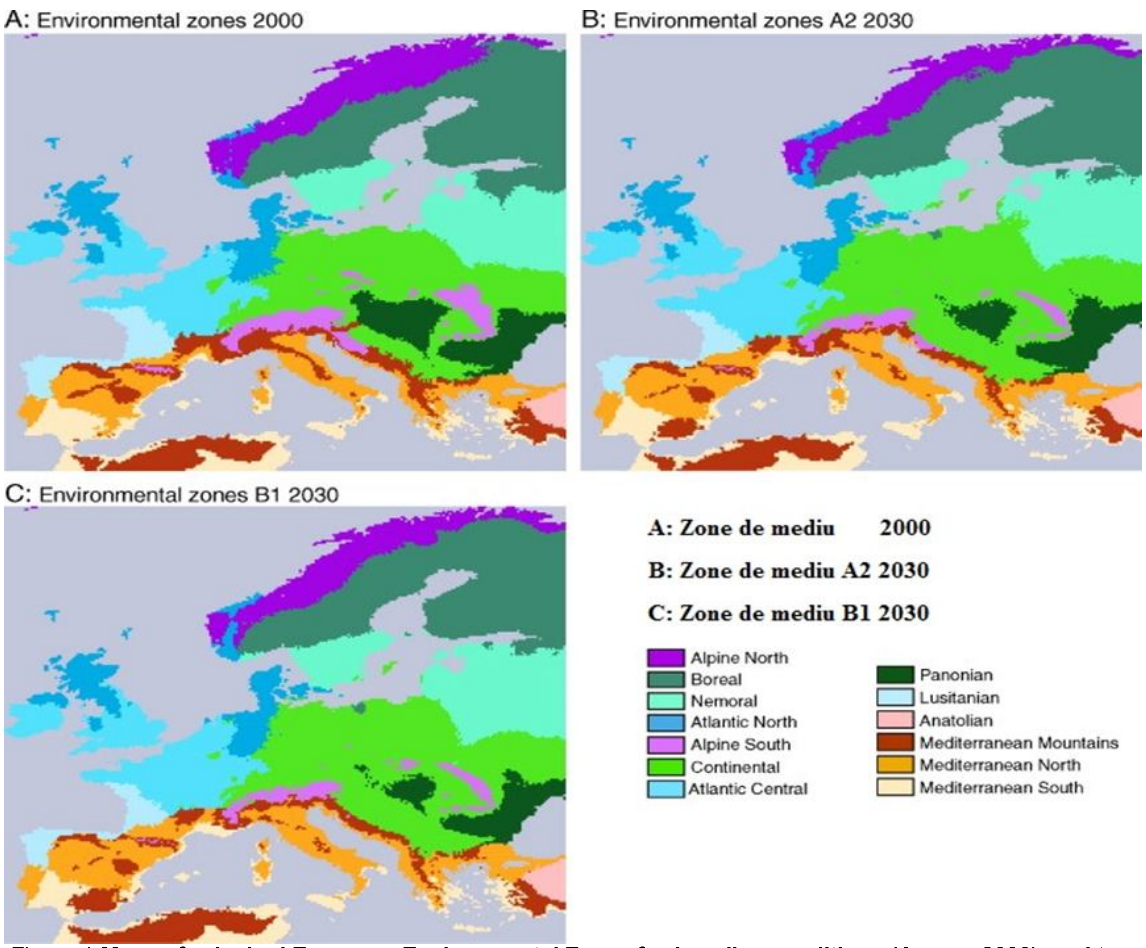

Figure 1 **Maps of principal European Environmental Zones for baseline conditions (A: year 2000), and two alternative scenarios for 2030; A2 (Continental Market) scenario (B) and B1 (Global Cooperation) scenario (C).**

REZULTS AND DISCUSSIONS

Forest / nature / physics class grasslands differ considerably in the European, both in species composition and species richness (Verbom J. et al*,* 2007). Therefore, it was decided to combine classes of land use environments of major European Environmental Stratification of Europe, which is based on statistical group climate variables (Metzer M.J. et al, 2005).

For the present study was considered the most appropriate zoning, for example, the boreal, alpine area, the Pannonia plain, as described in Figure 1.5 division. To incorporate the effects of climate change, climate response functions were calculated for each layer using discriminant analysis (Metzger M.J. et al, 2005). This analysis shows that in the second half of the 21st century Europe is likely to experience major environmental changes. Environments evolve southern north. In addition, there are large reductions in South Alpine and Mediterranean and mountain area (-53% reductions averaged -30%), which represents over 16 climate change scenarios. Large increases will occur in the Mediterranean North and South. Atlantic areas remain relatively stable because of tampering by the Atlantic climate (Metzger M.J. et al, 2005).

In the debate on climate change caused by global warming, lawns were classified as an important carbon sink by storing it in greater quantity in comparison with arable land (Ipcc, 2000). Moreover, the meadows are a characteristic element of the European cultural landscape, playing an important role in maintaining semi-natural habitats, using traditional agricultural practices vital for biodiversity protection (BriemleG., 1999; Zdanowicz A., 2005).

According to Roggero P.P. et al, 1996, Mediterranean rearing systems can be regarded as sustainable when characterized by the following conditions: organization and planning of the local resources and their renewal; use of biodiversity and diversification of resources; integration of multiple uses; adaptation and development of security devices. In general, nutrient losses from extensive farming systems of southern Europe are low if compared to Central and North European countries.

Another factor affecting Mediterranean oligotrophic grassland system in the last decades is the EU agricultural policy. The subsidy per ha or per reared head have played a great role in the choice of the crops, animal stocking rates and management.

This tended in many cases to promote the maximization of subsidies income per farm (e.g. increasing the number of animals) in strong contrast with other aims, on which sustainability is based, and with negative cultural, social and environmental consequences.

Moreover, it is becoming widely accepted that agriculture is just one of several rural land use functions. Farmers have already been recognized, and in some case compensated, for their role of guardians of the environment.

Therefore they are more and more engaged in undertaking a series of functions related to the so called 'agriculture for services', aimed the production of non-food goods and environmental externalities (Porqueddu C. et al, 2003).

Many of the most valued landscapes and rare habitats of Europe is the product of low intensive livestock production systems. In thousands of years very strong relationships were established between animals and grass- or rangelands under traditional extensive farming systems (e.g. Mediterranean agro-silvo-pastoral systems). The preservation of the traditional landscape, its quality and the large-scale equilibrium at the territorial level are of great importance.

CONCLUSIONS

A combination of intensive and extensive management may be more eco-efficient than a management at medium intensity of the whole area.

The reduction of fertilizing and soil cultivation intensity led to a general reduction of environmental impacts, while the ban of certain classes of pesticides reduced ecotoxicity potentials and increased biodiversity potentials, while leading to a higher energy demand and higher nutrient losses.

AKNOLEDGEMENTS

This paper was published under the frame of European Social Fund, Human Resources Development Operational Programme 2007-2013, project no. POSDRU/159/1.5/S/132765.

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