Biodiversity and Transition Pathways to Sustainable Agriculture: Implications for Interdisciplinary Research in the Carpathian Mountains

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ABSTRACT

Traditional farming in the Carpathian Mountains is accompanied by a high degree of biodiversity, nice landscape appearance, and amenities appreciated by citizens. It is based on traditional knowledge which is deeply embedded in the peasant culture of the local population as well as on the labour-intensive operations and traditional technologies like hand mowing and weeding, cropping of small fields, rotation recognition of tuber crops, etc. which are all prerequisites for good ecology. So, on the one hand we can assume that the traditional, high nature value farming system in the Carpathians has been reached by evolution and a rather high degree of relatedness or connectivity between local economic activities and biodiversity exists. But on the other hand there are many problems which put this situation under threat. This farming system is labour intensive and subsistence oriented, which results in relatively low standards of living and lack of future perspectives for younger generations. As a consequence there are and will be driving forces which will change land use in this remote area. Typical processes that can be expected are either modernization, farm growth, landscape deterioration and loss of biodiversity like in other mountainous areas (Switzerland, Austria, Norway, etc.) or abandonment of farming and settlement and forest growth (France, Spain, Italy, etc.). In any case, the still prevalent, typical biodiversity is under threat. The peculiar situation in the Carpathian mountains gives very good opportunities for in depth research on scenarios and alternative developments. This paper describes a proposed interdisciplinary project to investigate future options for the region.

INTRODUCTION

For the Carpathian Mountain areas in both Romania and Ukraine, processes like modernization and abandonment of land can already be observed. Especially in the Ukrainian part of the Mountains young people are leaving the area and bush encroachment is a typical phenomena. In Romania due to financial assistance of the EU there is a mood for modernization. This mood will most likely open a pathway for intensification, specialization and mechanization as has been typical for Western Europe; at least in some areas. However, the still prevalent, typical biodiversity is under threat.

The current state of farming and the farming system in the Carpathians is in a peculiar situation: on the one hand there is much speculation about reintroduction of sustainable farming, which in essence means high nature value farming; on the other hand the existing high nature value farming of the Carpathians is under threat of disappearance, because it is no longer conducive for a socio-economic background given by the system change. It seems to be self-evident that conservation of the traditional farming system would have a positive impact on the ecology. But going into detail many problems appear.

For instance, traditional farming is a labour-intensive operation, and labour-intense farming which implies hand mowing and weeding, cropping of small fields, rotation recognition of tuber crops, and seasonal labour, etc. is a prerequisite for a desirable ecology. Furthermore, low
sales potentials and other problems (including bad access to roads and markets) impede market integration. For instance, Romanian farmers have difficulties with milk hygiene, finding local customers for cheese, meat, etc. Partly because most farmers are still subsistence farmers, local division of labor is low. This is a part of a poverty syndrome which becomes even more evident from the small size of farms. The third aspect which contributes to the peculiar situation is the socio-economic background of the local population dynamics. In the Carpathian districts which we are intending to study the majority of the population is composed of minorities. They keep a style of living which gives them not only food, shelter and income but at the same time also a cultural identity. These people try to conserve technologies because they are embedded in a peasant culture which is oriented to more factors and values than production alone. Such an aspect makes it very interesting to study because it includes driving forces for structural and landscape change.

Although both tendencies, modernization and abandonment of land, are becoming more and more distinct in the various Carpathian regions, the Carpathians are still (due to a certain remoteness) an excellent area for studying (as an on-going process) the path dependency of linkages which have been finalized in other mountain areas of Western Europe. This situation gives very good opportunities for in depth research on scenarios and alternative development options which would be possible for the region. That is why our research group composed of scientists from Germany, Romania, Ukraine and England is eager to deal with this issue and to go deeper into detail concerning the topic “Alternatives in Land Use and Livelihoods in the Carpathian Mountains: Options for Biodiversity Conservation and Rural Development”.

TEXT

Various driving forces can be considered in the dynamics of transition. There are forces which foster movements away from traditional, high nature value farming (Beaufoy, EFNCP) and others which foster conservation. Note that we do not have a normative view that conservation is good and modernization is bad. Rather the project aims at finding a new way of amalgamating traditional ways of farming with new options for economically sustainable high nature value farming. The major question is whether this process of finding new solutions is purely driven by uncontrolled forces or can be moderated. For a certain time impediments like the danger or awareness of losing cultural identity, which preserved traditional farming so far, may work; but our hypothesis is that they will lose strength.

It is interesting to follow the notion that modernization will be a process that is unavoidable or even unmodifiable and that the loss of biodiversity is the price to be paid for modernization. We deny that, and take the position that moderating changes of the traditional farming system could be beneficial to farmers and would not harm the environment too much.

Apparently, that is a qualitative perspective and the real options are much more difficult to define. However, the underlying question is: what is the conducive, “institutional” framework in which driving forces can operate?

To research the question of promoting an, at least, semi-traditional, though still high nature value farming, a reference to alternative developments and scenarios has to be found, constructed and evaluated. Gaining insight through scenarios allows us to detect triggers by which we might redirect a development which is not sustainable. Here we do want to do in depth research on alternatives. That is why the issue of land use alternatives is in the middle of our project structure (Fig. 1). The central question is: are there underlying driving forces in a multilayer concept of driving forces? And what are the fundamental elements that control these forces?

It is a core hypothesis of this project that institutional regulations can play a major role in directing developments. Among institutional alternatives which need to be designed we identify self-governance as most promising. Local self-governance addresses the needs of the communities that live in the mountains and may open a new round of recognition and valuation of biodiversity. In contrast, the usual perspective is that development aid which comes from outside can trigger poverty reduction and stimulate rural development, notably as it is done in the EU frameworks which are currently adopted in Romania. Our perspective is that these projects, which still aim at increase of labour productivity as the main trigger but
within the framework of nature conservation, are not resulting in provision of high nature value farming. Also knowing that there are presumed causalities underlying the increase of labour productivity, such as giving up farms and rural unemployment, change can only be obtained through farm consolidation, mechanization and, for instance, increase of dairy herds, etc. It becomes questionable whether this is the pathway which should be suggested (from a normative perspective) as it is done currently in Romania. In Ukraine we perceive similar thoughts and wishes; though there is scarce aid for rural development.

Since very few young rural dwellers see opportunities in both countries, labour intensive agriculture is limited to subsistence of the elderly, having a maximum of two cows, two pigs, some sheep, a small potato field, etc. for subsistence; but it is a subsistence which is losing its basic resource which is labour. The maintenance of pastures and meadows is under threat.

So we have to look at other avenues to promote well-being of farmers and conservation of nature in the context of existing threats, external driving forces and poverty. These avenues should contain a strong vision for the local common good: biodiversity; i.e. the prevailing biodiversity and cultural landscape are to be considered community assets and are fundamental for environmental sustainability.

From the perspective of a market economy the immediate question is: how can one market the high nature value, pertinent to the area. An immediate idea is tourism. It seems that agro-tourism has gained much interest in marketing high nature value agriculture. However, it needs a special design, management and careful advertising. From observation on success stories of high nature value agriculture it can be concluded, that medium sized rural enterprises are gaining most from agro-tourism; this has been especially proved in Italy. A major issue is how communities of subsistence farmers can adapt to agro-tourism. Furthermore we have to recognize the social impacts of money retention by some farmers and ask what tensions this creates in rural communities. It is important to mention that agro-tourism is also part of marketing local products etc. Hence a question is which products (honey, wild fruits, timber, handicrafts, etc.) have potential and what impact marketing them has on the regeneration of species. For instance, a special case is arnica as a herb for traditional medicine and others.

Again, the perspective of biodiversity, species conservation, and using of wild fruits, herbs and mushrooms brings in a special moment of community production in the common land (forest, special meadows, etc.). This is missing in many development concepts. But the quantity and quality of extraction of species must be controlled by the community.

If we want to create an interest of the local people in biodiversity we need to specify what they think, what they have in common and how they can derive utility from their resources. For instance, fishing, collection of fruits, honey, etc. contributes also to a diverse local diet. However this has to be balanced with labour costs. Labour costs in peasant communities are not the same as in a market economy since we have to add significant unpaid efforts. And above effort the issue of housing costs, quality of infrastructure, etc. has to be put into perspective. Infrastructure can be locally financed. With increased deductions from salaries the advantage of migration is reduced. Nevertheless a big issue is life and comfort improvements. A matter to be investigated is the scope to create local goods which provide alternatives to “imported” goods. In this respect an important aspect to be studied is the local transport net. Biodiversity and local infrastructure are two aspects which are connected through threats (pull) and opportunities (push). However, many aspects are unclear such as: will increased access to areas by road building impose more stress (can we conserve areas through isolation) or will it raise opportunities for a “modernized” marketing of local resources. This needs insight and experiments.

There are many counter hypotheses and the Carpathian Mountains are, because of their continuing remoteness, an excellent area for studying the path dependency of process of “modernization” which has been finalized in mountain areas of Western Europe (West Alps, Piedmont, Italy as areas with currently very low population density and East Alps, Tyrol, Austria with areas of well-developed tourist activities) (Durand, Van Huylensbroeck, 2003).
Taking the connectivity of local goods and regional biodiversity as a core research objective of the project, we have to find instruments which increase the relatedness or connectivity between local economic activities and biodiversity. We start with the hypothesis that the traditional, high nature value farming system of the Carpathian Mountains has reached a rather high degree of relatedness between ecology and economy. The aim is now to avoid a strong decline in relatedness and try to develop a relatedness which fits into future needs of the population and makes nature recognition an incentive scheme.

![Project structure](image)

Figure 1: Project structure (negative feedback loops, positive feedback loops, linkages which characterize the interconnections with the scenario building level).

Relatedness can be constructed like a multiplier analysis in social accounting matrices. In economic analyses for instance, relatedness as multipliers is measuring the impact of increased revenues of local producers on the expenditure on local commodities. We revise the word commodities and ask for local ecosystem services. The major research question is how gains from ecosystem services which are based on a diverse environment can be connected to investments in the ecosystem or how we can avoid de-investment in ecosystem services due to exploitation and modernization. We will develop a uniform measure on these processes which will allow us to compare communities on the basis of relatedness of economic and ecological processes. A disaster would be a completely decoupled relationship between ecology and economy. As an example of decoupling we can perceive a greenhouse landscape as in the Netherlands, which might be described as economically successful but we can hardly perceive the greenhouse landscape as an ecologically sustainable multifunctional landscape providing all types of ecosystem services.

However, the secondary objective is to look at instruments which amplify the local ecological and economic relatedness, i.e., technically to look at institutions which maximize the multipliers. Institutions (in economic terms, or government regulations in vernacular terms) are particularly important for getting local economies to work.

The intended interdisciplinary project implies a certain structure, which reflects the complexity of the relationships within the considered system (Fig. 1). The structure has three levels with a certain number of elements (variable) and it allows us to identify two types of feedback loops: causal and control. As already mentioned, the scenario building level is at the centre of the project. This level is connected to the organizational structures, which create the frameworks for the functioning of other levels, and to the local level of action, which is directly connected to the regional system. The sub-levels are interconnected through the system of positive and negative feedback loops characterizing the type of the society (community oriented in case of positive feedback and disconnected society in case of negative feedback).
which is going to synthesize the various alternatives possible at different interdisciplinary sublevels.

CONCLUSIONS

Taking into consideration the complexity of the main research questions, an interdisciplinary project is the most promising option for the study of the pathways to sustainable agriculture in the Carpathians. Hence the project has the following main objectives: First of all it aims at finding a new way of amalgamating traditional ways of farming with new options for high nature value farming. We believe that moderate changes of the traditional farming system could be beneficial and would not harm the environment too much.

In order to find pathways for this process, it is important to study driving forces for structural and landscape change, to detect triggers which might redirect developments which are not sustainable, and to find instruments which increase the relatedness or connectivity between economic activity and biodiversity. The major research question in this respect is how gains from ecosystem services which are based on a diverse environment can be connected to investments in the ecosystem.

Another aim is to investigate the institutional environment supportive of high nature value agriculture, and the possibilities for the localized economy to direct developments. It is important to find alternatives in the form of local solutions which would not be dependent on outside aid only. The most important questions in this respect are:

- What role does agro-tourism play in marketing high nature value agriculture?
- What local products have potential in the market and what impact would they have on local biodiversity?
- What is the scope to create local goods as an alternative to “imported” goods?
- How should the community manage and control production in the common land (forests, communal meadows, pastures etc.)?

Among institutional alternatives which need to be “designed” and tested it should be possible to identify some with a strong self-governance as we think this is most promising. The research on these alternatives may help to detect possibilities to invent incentive schemes for local populations to maintain the local biodiversity while enabling a transition from a traditional farming (which is environmentally sustainable) to farming which is sustainable ecologically, economically and culturally in a globalised economy.

REFERENCES

