

## **The potential impact of greening as a directed land use on the landscape structure**

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### **Introduction**

The intensification of agricultural landscapes significantly sped up in the 20th century. The European Union created the Common Agricultural Policy (CAP) with the objective of securing the productivity, the biodiversity and the ecological stability of agricultural landscapes. A new measure in the 2014 CAP Reform is “greening”. Its goal is to support agricultural activities which are beneficial to the climate and environment as well as to protect landscape elements which are important for ecosystems. The impact of this measure on the landscape structure is unpredictable.

In this study, we compare the earlier legislation to the current greening provisions in order to confirm whether the new measure is a step forward in maintaining biodiversity. Afterwards, we examine the greening process of an agriculture-dominated sample area in Hungary, and we draw conclusions regarding the events in the first half year of greening.

### **Background/Literature Review**

Through the reform of the Common Agricultural Policy (CAP), the member states of the European Union have to use 30% of the agricultural aid for environmental goals in 2014–2020. This action is called “greening”. The main objective is to protect the quality of the water and soil, as well as to protect the biodiversity and the rural landscapes. Some of the long-term objectives are to mitigate climate change and to adapt our agriculture to it (eea.europe).

In the greening procedure starting in 2015, the farmers have to meet the requirements in three various aspects to receive the support. These are: (1) maintaining permanent grasslands, (2) crop diversification, and (3) dedicating 5% of arable lands to 'ecologically beneficial elements' ('ecological focus areas', or EFAs in short) (Ministry of Agriculture of Hungary, resolution No. 10 of 2015 (III. 13.)). MePAR is a Hungarian land parcel identification system which helps fulfilling the obligations and commitments of the Hungarian farmers. MePAR is the exclusive national system used in subsidy proceedings (Ministry of Agriculture of Hungary, resolution No. 71 of 2015 (XI. 3.)). On the MePAR website, farmers can search for their lands, and get further data on

them thanks to the rich GIS database. In the end of 2015, the database has been expanded with landscape elements defined in greening, thus farmers can see what they can account as EFA. EFAs can be land lying fallows, terraces, landscape features, buffer strips, agro-forestry areas, strips of eligible hectares along forest edges, areas with short rotation coppice, afforested areas, areas with catch crops or green cover, areas with nitrogen-fixing crops (Kovács et al., 2015). The vulnerability of landscape elements has increased since the MePAR and greening regulations entered into force. This is because data transfer from the existing databases took place with reduced data content – that is, not every element has been transferred, and not by their real extent.

Designating the EFAs should not be a problem for farmers, because according to the mutual cross-compliance, the protection of these landscape features is a legal obligation (Ministry of Agriculture and Rural Development of Hungary, resolution No. 81 of 2009 (VII. 10.)). It is sometimes debated that from this year onwards, the farmers receive financial support for an activity which is an obligation anyway, without real steps taken in order to sustain biodiversity (Matthews, 2015). The permanent grasslands and crop diversification are likely to be significant for the mosaic landscape structure. Protecting and designating EFAs could bring significant changes in the ecological and biotope network. Land use creates a fragmented landscape composed by natural mosaics and man-made patches, where connectivity is not ensured in all cases (Turner et al., 2001). However, inappropriately designating these areas could be especially harmful. According to more and more ill-omened forecasts, greening actually has a worsening effect regarding the mitigation of climate change, as farmers will try to compensate the profit loss originating from the “obligatory” extensive agriculture by intensifying the cultivation of other areas, or in extreme cases by cultivating new areas.

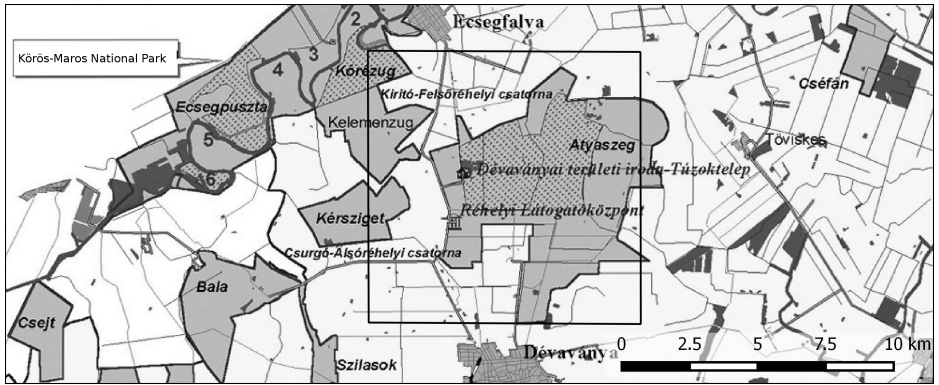
Traditional ecological knowledge is *“a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmissions, about the relationship of living beings (including humans) with one another and with their environment”*. *“Traditional ecological knowledge is a way of knowing; it is dynamic, building on experience and adapting to changes.”* (Berkes, 2012). The significance of the traditional ecological knowledge (TEK) has increased in the last few years. The application of TEK to the agri-environmental programme could put profit-oriented agriculture on a sustainable track (Molnár, 2014).

## Goals and objectives

The goal of this study is to highlight the potential dangers of greening. The Hungarian legislation strictly limits the subsidisable elements. Although sustaining natural field margins and ecological corridors had been defined as a goal, their preservation is not secured. Our aim is to highlight the dangers of over-regulation, and the importance of traditional ecological knowledge.

## Method(s)

We mapped three grades of greening in the selected sample area using GIS tools. The 10km×10km sample area belongs to Körös-Maros National Park (Figure 1).



**Figure 1.** The examined area, where highly protected areas are grey

Figure 3a shows the state before greening was introduced. The agri-environmental management legislation on high natural value areas prescribe extensive agriculture with a conservationist approach. The dark areas in Figure 3a are the specially protected saline grasslands. They appear as “floating islands” in the landscape, and creating their interconnectivity is not prescribed by any legislations.

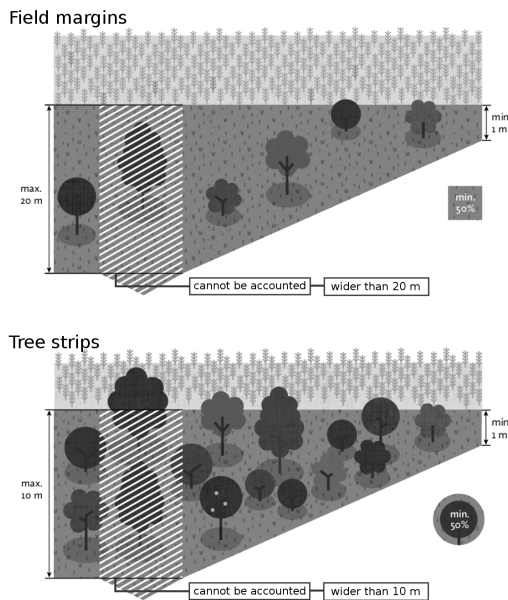
Figure 3b shows also those landscape elements which are available in MePAR, therefore farmers can see and account for them. In addition to the specially protected grasslands of Figure 3a, Figure 3b also shows permanent sensitive and insensitive grasslands, buffer strips, groups of trees and bushes, solitary trees, shadoofs, tumuli, and their buffer zones.

Figure 3c further adds allees and field margins. Figure 3c uses MePAR block edges. Mapping is not possible on the legislation’s level of detail without having access to the property sheets of the farmers. It can be stated however

that if all owners of areas larger than 15 hectares would use the possibility of creating margins, a much more interconnected network could be created.

## Results

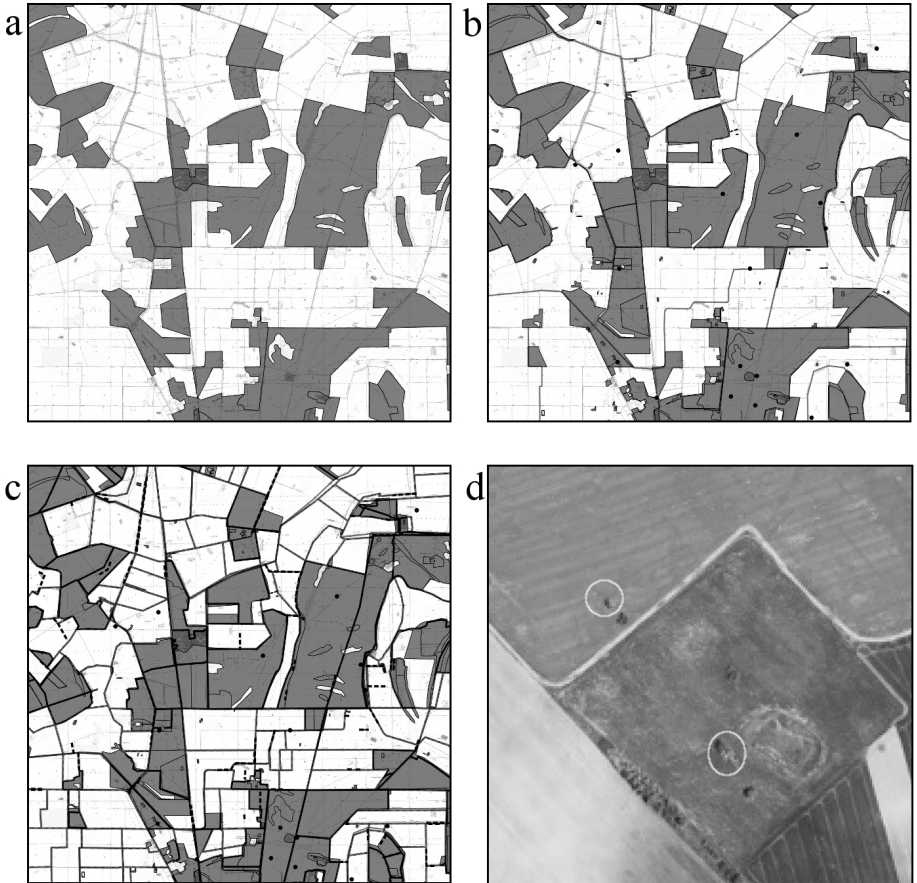
By comparing the earlier legislation to the greening provision, it can be concluded that the landscape elements suggested for protection in either regulation strongly overlap. 5 out of 9 EFA landscape elements are already protected by cross-compliance. The new landscape elements are tree strips, allees, field margins and ditches. However, their definition is overregulated, and also ambiguous in numerous cases nonetheless. According to the regulation, field margins may be a 1-20 metres wide uncultivated strip next to an arable land, if that strip is covered with herbaceous vegetation by at least 50 percent. Calculating the land cover is based on the momentary impressions of the farmers and of the controlling authorities. A 1 to 10 metres wide strip directly bordering an arable land may be accounted as tree strips if there is at least 50 percent of arboreal vegetation (Figure 2).



**Figure 2. The problem of field margins and tree strips**  
(source: Kovács et al. 2015)

It is a question whether tree strips wider than 10 metres (which thus fails to meet the legislation's definition of tree strips) can be accounted as field

margins. If there is more than 50 percent of arboreals in a tree strip wider than 10 metres, the area may be an EFA only by felling trees. This is also the case between allees and tree strips. The definition of allees is unrealistic and unverifiable. The location of missing trees in an allee cannot be accounted as EFA, but no regulations mention any possibility for planting. Therefore, it is a serious question whether the newly introduced EFA elements truly contribute to sustaining and increasing biodiversity, or are merely simple and quick tools for delivering on the EU obligations.



**Figure 3. Three stages of the realisation of greening regulations (Figure a-c), and insufficiencies in layers of the MePAR system (Figure d)**

The possible effects of greening on the selected sample area can be clearly visualised on a map. Figure 3a shows the state before greening, when only the regulations for high natural value areas applied to the farmers. The controlling authority was unable to check whether these regulations had been met, thus the extensification of the area is not progressing at the pace it should.

Figure 3b reveals EFAs defined in MePAR. According to the legislation, only those landscape elements can be accounted which appear on the thematic layers. However, as seen on Figure 3d, the content of the thematic layers is insufficient. Landscape elements circled in white are included in MePAR, and thus they can be accounted. But the aerial photo shows that trees similar to the accountable solitary trees have not been marked. Likewise, the strip with groups of trees and bushes along the field margin is not an official EFA, even though the landscape ecological role of uncultivated bounds cannot be questioned.

Figure 3c presents the possible effects of greening if not only the landscape elements in MePAR, but all defined EFA elements are taken into account. At the time of creating the figures, neither a layer with the property lines nor ownership documents were available. Therefore, we marked field margins on the edges of blocks used for subsidy proceedings. The real network of field margins could be even more interconnected.

## **Discussion and conclusion**

Greening regulations are often artificial and unrealistic. Inadequate expertise and the lack of regional complex approach can cause significant problems in the landscape structure and in the connectivity of the ecological network. The currently used definitions of certain landscape elements may be fatal. The strictly linear edges of field margins may decrease naturalness, and may result in artificial landscape appearances.

CAP provides great possibilities in the integrated communication with farmers and in defining farming principles. An analysis with a comprehensive approach should be performed on the processes so far, revealing the possible positive and negative effects. Strategies and agreements accepted by the EU member states set the goals of effective actions against the decrease of biodiversity and making rural agricultural areas more livable (Filepné et. al, 2014). The signs show that the actions deviate more and more from the plans.

The importance of traditional ecological knowledge has increased over the last few years. A key question to sustainable life is whether we will be able to reach back to our roots, can we recall the knowledge already forgotten in many

regions which enabled people to live in landscapes for centuries without causing harms to the environment. This approach can be hardly fit into the current strict agri-environmental management legislations. However, if we want to reach the goals set in the EU agreements, a realistic alternative could be to adapt traditional ecological knowledge and landscape use into the current legislations.

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