

**DILEMMAS OF AGRO-ENVIRONMENTAL MANAGEMENT FOR THE 2014-2020 PROGRAMMING PERIOD****EDIT HOYK<sup>1</sup>, JENŐ ZSOLT FARKAS<sup>2</sup>**

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**ABSTRACT**

The environmental impact of agriculture is in the focus of public and scientific interest since the 1980's. After the economic transition, because of market loss and other reasons, Hungary was characterised by reduced negative environmental effects of agriculture. However, an OECD analysis prognosticated an again growing environmental impact of agriculture in Hungary. The connections between environment and agriculture form an important part of Hungarian Rural Development Programme for the 2014-2020 programming period. The aim of this paper is to provide an analysis of the selected indices of the Hungarian agricultural sector to decide whether to prognosis of the OECD was correct.

In accordance with these results, the authors also examine to what degree the Rural Development Program in preparation can contribute to the goals of agro-environmental management, sustainable agriculture and environment protection.

**KEYWORDS:** climate change, agriculture, agro-environmental programs, rural development

**INTRODUCTION**

Environmental policy is one of the EU's horizontal policies and has to be implemented in all sectoral policies of the Member States to ensure that environmental aspects are taken into account in every sector of the economy. This particularly applies to agriculture for which unpolluted environment, clean soils, water and air are essential. This is why the environmental impact of agricultural production during the post-productivist transition is in the focus of both public and scientific interest.

The study gives an overview of the environmental impact of the Hungarian agriculture and the related challenges of climate change. These topics form an important part of both the strategic documents of the EU for the programming period 2014-2020 and the related forthcoming Hungarian Rural Development Programme 2014-2020, which also underlines the relevance of this paper.

Besides the actuality of these problems, the authors' topic choice was also heavily influenced by an OECD analysis form 2008, which prognosticated the recurrent increase of the environmental impact of the Hungarian agriculture. According to the OECD analysis, the improving financial situation of the producers, the increasing farm concentration and the growing significance of the agricultural subsidies of the EU will be the main factors behind the anticipated environmental impact growth (OECD, 2008). This prognosis comes as no surprise, considering that after the economic transition, Hungary was characterised by reduced agricultural intensity due to the market problems and changes in land ownership and farm structure. A significant drop in the use of inorganic fertilizers and pesticides affected the environment positively, but some of the consequences like the reduction of yields and soil fertility were unfavourable for the producers and the agricultural sector.

The study mainly focuses on whether the Hungarian agricultural subsidies introduced in 1998 and the EU subsidies available from 2004 induced notable changes in the environmental impact of agriculture and to what degree have the agro-environmental measures implemented since 2003 been able to neutralize it.

The authors' hypothesis is that the agro-environmental subsidies fulfil their role only partially and induce similar processes to those took place in Western Europe in the 1990s. In order to maximise their subsidies, the farmers participate in the agro-environmental programmes, but with a smaller area than it was expected, while they intensify the production in the remainder of their lands (BOWLER-ILBERY, 1998). This process magnifies the negative impact on the environment and undermines the efficiency of the measures to mitigate the effects of climate change.

## **MATERIAL AND METHOD**

The original sources of the agro-environmental and farm structure data used for the analysis are the Farm Structure Survey of 2003 and 2013, the Agro-environmental Report 2000-2010 and the Statistical Yearbook of Agriculture, 2012; collected and published by the Hungarian Central Statistical Office. Because of the limitations of this article, the authors deliberately focused on only a few of the available indices. The authors' opinion is that these chosen indices are the best to illustrate the changes in the environmental impact of agriculture.

Another important source document of the analysis was the draft version for public consultation of the Hungarian Rural Development Programme. This document will provide the framework for managing the funds of the next programming period. The fourth (restoring, preserving and enhancing ecosystems dependent on agriculture and forestry) and the fifth (promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors) priorities are concerning with the relations between agriculture and environment-protection.

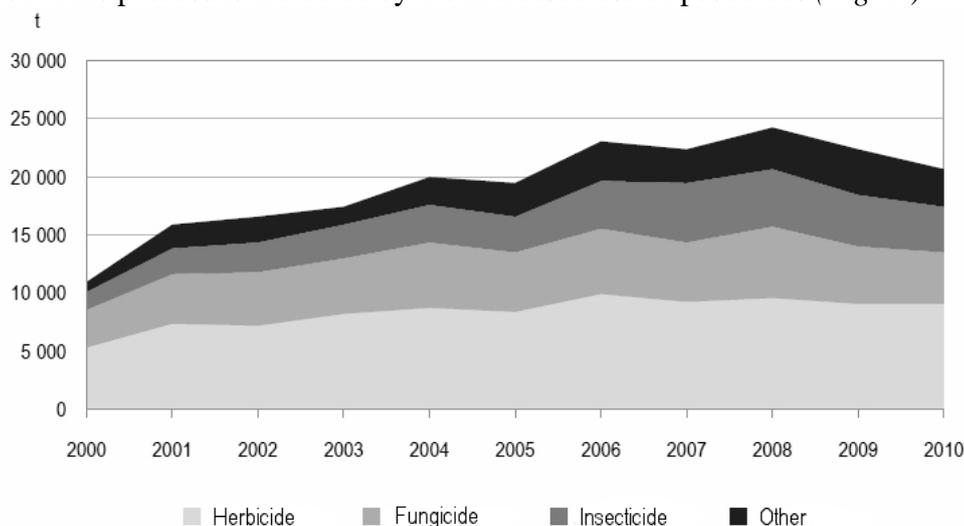
## **RESULTS**

At first, the authors examined the factors identified by the OECD (farm concentration and growing income) and their environmental impact.

In Hungary, land concentration is, without doubt, an ongoing process, although its rate varies according to the different official statistics. In 2000, there were more than 966 thousand agricultural holdings in Hungary, while the Farm Structure Survey of 2013 only found 493 thousand farms, which indicates rapid concentration. The average size of the private farms increased from 2.51 hectares to 5.4 hectares between 2000 and 2013, thus confirming the land concentration. However, the average size of the agricultural enterprises decreased from 553.49 hectares to 308 hectares in the same period. The shrinkage can be explained by the growing number of agricultural enterprises (KSH, 2004; KSH, 2014).

The land concentration is more evidently visible in the area payment data. According to the available data for Bács-Kiskun County, the average size of subsidised land per claimer grew from 13.7 hectares to 18.21 hectares between 2003 and 2006. This suggests that the reinstatement of agricultural subsidies in 1998 and later the introduction of the European subvention system to Hungary led to a significant decrease of self-sustaining social farms and an increase of market-oriented agricultural holdings. More farmers aim cost-

effectiveness (e.g. optimal farm size) to maximise profit and tend to intensify their production. This process is indicated by the increased use of pesticides (*Fig. 1.*)



**Figure 1. The amount of sold pesticides 2000-2010**

(Source: Research Institute of Agricultural Economics, KSH, 2012)

While the increase in the use of inorganic fertilisers was less apparent, Hungary was characterised by a rapid growth in the use of pesticides in the period of 2000-2007. Only years with unfavourable weather condition did not follow this trend. After 2008 the pesticide usage was dropped in relation to the economic crisis. Data from 2012 suggests that the agricultural sector is getting over the crisis and the inorganic fertiliser and pesticide use have been slowly increasing again in the last three years (KSH, 2012; KSH, 2013).

One of the possible indicators of the negative environmental effects of the aforementioned processes is the population change of birds living in agricultural habitats. Between 1999 and 2012, the population of these species decreased by more than 30 percent, with a more rapid decline after 2009-2010 (KSH, 2013). This implies amplified disturbance and the shrinkage of favourable habitats. The increase in land area included in the High Nature Value Areas programme (HNVA) is definitely a success; however it cannot balance out the overall negative effects of the agro-environmental measures. Similar tendencies can be observed in relation to the environment-friendly organic and ecological farming; with stagnation in both the number of the participants, and the included land area in the last 7 years (KSH, 2013). This clearly indicates that farmers seek to achieve market competitiveness through intensive large-scale agricultural production, and the programmes created to counterbalance it are not appealing enough because of different economic and bureaucratic reasons. The authors' opinion is that these processes are similar to those that took place in Western Europe in the 1990s, at the launch of agro-environmental programmes.

Another environmental problem area, the connection between climate change and agriculture, is also emphasised in the strategic documents of the European Union. These documents focus on turning the agricultural sector more climate-resilient, reducing greenhouse gas emission, increasing the energy efficiency in agriculture and promoting renewable energy sources. In the period of 2007-2011, the greenhouse gas emission of the Hungarian agricultural sector slightly reduced at first then stagnated, while its ammonia emission steadily declined (KSH, 2013). The energy consumption of the agricultural sector also reduced by 20 percent from 2007 to 2010, but the overall energy costs remained the same because of the rising energy prices (KSH, 2013). This reduction is due to the

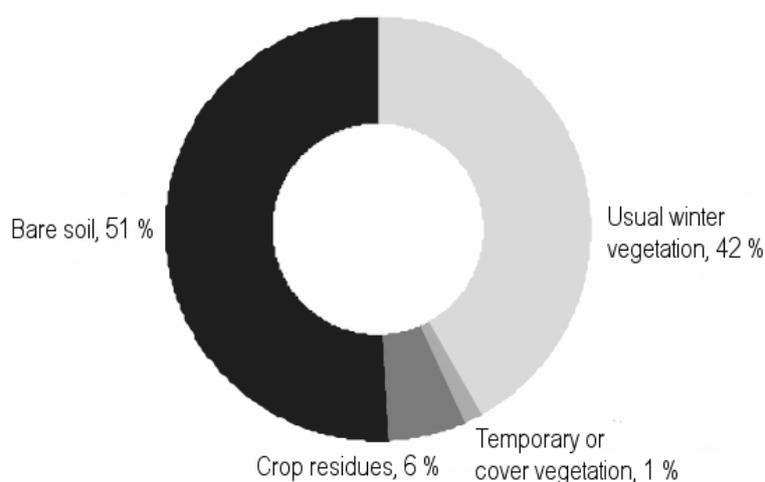
replacement of agricultural machinery with more effective ones, while the agricultural buildings are outdated and not energy-efficient.

It is important to note that the drop in energy consumption did not followed by a similar reduce in the emission of greenhouse gases. This shows that climate change measures cannot be limited to the continuous decrease of fossil energy sources; possibilities for substitution, promotion of renewable energy sources should also be emphasised in order to reach the global and national climate change goals.

The fifth priority of the Rural Development Programme is an important step towards a more climate-resilient economy. Because of the aforementioned economical and other reasons the significance of high-intensity agriculture will not decrease in the close future, which makes the measures to mitigate the effects of climate change less effective. It is necessary to concentrate on technologies, agricultural production methods and energy sources which could contribute to reach the goals set up by the European Union for 2020.

The Programme identifies it as a weakness that the water management does not pay enough attention to water conservation. The acceptable state of the irrigation system would be essential for good water management, but it currently does not meet the requirements. With the water as a natural resource getting more valuable, the poor conditions could easily became hindering factor when the adaptation to aridification will require the use of the latest water-efficient irrigation technologies. The area of irrigable land permitted by the Hungarian water law, around 200 000 hectares, did not change significantly in the period of 2007-2012 (KSH 2013). However, the amount of irrigated water – in close connection with the weather conditions – slightly increased. Because of the limitations of further growth, the notions of the Rural Development Programme about water management and water conservation should be emphasised.

Proper soil management and other agricultural methods with a focus on water conservation form an important part of water-efficient methods, but do not get enough emphasis in the Rural Development Programme. *Figure 2.*, displaying the share of different types of winter soil cover, proves the relevance of the problem. More than half of the agricultural land do not have any kind of cover during the winter, which increases evaporation loss and aggravate the water condition of the soils. It would be expedient to provide funds for changing these methods through trainings and awareness-raising campaigns.



**Figure 2. The share of different types of winter soil cover**

(Source: KSH, 2012)

Amongst the measures to mitigate the effects of climate change, the promotion of renewable energy sources – not only in the agricultural sector – gets special attention. Hungary's most abundant renewable energy source is biomass, which is closely linked to agriculture and forestry. However, it has to be mentioned that energy production from biomass has an ambiguous reputation, thus differentiation between the biomass produced solely for energy production and the biomass composed of by-products and organic waste of agriculture and forestry would be preferable. Only the latter should be considered as a truly renewable energy source, and the distribution of subsidies should be modified accordingly.

The extensive use of biomass for energy production, especially the increased use of wood (and its planned support), does not constitute as an effective measure against climate change. The growing share of firewood from the energy sources indicates the possibility that the subsidies for energy production from biomass may divert sources from the spread of truly renewable energy production, thus not contribute to achieve the original goals.

### **DISCUSSION AND CONCLUSIONS**

The analysis of the selected indices and processes in relation to the environmental impact of the Hungarian agriculture partially confirmed the OECD prognosis from 2008 about the growing negative environmental effects of the Hungarian agricultural sector. After the crisis of the early and middle 1990's, the intensity of Hungarian agricultural production started to increase again. This process influenced by numerous economic, social and regulatory factors. For the moment, these factors play a more important role in making rational production decisions than agro-environmental aspects. Hence the effects of the agro-environmental programmes lagged behind the original expectations, and characterized by constant reduce in both the number of participants and the included land area.

The authors' opinion is that the 2014-2020 programming period will have a crucial role in finding the balance between the market-oriented intensive farming and the ecological, economic and social functions of the Hungarian landscape. Because of the complexity of the agro-environmental system, finding the adequate measures won't be easy. One of the most important tasks is the renewal of the agro-environmental programmes in order to make them more attractive to the farmers and become a real alternative in the production decisions. Secondly, the promotion of intensive production methods and innovations (e. g. precision agriculture) which can reduce the environmental impact even in large-scale farms with intensive agriculture would also be preferable.

Regarding to climate change and renewable resources, multiple problems can be distinguished in Hungary. The most important is the problem of biomass, which should not be handled as one like the solar and wind energy. Biomass has many sources, including agricultural products, which take away land from food and fodder production. Moreover, this production technology is not sustainable in the long term (e. g. because its production requires fossil fuel). Priority should be given to biomass composed of by-products and organic waste of agriculture and forestry.

Moreover, using adequate production technologies and choosing plant species with a greater tolerate for aridity and extreme weather are the keys for climate change adaptation. With the most modern irrigation technologies, irrigation can be effective even with scarcer water sources.

In addition to this, we must not forget about people connected to agriculture and rural development. Even the most innovative methods and technologies are ineffective without people capable to use their potential.

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