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THE IMPACTS OF THE EUROPEAN UNION'S COMMON AGRICULTURAL POLICY ON AGRICULTURE IN SLOVAKIA

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Abstract

The impacts of the Common Agricultural Policy of the European Union on Slovak agriculture since the accession of Slovakia to the European Union, are discussed in this paper. Structural changes that were made are reflected in the developmental trends of various agricultural areas. In this paper, the changes in agricultural land use and its categories, in particular landscape types, as well as changes in the numbers and structure of the labour force, changes in the organizational structure of agricultural holdings, the development of cropland areas of the most important crops in crop production, and changes in the number of livestock, are discussed. This analysis also focuses on Slovakia's position in terms of overall agricultural production within the European Union member states.

Shrnutí

Dopady společné zemědělské politiky Evropské unie na zemědělství Slovenska

Příspěvek se zabývá dopady společné zemědělské politiky Evropské unie na zemědělství Slovenska od vstupu Slovenska do Evropské unie. Strukturální změny, které nastaly, se odrazily v trendech vývoje více oblastí zemědělství. V příspěvku proto analyzujeme změny využití zemědělské půdy a jejích kategorií v jednotlivých typech krajiny, změny týkající se vývoje počtu a struktury pracovní síly, organizační struktury zemědělských podniků, osevních ploch nejdůležitějších plodin rostlinné výroby a stavu hospodářských zvířat. Analýza je zaměřena i na postavení Slovenska v zemědělské produkci v rámci států Evropské unie.

Keywords: *European Union, Common Agricultural Policy, agricultural land, labour force, structure of holdings, structure of crops, number of livestock, agricultural production, Slovakia*

1. Introduction

By joining the European Union in 2004, Slovakia made an important step in its historical development. Integration into the European Union (EU) has affected all areas of the economic and social lives of citizens. Agricultural policy is a key element of the economic policy of each EU country. Agriculture is one of the most sensitive sectors of the economy, not only in Slovakia but also in the whole EU. As an economic sector, it has specific characteristics and regardless of its size or share in the national economy, it is strategic for any country. Maintaining agricultural production in less developed regions is one of the objectives of the Common Agricultural Policy (CAP), which is the most integrated of all EU policies and represents a relatively large share of the EU budget. The financial resources are redistributed at a European level among the EU-27 countries. The share of CAP in the EU budget has decreased sharply in recent decades: from 70% in the 1970s to around 40–34% in the period from 2003 to 2012. This decrease reflects the increase of EU competences in other areas and savings, which brought reforms but also the accession of 12 New Member States (NMS), without a significant increase of CAP costs.

A fundamental CAP reform was adopted in June 2003 (the so-called Fischler Reform), which changed the support for farmers. Its essence lies in the elimination of the connection between financial aid and production. The introduction of a common payment scheme for farmers paves the way for a greater focus on demand and therefore on the consumer, because without regard to what they produce, they will receive aid at the same level. The farmers could adapt to market requirements even more. Eco-production programmes and the proper treatment of animals are being stressed, and a greater emphasis is placed on rural development and biodiversity. CAP objectives are designed to enhance the effectiveness of support, to increase the productivity of agriculture through technological development and the optimum use of production factors, such as capital, agricultural land, and the labour force. The support should ensure the standard of living of the population working in agriculture. The support provision in the EU-27 countries gives farmers a guarantee of minimum prices and protects them from competition by third countries. To achieve the CAP objectives, the Common Market Organization was used. When problems with overproduction had emerged, the EU adopted various measures, especially lower guaranteed prices and common responsibility for overproduction (Buday et al., 2012).

Slovakia started preparations for accession to the EU in 1995. To prepare Slovakia for using financial resources from the funds of the European Union, the SAPARD Agency was established, through which projects within the pre-accession program were implemented until Slovakia entered the EU. In particular, the SAPARD program and also the PHARE program, as well as the bilateral support of EU member states, are directed to agriculture for adapting to the conditions of the Common Agricultural Policy. Since 2003, the Agricultural Paying Agency has started to

act in Slovakia, through which all subsidy flows from the EU funds and from the financial resources of national supports, directed to the field of agriculture and rural development, are administrated. By joining the EU, Slovakia has accepted the support rules of the agricultural sector, i.e. adopting the same support mechanisms, which are valid in the EU and the gradual increase of contributions to agricultural holdings from the EU budget until 2013. Direct payments granted to farmers in EU-27 had a different development in the original EU-15 and in the New Member States (NMS) after 2004 (EU-12). The prime intention of the CAP was to settle direct payments of the NMS (EU-12) to the level of the original EU-15 by 2013. They started at 25% and currently reach 90% of subsidies of the original member states. In the accession treaty, the NMS negotiated an option to add European subsidies from national budgets. Slovakia did not fully use this opportunity, thus reducing its competitiveness, and supports the expansion of foreign products on the Slovak market.

The aim of this paper is to assess the situation in Slovak agriculture on the basis of selected indicators in the pre-accession period and at present after joining the European Union. Moreover, we focus on the developmental trends of Slovakia's membership in the EU and on the adoption of the EU Common Agricultural Policy in the period of 2004–2010. Under the influence of the CAP, there were several structural changes in the NMS, which are related to the decline in the size of land and its use, decline and changes in the structure of workers in agriculture, as well as holdings in agriculture. These changes are reflected in the size of agricultural production and in the size and structure of cropland areas. We analyse in detail the changes and the use of agricultural land in the period of 2004–2010 in three types of agricultural landscapes in Slovakia (the landscape type with a prevailing share of arable land, the type of landscape with an almost balanced share of arable land and permanent grasslands, and the type of landscape with prevailing permanent grasslands), which were defined by Zelenský (2002b). A partial objective of the paper is also an analysis aimed to compare the CAP impacts on the development of EU-27 agricultural production in the period of 2004–2010. This comparison concerns the most important elements of crop and livestock production in the different groupings of the EU-27, EU-15, NMS, and Slovakia.

2. Theoretical and methodological background

Slovakia's accession to the EU in 2004 and the subsequent implementation of the Common Agricultural Policy and its impact on agriculture in Slovakia, is reflected in the works of not only agronomists and economists, but also geographers, ecologists and other professionals. Agro-economic research is presented in the works of economists, particularly by Buday (2004, 2006) and Buday, Bradáčová (2009), who deal with the market of agricultural land and land resources management after the enlargement of the European Union. Furthermore, Buchta (2003), Buchta and Buchta (2009) and Buchta, Federičová (2009), address the issue of employment in agriculture and deal with the impact of EU funds on agriculture and rural development in Slovakia. Comparing the CAP impact on the development of agricultural production – the production and volume of foreign trade in the EU-27 since 2004, was studied by Buday et al. (2012). The expected impact of EU agricultural policy on the development of agricultural production in Slovakia was studied by Falťanová (2008). Marušinec, Škriečka (2009) dealt with the analysis of the support system in agriculture. Geographers have researched this issue not only in Slovakia, but also in other NMS of the EU. Each of them brought into their works specifics of their countries and the impact of CAP on the development of agriculture and rural development. Some authors studied the impacts of CAP and the consequences of agricultural transformation at a national level, e.g. Jančák and Götz (1997), Bičík and Jančák (2005), Kabrda and Jančák (2006), Konečný (2010), Štolbová and Hlavsa (2008), Věžník and Bartošová (2004) and Věžník and Konečný (2011) in the Czech Republic, Hasinski (1999) and Kulikowski (2005) in Poland, etc. In Slovakia, Drgoňa, Dubcová, Kramáreková (1998) or Dubcová et al. (2008) deal with changes in the sectors of agricultural production and their spatial differentiation during the transformation of agriculture and the accession of Slovakia. Spišiak et al. (2005) address the socio-economic conditions of the Slovak countryside in relation to agriculture from 1989 to the present. Changes in arable land use in Slovakia and Bulgaria in two time horizons, 1990–2000 and 2000–2006, are studied by Kopecká et al. (2012).

On the other hand, the CAP impact on crop and livestock production is monitored in selected regions of Slovakia (e.g. Némethová, 2009a, 2009b, 2010; Spišiak, Némethová, 2008; etc.). Works of this nature are the interest of several experts – as well as geographers in the Czech Republic, such as Střeleček, Lososová, Kvapilík (2004), Svobodová and Věžník (2008), Svobodová (2010), and Vaishar, Zapletalová (2009). According to Svobodová and Věžník (2011), the impacts of the Common Agricultural Policy are both positive and negative. Positive impacts are reflected in the increased financial resources for farmers (even though they are not as high as in the older EU member states), which is associated with greater demands on administration. The most significant impact of the CAP is a decline in livestock production. Svobodová (2011) studied the impacts of the CAP in the Vysočina Region. On the one hand, they are positive – farmers have more income through subsidies, but on the other hand, in relation to the current setting of the CAP, which is grossly unfair for the NMS, there are significant changes in the structure of agricultural production and in other related industries.

Changes in agriculture are also more motivated by the present form of the EU's CAP which increasingly abandons the support provided for production and product, and puts a greater emphasis on environmental protection, development and maintenance of landscape, food safety, and proper conditions for breeding livestock (Ward et al., 2008 in Věžník, Konečný, 2011). Buchenrieder et al. (2010) deal with the characteristics and current trends in the rural areas of the NMS. They present a typology of rural areas and set out the main trends that have been recorded in these areas. Buchenrieder, Möllers [eds.] (2009) analyse in their case studies rural development and comparisons of structural changes in agriculture in some NMS (Romania, Poland, Hungary, Bulgaria) after accession to the EU. Experiences from rural development after joining the EU are presented in another study focused on selected regions of the EU-15. Davidova et al. (2010) deal with detailed analyses of the SCARLED (Structural Change in Agriculture and Rural Livelihoods) survey, which is focused on the adaptation of the workforce, self-supply and poverty, market integration and management, and topics related to agricultural holdings. The results of the SCARLED project are presented also in the study by Möllers, Buchenrieder, Csaki [eds.] (2011).

Shucksmith, Thomson, Roberts (2005) provide insight into the diversity of the rural environment in terms of demography and related indicators (education, productive age of workers in agriculture), as well as from an environmental aspect. Furthermore, these authors focus on the different economic performance of the rural environment (market functioning, institutions, networks, organizations). According to these authors, rural regions contribute to the quality of life due to their wide range of options. For the case of Ireland, the Rural Environment Protection Scheme (REPS) is introduced and other examples of applications of different approaches and policies are shown for France, Austria, and Finland. In their conclusions, they discuss the European programme Leader and its tasks for the period from 2000–2006.

This paper deals with the period from 2004–2010. Obtaining information from various available sources was also dependent on that period. Data on the development and structure of the labour force and agricultural holdings were obtained from the publication Poľnohospodárstvo SR v rokoch 1970–2005 (Agriculture of the Slovak Republic in 1970–2005), the Regional Branch of the Statistical Office of the Slovak Republic in Nitra, and from the 2010 Statistical Yearbook of the Land Fund in the Slovak Republic. We also used internal materials of the Research Institute of Agricultural and Food Economics in Bratislava. Changes in agricultural land use at the level of districts in Slovakia were analysed on the basis of statistical data obtained from the Regional Database at www.statistics.sk. We studied closely the development of the areas of arable land, permanent crops, permanent grasslands, and total agricultural land in 2004 and 2010. When analysing the development of agricultural land use changes, a basis was provided by the work of Blažík, Falťan, Tarasovičová and Saksa (2011). We examined an index of land use change – a synthetic indicator, which evaluates, using a single number, the proportion of areas where a change occurred in basic categories of agricultural land, at the level of districts in Slovakia between the two time horizons. This indicator shows the intensity of agricultural land use change. The indicator includes changes in all categories, but does not clarify the exact nature of the changes. Therefore, it had to be complemented with other indicators, e.g. an increase/decrease index.

The mathematical expression of the change index is as follows:

$$IZ_{(a-b)} = \left[\left(\sum_{i=1}^{n} |r_{ib} - r_{ia}|\right)/2c\right] \times 100\ [\%]$$

where, $IZ_{(a-b)}$ is the change index in the period from a to b, n is the number of land use categories (agricultural land), r_{ia} is the land area at the beginning of the period and r_{ib} at the end of the period, and c is the total area of the studied territorial unit.

The indicator which reflects the percentage increase (decrease) in various categories of land use (agricultural land), has the following mathematical expression:

$$ZR_{k(a-b)} = ([(r_{ib}/c_{ib})/(r_{ia}/c_{ia})] \times 100) - 100\ [\%]$$

where, $ZR_{k(a-b)}$ is the change in the area of a particular land use category (decrease/increase index), r_{ia} is the area of land at the beginning of the period and r_{ib} at the end of the period, c_{ia} is the total area of the studied territorial unit at the beginning and c_{ib} at the end of the studied period.

The change index was also used for analysing the number of workers in agriculture and the development of agricultural holdings in the period 2004–2010. By using this indicator, we illustrated the developmental trends in the size of cropland areas of the most important crops in the Slovak Republic and the trends in the number of livestock. The analysis that aimed to compare the CAP impacts on the development of agricultural production in the EU-27 was elaborated on the basis of data from Eurostat available at www.statistics.sk. From the obtained statistical data, we calculated the change index in the individual years of development and used them to calculate the average change index for the period 2004–2010. Using this indicator, we could analyse and compare the impacts of the CAP in different groupings of the EU-27, EU-15 and individual countries, namely Slovakia. When comparing the selected indicators of agricultural production, we focused on developmental trends in the EU NMS.

3. The impact of the CAP on the development of the land fund area

Before dealing with the development of agricultural land use, we have to look at the development of land resources as a whole in the study period 2004–2010. The development of various forms of the utilization of land resources was analysed on the basis of a simple change index which expresses the share of the areas between two time horizons. As for agricultural land and its various categories, we recorded a decrease in the size as compared with the increase in other forms of land resources use. The most significant increase can be seen in the 'other' area (5.5%) and in the built-up area (2.2%). Regarding agricultural land, the most significant decrease was recorded in the size of hop gardens (– 7.3%) and orchards (– 4.9%). A decrease in size was recorded also in agricultural land (– 0.8 %) and arable land (– 1.0%). Moreover, the decrease concerned also gardens (– 1.0%), vineyards (– 0.9%) and permanent grasslands (– 0.5%).

The size of agricultural land in the study period decreased each year because of the development of Slovak society, its economic direction, the construction of commercial and residential suburbanization in green areas, but also due to the agricultural policy of the state. Changes in the structure of agricultural land and its size had started already in the period of agriculture transformation after 1989 and continue to the present. The decrease in the cropland areas of major crops in the Slovak Republic, as well as the decrease in the number of livestock, especially cattle and pigs connected with the transformation of agriculture, is reflected in various land use changes. The current trend of decreasing agricultural land area will continue, as a result of the development of society and its economic activities. Since 1990, the size of agricultural land gradually decreased from 2,453 thousand ha representing 50.0% of the total land area of Slovakia, to 2,434 thousand ha in 2004; in 2010, it amounted only to 2,414 thousand ha (49.2%). The largest share of agricultural land is seen in arable land, which in the years 2004–2010 decreased by 13,961 ha and thus its share in 2010 reached 58.7% (in 1990, the share of arable land was 61.5%). Arable land was used mostly for residential developments, industry and transport structures. In mountainous areas at higher altitudes and slopes, arable land was unused or turned to grasslands. In the structure of agricultural land use, permanent grasslands recorded the second largest area

with 876,484 ha (36.3% of agricultural land) in 2010. The share of permanent crops grown on agricultural land was the smallest (5.0 %) with 121,174 ha.

After Slovakia's accession to the EU, the demand for land increased, especially on the part of foreign developers, which also is reflected in the increasing prices of land. Currently, the market price of agricultural land differs significantly from the level of official land prices and the difference will continue to increase. According to Buday (2006), the market price ranges from the average official land price to three times its value. The land market changes mainly to non-agricultural purposes, for the construction of industrial, logistic and retail parks, where the main investors are foreign entities, and also for the purposes of civil and housing construction in municipalities and suburban areas. The average official price of agricultural land in Slovakia is 1,256 € / 1 ha^{-1}: arable land at 1,759 € / 1 ha^{-1} and permanent grasslands at 400 € / 1 ha^{-1}. The most expensive agricultural lands occur in the western part of Slovakia. This area includes districts with the highest-quality land in the Slovak Republic and the highest share of arable land: Dunajská Streda, Galanta, and Trnava in the Trnava Region, and Nové Zámky, Šaľa, Komárno, Nitra in the Nitra Region (internal materials of the Research Institute of Agricultural and Food Economics, 2009).

4. Development of agricultural land use in the landscape types of Slovakia: 2004–2010

Based on the influence of physical-geographical factors, Zelenský (2002a, 2002b) recognized three types of agricultural landscapes in Slovakia: landscapes with a predominant share of arable land; landscapes with an almost balanced share of arable land and permanent grasslands; and landscapes with predominantly permanent grasslands. The type of agricultural landscape with larger shares of arable land is situated in lowlands and low-lying basins of Slovakia, where arable land prevails over permanent grasslands. Arable land covers more than 70% of agricultural land and permanent grasslands cover only about 20%. This type can be found in the southernmost parts of Slovakia with the most suitable soil and climatic conditions for growing most of the crops. It is an area comprising the Podunajská rovina (plain), Podunajská pahorkatina (hills), Juhoslovenská kotlina (basin), Košická kotlina (basin), Východoslovenská nížina (lowland), and part of the Záhorská nížina (lowland). This landscape type is a major production area for cereals, grain maize, root crops and vineyards in Slovakia. Cereals cover about 44% of the arable land, mostly wheat and barley. Sugar beet, which was characteristic for this type of agricultural landscape, has almost disappeared from the fields. Growing sugar beet was replaced by oilseeds, which currently represent the most favoured product on the market.

The development of agriculture in the period 2004–2010 was reflected not only in the decline of agricultural land, but also in the structure of its use. When analysing these changes, we used the synthetic change index and the decrease/increase index. The synthetic change index was used to monitor agricultural land use changes between the two time horizons of 2004 and 2010, which also included changes in the internal structure of land use. According to this indicator, we recorded mainly a decrease of agricultural land in all three landscape types. In the type of landscape with a predominant share of arable land, a high decrease (– 0.4%) was recorded mainly in the area of the Podunajská pahorkatina (hills): the Trnavská pahorkatina (hills), Nitrianska pahorkatina (hills), and the Žitavská pahorkatina (hills). The lowest decrease, ranging from 0–(– 0.2)%, was recorded in the districts of the Podunajská rovina (plain), Hronská pahorkatina (hills), and in the Košická kotlina (basin) (Fig. 1). Only in the two districts of Košice IV and Michalovce, was a positive change index recorded, which reflected an increase in agricultural land.

The type of landscape with an almost balanced share of arable land and permanent grasslands can be found only locally at higher elevations of the Turčianska kotlina, Popradská kotlina, and Hornádska kotlina (basins). Mainly barley and potatoes are grown there. In almost all the regions belonging to this type, we recorded a decreasing size of agricultural land, with the greatest decline over – 0.4% observed in regions of north-eastern Slovakia. The type of landscape with prevailing permanent grasslands covers higher and the highest basins, highlands, and partly mountains. It is located mainly in the northern, north-eastern, and also in the central part of Slovakia. In this type of landscape, more than 60% is covered with permanent grasslands and the rest is arable land and permanent crops. It represents the largest potato growing area in Slovakia. It is also the largest area for growing rye. In regions situated more to the south, wheat and grain maize are also being grown. In this landscape type, the change index obtains predominantly negative values except for the border districts such as Čadca, Námestovo, Púchov, Dolný Kubín and Sabinov in the north-eastern region of Slovakia. Generally, values of the change index range mostly from – 0.2% to – 0.4% (Fig. 1).

The second indicator is the increase/decrease index representing a relationship between the increase or decrease of land in each category – agricultural land, arable land, permanent crops, and permanent grasslands. According to this index, the landscape type with the prevailing share of arable land is characterized by a slight decrease of agricultural land (from 0–(– 0.1)%. Studying the changes of agricultural land as a single unit (without changes in its internal structure), we recorded minor changes in its dynamics. Decreases indicating changes concerned the hilly regions of the Podunajská nížina (lowland), the Juhoslovenská kotlina (basin), and in particular the Východoslovenská nížina (lowland). Larger decreases in agricultural land (> – 0.1%) and more can be seen in the regions lying at the Trnavská pahorkatina and Nitrianska pahorkatina (hills) in the western part of Slovakia. This agricultural land was used more for non-agricultural purposes. Part of the Košická kotlina (basin) is characterized by an increasing size of agricultural land. Similarly, a slight decrease of agricultural land is also characteristic for the type of landscape with an almost balanced share of arable land and permanent grasslands. A decrease of agricultural land can be seen also in the landscape type with prevailing permanent grasslands, except for the border regions in the north of Slovakia where the area of agricultural land increased. This agricultural land is used for cattle and sheep breeding. Similarly, we used the increase/decrease index to study changes in other categories of agricultural land. An increase in arable land was recorded in the type of landscape with the prevailing share of arable land locally in the Záhorská nížina (lowland), Podunajská rovina (plain), Hronská pahorkatina (hills), and in the Košická kotlina (basin) in Eastern Slovakia. Other regions of this type recorded a decrease. The type of landscape with an almost balanced share of arable land and

permanent grasslands was also characterized by a decrease in arable land, except for the district of Sabinov. Locally, a slight increase in arable land could be observed even in regions belonging to the type of landscape with predominant permanent grasslands. Other regions of this type recorded a decrease in arable land, with a more significant decrease seen in the northern and central parts of Slovakia (Fig. 2). A greater part of arable land in these regions is under grass and is used for extensive cattle and sheep breeding.

Permanent crops recorded a decrease in all landscape types of Slovakia. A more significant decrease in the landscape type with a prevailing share of arable land can be seen in the Záhorská nížina (lowland) and in the southern part of the Trnavská pahorkatina (hills). A minimal increase in permanent crops is seen in the regions of the Juhoslovenská kotlina (basin) and in the southern part of the Východoslovenská nížina (lowland). Also, the regions with the type of landscape with an almost balanced share of both

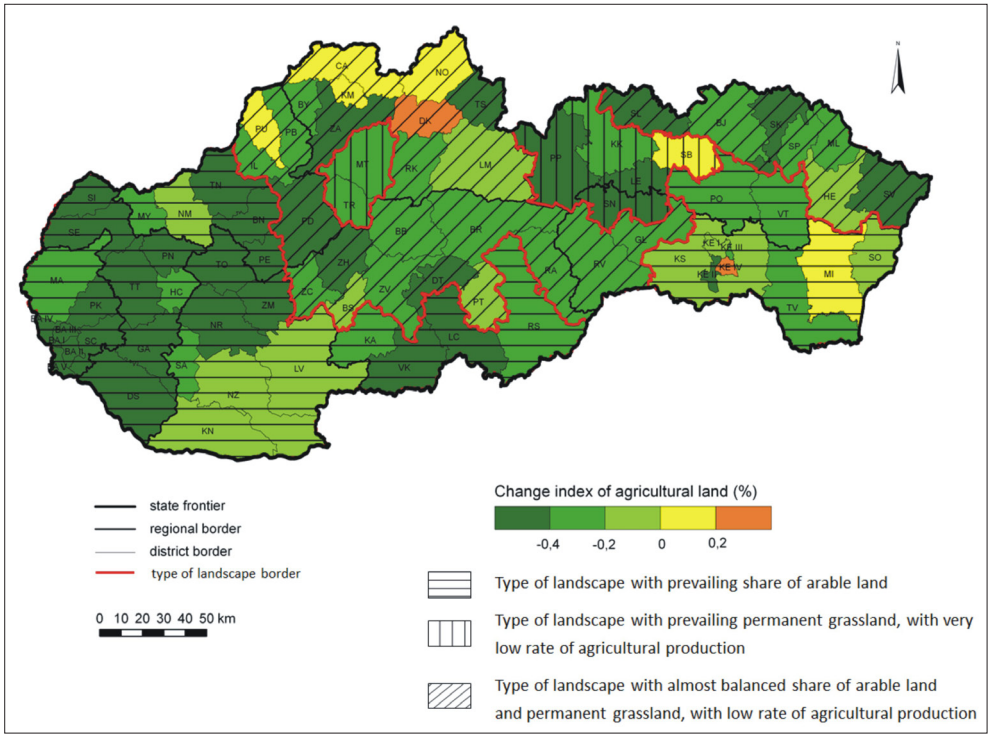

Fig. 1: Change index of agricultural land in the districts of the Slovak Republic: 2004–2010
Sources: Regional database of the Statistical Office of the Slovak Republic, 2013; authors´ calculations

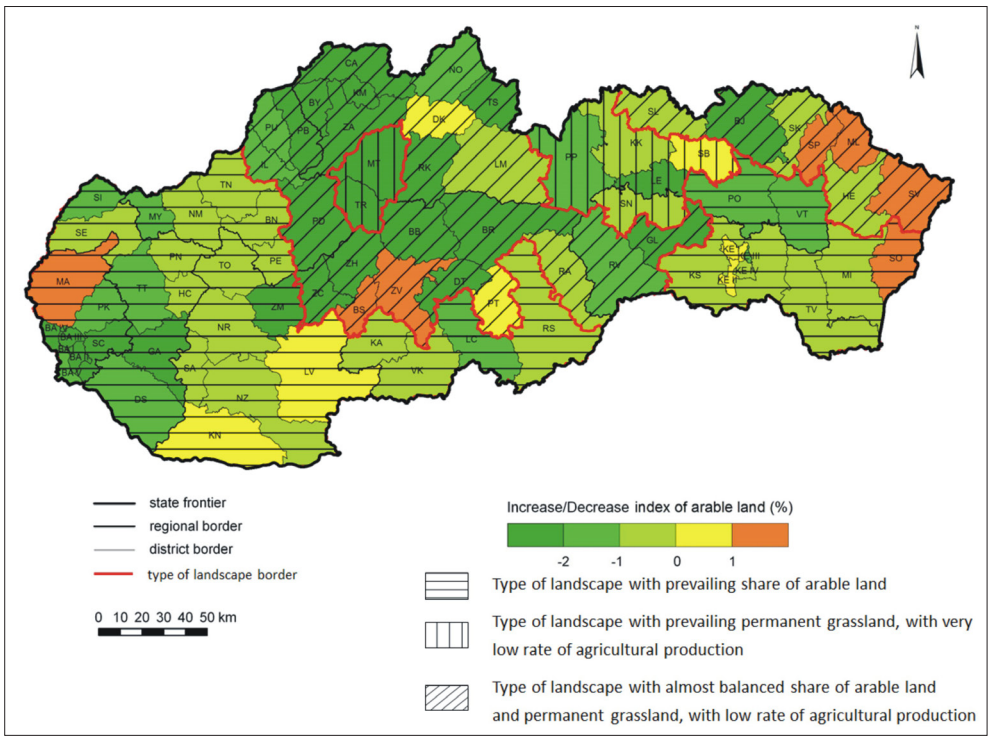

Fig. 2: Increase and decrease of arable land in the districts of the Slovak Republic: 2004–2010
Sources: Regional database of the Statistical Office of the Slovak Republic, 2013; authors´ calculations

categories are characterized by a decrease, except for the district of Martin. All regions with predominant grasslands are characterized by a decrease in permanent crops, except for the districts of Rožňava and Tvrdošín. A more significant decrease of permanent crops is recorded in northern and north-eastern Slovakia and in medium elevations basins – Žiar, Pliešovce, Zvolen, and Horehronské podolie. In the type of landscape with prevailing permanent grasslands, we can observe also a significant increase (over 1%), mainly in the districts in the north of Slovakia. A moderate increase of this category is observed also in Eastern Slovakia. Other regions belonging to this type are characterized by a slight decrease. Also in regions with a balanced share of both categories, we can see an increase in permanent grasslands, while a greater increase (over 1%) is recorded for the Turčianska kotlina (basin). In contrast, districts belonging to the landscape type with a predominance of arable land, demonstrate a decrease of permanent grassland. A considerable decrease can be seen in hills of the Podunajská nížina (lowland). An increase is observed only locally in the Podunajská nížina (lowland), especially in the regions of the Chvojnická and Myjavská pahorkatina (hills). A continuous strip of increase can be seen in the northern part of the Východoslovenská nížina (lowland) (Fig. 3).

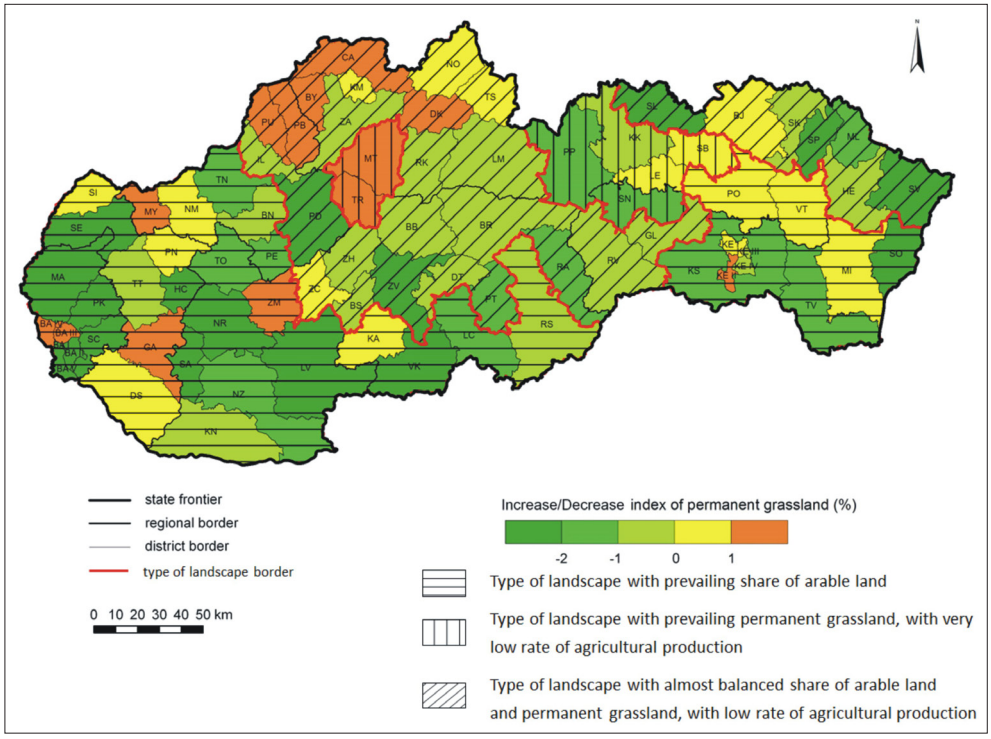

Fig. 3: Increase and decrease of permanent grasslands in the districts of the Slovak Republic: 2004–2010
Sources: Regional database of the Statistical Office of the Slovak Republic, 2013; authors´ calculations

5. CAP impact on the development of the labour force in agriculture

Employment in Slovak agriculture has gone through significant changes. Before 1989, agriculture was characterized by a high number of employees, because it employed so-called marginal social groups that had no other opportunities for local employment and it fulfilled an important social function, especially in employing the rural population. In this way, "hidden employment" emerged. The decline in such employment of Slovakia in the 1990s was influenced primarily by 'existential' problems of agricultural holdings, and by problems with ensuring the functioning of agricultural production because of changes in the country's agricultural policy. Production costs increased due to increasing input prices (oil, fertilizers, seeds, feeds) and, on the other hand, the income from agricultural production decreased (Falťanová, 2008). The dramatic decrease of workers in agriculture also changed the overall structure of the rural population. In 1990, Slovak agriculture employed 301,500 workers, representing 13.3% of the total labour force. In 1994 (Tab. 1), this figure was only 178,700 (10.2%), while in the EU-15 it was 5.3%. The decline of the labour force in Slovak agriculture persisted even at the time of the country's accession in the EU. In 2004, agriculture employed 86,600 workers, of whom 63,100 were

Year	1994	1998	2000	2004	2005	2006	2007	2008	2009	2010	Change index 2010/2004	Decrease (in %)
Number of employees	178,7	134,8	111,9	86,6	81,5	77,4	75,5	72,3	65,3	56,3	65.0	– 35.0

Tab. 1: Development of the number of employees in Slovak agriculture (in thousand persons)
Sources: Internal materials of the Regional Office of the Statistical Office of the Slovak Republic, Nitra, 2012; Agriculture of the Slovak Republic in the years 1970–2005

men and 23,500 women. By 2010, agriculture recorded a significant decrease in the number of workers by up to 35%: the number of workers decreased to 56,300, of whom 42,600 were men and 13,700 women (Tab. 1).

The development of the number of agricultural holdings is also reflected in the employment rate of different organizational and legal forms. With the decreasing number of cooperatives, the share of employees in them decreased (e.g. in 2000, the share was 70.4%, but in 2007 it was only 64.2%). On the other hand, with the increase in the number of business companies, the share of employment in this organizational-legal form also increased. While in 2000, 27.3% of persons worked in business companies, in 2007 it was 34.6%. Reducing the number of employees in agriculture also had a positive impact on the growth of labour productivity in this sector, as well as on the more efficient use of significantly lower subsidies going to agriculture. Changes in employment in agriculture is basically in accordance with the structural changes that took place in the whole of Slovakia, as well as in other EU countries (e.g. in EU-15 in 2006 3.7% of workers was employed in agriculture and in Slovakia it was 3.6%).

In recent years, the decline of the labour force in agriculture has been more intensive in the NMS than in the countries of EU-15. In countries such as Slovenia, Latvia, Lithuania and Poland – countries with many small farms – there was much less outflow of labour in the first half of the 1990s. In these countries, agricultural employment gradually started declining in the second half of the 1990s. In Romania, on the other hand, agricultural employment continued to increase until 2001 (employment increased in the period of 1996–2001). This increase resulted mainly from the strong general economic decline between the years 1996–1999, when reductions in industrial employment caused people to fall back on farming as a survival strategy. Since 2001, however, agricultural employment has started declining like in all other NMS (Davidova et al., 2010 in SCARLED).

Despite the declining share of agricultural employment in the NMS, however, the agricultural sector remains important as it accounts for 4% of GDP and 15% of total employment. This is a large difference if compared with the EU-15, where the share of agriculture in GDP is only 1.7% and its share in employment is 3%. In most of the NMS, there is still a significant share in agricultural employment. There are also large differences among the NMS (Davidova et al., 2010 in SCARLED). An overwhelming high share of employment can be observed in Romania (29.5% in 2007), but also in Poland and Slovenia it is above 10%. Most of the land in these countries is managed by small family farms, which makes the restructuring of agriculture and the increase of productivity difficult. Farms are characterized by hidden unemployment, low levels of education of workers, difficult access to inputs, inefficient size, etc. High shares in employment do not correspond with the relative contribution of agriculture to GDP in these countries. While in Hungary, Poland, and Slovenia, agriculture accounts for less than 5% of GDP, it is still important for Romania (8.8%) and Bulgaria (6.2%).

In all five countries, however, the share of agriculture in GDP has been declining since economic growth started after the transition shock to the market economy (Buchenrieder et al., 2010 in SCARLED). Currently, the EU-27 features a growing service sector and a decline of employment in industry and agriculture.

One positive phenomenon is that the educational structure of workers in Slovak agriculture has improved. The share of highly skilled people mainly with university education has grown steadily. In the structure of the workforce in 2004, the share of skilled workers accounted for some 53.9%. By 2010, their share had increased to 57.3%. The second largest group in 2004 included workers with only completed secondary education; their share in the total amount of workers amounted to 25.5%. In 2010, however, their share was only 19.4%. Workers with primary education were counted at 13.9% in 2004. By 2010, their share had increased to 14.7%, due to the departure of young skilled workers from agriculture, the subsequent increasing share of older age groups, as well as the nature of agriculture, which for undemanding tasks in certain facilities continues to require workers with only primary education. Highly skilled workers in 2004 amounted to only 6.9%. During the studied period, there was a favourable, but still insufficient increase in their share to 7.5%. The introduction of innovations, reduction of financial costs, simplification of the manufacturing processes or increase in revenues from the sales of goods and services, require a highly skilled labour force which is still lacking in Slovak agriculture.

Differing in extent, Western and Eastern European countries show an over-ageing in the group of private farm household operators: e.g. in Hungary only 8% of farm operators are younger than 35 years, while 45% are 55 years and older. A majority of the workforce within the group of small farms, but also in large farms, has moved into retirement. These developments entail strong implications for a structural change of the farm. The high share of farmers aged 55 and above gives a significant hint that the next 15 years will be characterized by an intensive phase of potential farm transfers or farm closings, because of the absence of a successor generation of farmers.

Farm closures, in turn, entail an acceleration of structural change by way of thinning the number of farms as well as increasing farm sizes. The low percentage of young farmers in the group of individual farms shows that the private agricultural sector does not attract many young people. Agriculture lacks qualified personnel and this problem affects even larger farms (Davidova et al., 2010 in SCARLED). In Slovakia, legal entities dominate over natural persons in the structure of holdings operating in agriculture. Family farms, which are typical for other EU member states, account only for minimal numbers in the structure of agricultural holdings in Slovakia; however, their numbers are beginning to rise.

The decreased number of employees in agriculture is reflected in negative changes of the age structure of the workforce in Slovakia, in all types of holdings. During the studied period, there was a growing share of workers in older age categories, while the share of younger workers declined steadily. While in 2004 the share of workers aged 55–59 years was 9.7%, in 2010 it was about 16.7%. The share of workers aged 50–54 years compared to 2004 increased to 22.5% of the total number of workers. For this age category, the situation in the labour market is difficult in the case of work change. The upward trend is also in the oldest age category (60–64), the share of which increased from 1.4% in 2004 to 4.0% in 2010: Slovak agriculture is ageing, too. Conversely, the share of younger age categories is continuously declining. In 2004, the share of workers in the age category of 30–34 years was 8.5% while in 2010 it

was only 5.4%. A similar decrease was in the category of workers aged 20–24 years the proportion of which decreased from 3.9% to 2.3%.

This lack of interest to work in agriculture on the part of young people is caused mainly by minimum salaries. The average monthly wage in agriculture is one of the lowest within all sectors of the economy. In 2010, it amounted to 75.6% (581 €) compared to the average monthly wage in the national economy (769 €). Currently, the average nominal wage in agriculture demonstrates a slowly growing trend. Working in this sector of the economy appears to be unattractive and physically demanding to young people. Currently, in the NMS, agricultural workers quit their jobs predominantly because of retirement or younger and more educated workers apply for a job in other sectors with better financial conditions. It is not expected that these workers will affect migration to the EU-15 countries. In rural regions of the poorest and least developed NMS, agriculture remains an important source of income since a large percentage of the rural population is employed in agriculture (e.g. in Romania and Bulgaria). In more developed rural regions of the NMS, rural employment includes new activities such as landscape protection and development with regard to ecology and production of energy from biomass. Diversification of agricultural activities is an important source of employment, especially in the area of processing agricultural crops, services, agritourism, etc.

6. CAP impact on the development of the structure of agricultural holdings and land ownership

Changes associated with the transformation of the society to a market economy led to the end of agricultural holdings operating before 1989 and to the emergence of new agricultural holdings. State-owned companies almost disappeared and the total number of holdings rapidly increased, holdings which were created during the first stage of the disintegration of collective agrarian cooperatives and later state properties. Private ownership and on-going restitution gave rise to self-employed farmers. Some of the state-owned companies are still operating as strategic entities with a focus on scientific and research activities, e.g. plant and animal production research institutes, research institutes, breeding institute, or state companies specialized in gene-pool conservation. In 1990, there were 1,187 holdings dealing with agricultural production. By 1999, their number increased to 22,689 and from that year, their number began to decrease rapidly (e.g. in 2001 there were only 7,510 holdings). In 2004, altogether 9,757 holdings were dealing with agricultural production in Slovakia. By 2010, the number of holdings increased slightly to 9,802 by 0.46% (Tab. 2).

In the studied period, agricultural cooperatives recorded a decrease by 84 holdings. In terms of farmland area, cooperatives retain a dominant position in agriculture, but their share in the total area is declining every year. While in 1994 cooperatives owned almost 70% of agricultural land, in 2007 it was only 40%. The number of business companies has increased dynamically and also their share of agricultural land has increased (e.g. in 1994 they farmed on less than 5% of land and in 2007 it was 45%). From business companies, a greater part of agricultural land (over 35%) is managed by limited liability companies (s.r.o.). In 2004, there were 1,171 business companies. By 2010, their number increased to 1,518, which is an increase of 29.6%. Within the business companies, the largest group is represented by limited liability companies with 1,044 holdings. By 2010, their number had increased to 1,389 (by 33.1%). Every year, there is a fluctuating number of natural persons working in Slovak agriculture (self-employed farmers), but their share in farming agricultural land is increasing. At present, legal entities manage 90% of agricultural land and the rest of land is used by natural persons, especially by self-employed farmers.

According to the Farm Accountancy Data Network (FADN, 2004), in the Slovak Republic there are on average 550.83 ha of agricultural land per farm, which is

Year/Legal form	State-owned companies	Agricultural cooperatives	Business companies				Other legal entities	Natural persons	Total
			total	v.o.s	s.r.o.	a.s.			
1994	211	961	128	1	98	29	50	7,581	9,059
1998	4	831	529	7	451	71	0	16,909	18,802
2000	1	738	647	3	559	85	0	20,355	22,388
2004	6	668	1,171	1	1,044	126	72	6,669	9,757
2005	5	601	1,087	1	959	127	110	7,172	10,062
2007	5	603	1,284	2	1,159	123	148	6,893	10,218
2008	5	596	1,251	1	1,121	129	111	7,050	10,264
2009	6	597	1,324	1	1,195	128	141	7,000	10,393
2010	5	584	1,518	1	1,389	128	148	6,029	9,802
Change index 2010/2004 (in %)	83.33	87.43	129.63	100.00	133.05	101.59	205.56	90.40	100.46
Increase/decrease (in %)	– 16.67	– 12.57	29.63	0.00	33.05	1.59	105.56	– 9.60	0.46

Tab. 2: Development of the number and structure of agricultural holdings in Slovakia (note: v.o.s. – public business company, s.r.o. – limited liability company, a.s. – joint-stock company)
Sources: Internal materials of the Regional Office of the Statistical Office of the Slovak Republic, Nitra, 2012; Agriculture of the Slovak Republic in the Years 1970–2005

the most among the 24 member states (Malta, Romania and Bulgaria were not included in the statistics for the studied period). This means that in the Slovak Republic the farmed agricultural land is managed by a small number of holdings, which manage large areas of land. The average for the 24 monitored countries is 34.33 ha per farm, and only in three other countries does the concentration of farmed land attain about 100 ha per farm – Czech Republic (266.23 ha), UK (140.05 ha), Estonia (107.76 ha) (Marušinec, Škriečka, 2009). Other EU countries reach significantly lower average areas of land. In most NMS, there is a high share of small farm holdings. From about 10 millions of farms up to 4 ESU in the EU-27 seven million are located in Bulgaria, Hungary, Poland, Romania, and Slovenia. Those farms are usually subsistence and semi-subsistence farms marketing only their annual surplus. Structural change in rural areas calls for reducing the share of small farms and for strengthening competitive commercialised family farms and large-scale corporate holdings. The Farm Structure Survey for 2007 found a decreasing number of agricultural holdings in all monitored countries and the group of competitive commercialised farms was still underdeveloped. It remains a major task to solve this structural problem, otherwise the NMS will not catch up with the EU-15 in the productivity and competitiveness of the agricultural sector (Buchenrieder et al., 2010 in SCARLED). Holdings with a larger farmland area are characterized by higher production and greater competitiveness. Conversely, small holdings with a smaller area of agricultural land are characterized by the low concentration of capital, land and labour force, and have low ability to succeed in markets with high volumes of production (as the large holdings do). Therefore, customers are pushing to reduce selling prices continuously, which may result in a loss of position on both domestic and foreign markets. Small producers with no profit leave the agricultural sector due to the increase of larger production units, which is understandable, since the benefits of favourable market and strategic conditions (approaching prices, direct payments, and access to investment support) increase proportionally with the farm size (Buchenrieder et al., 2010 in SCARLED).

While European farmers operate on average 50% of leased land, Slovak farmers and also Czech farmers, compared to other European farmers, operate mostly leased lands, which represents more than 90% of agricultural land. By far the greatest part of agricultural land is used by legal entities – cooperatives, joint-stock companies (a.s.), and limited liability companies (s.r.o.) which do not own the land but lease the land from the Slovak Land Fund or from the owners, for very low rents amounting to 1–2% of the official land price.

7. CAP impact on the development of agricultural production

After the transition of Slovak agriculture to a market economy after 1989, structural changes have taken place associated with the change of ownership, the organizational structure of holdings, the number of employees, and the policy of subsidies. The first years of transformation were the most critical in the overall existence of agriculture. The situation was complicated by decreased or cancelled agricultural subsidies, by constantly rising prices of inputs into production, or by existential problems or termination of several agricultural first-production holdings. Consumer prices increased while real incomes fell many times and domestic demand declined. All of this was also reflected in lower agricultural production in the first years of transformation.

The development of agricultural production gradually stabilized after Slovakia's accession to the EU-27. When comparing the years 2004 and 2010, there is a slight increase in gross agricultural production (GAP) by 5.9%. A higher increase by 10.4% is recorded in gross crop output (GCO), while gross animal output (GAO) decreased by (– 1.9%). During the transformation of agriculture in Slovakia, GAO prevailed over GCO. Basically, its dominance lasted until 2006, and from 2007 GCO has begun to prevail. In 2010, livestock production accounted for 43.8% and crop production for 56.2%. The decrease in the share of livestock production from total agricultural production resulted from the decreased total number of livestock in this period. In the EU-15 during the studied period, there was an increase in all production indicators, as well as within the EU-27 where the increase in current prices amounted to more than 11%. Slovakia increased agricultural production in 2010 compared to 2004 at current prices by 5.9% (95 million €), crop production increased by 82 million €, and livestock production decreased by 15 million €. In all NMS except for Greece and Hungary, agricultural production increased. In these two countries, there was also a decrease in crop production while in the other EU-12 countries, crop production in 2010 increased as compared with the year 2004. Only Slovakia and Bulgaria are characterized by a decrease in livestock production. Other EU-27 recorded an increase in livestock production (Eurostat Database, 2012; Buday et al., 2012).

Growing agricultural crops heavily depends on the market economy. Regional markets for agricultural products in Slovakia are practically non-existent, and agricultural holdings are linked to national and global markets. The constant opening of gaps between the growing prices of inputs and stagnant or declining prices of products causes a constant decrease in the profits of agricultural holdings and hence their added value. This forces them to reduce input costs and thus seek new possibilities of production. The pressure of global markets to reduce prices of agricultural stock forces agricultural holdings mainly to introduce technological and process innovations, which would make it possible to increase work productivity.

After Slovakia's accession to the EU, significant changes occurred in the cropland areas. This had to do particularly with the exclusion of certain commodities from the policy of subsidies; cropland areas of potatoes and quotas of sugar beet production decreased. The structure of crops in 2004 was dominated by cereals, which accounted for 61.0%. By the end of the period (2010), however, their share decreased to 50.4%; nevertheless, cereals still remain dominant in the structure of crops. The biggest decrease in cereals is recorded in the cropland areas of rye, barley, and oats. In most EU-27 (in 24 countries) the trend of development of cereals production was declining. Cereals production increased only in Latvia, Estonia, and Belgium. In 2010 as compared to 2004, the production of cereals decreased in the EU-27 by 12.9% and in the EU-15 by 10.5% (Tab. 3). The development of cereals production in Slovakia had a declining trend except for the year 2008. In 2010, Slovakia's share in the production of cereals within the EU-27 accounted for only 0.9%. Up to 72.3% of cereals are produced in the EU-15 countries.

In the structure of crops, growing grain maize plays an important role, which results from the suitable climatic conditions of Slovakia. During the period 2004–2010,

Country, Grouping	2004	2005	2006	2007	2008	2009	2010	Average index	Change index 2010/2004	Decrease (in %)
EU-27	324,765	287,290	269,057	260,041	315,353	296,267	282,900	98.2	87.1	– 12.9
EU-15	228,686	202,188	198,011	196,254	227,865	213,455	204,655	98.5	89.5	– 10.5
Slovakia	**3,793**	**3,585**	**2,929**	**2,793**	**4,137**	**3,330**	**2,571**	**96.2**	**67.8**	**– 32.2**

Tab. 3: Development of cereals production (in thousand tons)
Sources: Eurostat Database, 2012; Buday et al., 2012

cropland areas of grain maize increased by 13.6%. According to available data in the EU-27 and also in the EU-15, the production of grain maize had a decreasing trend in these groupings. Slovakia increased the production of grain maize by 10.4%, representing an increase of 90 thousand tons. Besides Slovakia, in 2010 as compared to 2004, only the Czech Republic and Lithuania recorded an increase from the NMS. After the decline of livestock production, which consumed two-thirds of the total cereals production, biofuel processors have become an alternative, which allow farmers continuous land management. About 200,000 tons are used for the production of compound feeds. The rest of the grain maize is, in addition to food purposes, used to produce biofuels – similar to oilseed rape.

In 2010 as compared to 2004, cropland areas of potatoes in Slovakia recorded the most significant decrease (– 54.2%). Similarly, in the development of potato production in Slovakia, there was the biggest decrease (by 67%) in 2010 as compared to 2004. The production of potatoes decreased by 256,000 tons. Slovakia was an important potato growing country in the past: it has become a significant importer of this crop, however, particularly from Poland. Even within the EU-27 and EU-15, we record a decrease in the production of this crop. The biggest producers of potatoes from the EU-12 are Poland and Romania. When entering the EU, Slovakia defended sugar production quotas to the satisfaction of sugar companies, the number of sugar beet growers began to decline thereafter because there was not a mutual agreement among the processors and growers of sugar beet. The cropland areas of sugar beet began to shrink and sugar factories were closed. In 2004, the cropland areas of sugar beet represented 2.6%, but in 2010, it was only 1.2%.

Oil seeds are very important crops in Slovakia, demanded on the market for energy purposes, which is reflected in their relatively large share in the structure of crops (in 2004 – 13.7%, in 2010 – 19.8%). Development of oilseed rape production from 2004 to 2010 had an increasing trend both in the EU-27 and in the EU-15. Development of oilseed rape production in Slovakia in the studied period also recorded a significant increase by 30.1%, which is an increase by 79 thousand tons. Slovakia's share on the production of oilseed rape in the EU accounted for about 2%. According to available data, all EU-27 are characterized by increased production. In 2010 as compared to 2004, we recorded a decrease in the production of legumes (– 20.0%), grapes (– 17.7%), and annual fodder crops (– 19.3%) in the structure of crops in Slovakia. After the accession to the EU, mainly vegetable growers had problems with competitors (decrease in the cropland areas). The opening of the European market meant an influx of cheap surplus vegetables and potatoes from the other EU countries. Gradually, we have recorded an increase in the cropland areas of vegetables and perennial fodder crops since 2008. This increase is conditioned by the gradual reclamation of permanent grasslands, as well as by the support from the EU for breeding livestock on permanent grasslands.

Before the transformation of agriculture, livestock production was characterized by a high number of animals as their breeding was more subsidized by the state. When comparing the years 1990 and 2007, the number of cattle decreased by 68%, pigs by 62%, sheep by 42%, and poultry by 21% (Falťanová, 2008). Due to decreasing subsidies, there are problems of covering the costs for production, which is reflected in increasing prices of products from livestock production on the market. It can be seen mostly in the decreased consumer demand for beef and pork meat and a sharp increase of demand for poultry meat, which is cheaper. The year 2004 was an unfavourable period for livestock production. This was mainly due to problems in the sales of meat and meat products because of the increasingly competitive environment in the common EU market. Unequal conditions between the old EU countries and NMS caused a further reduction of cattle and pigs, resulting in the loss of self-sufficiency in meat production in Slovakia. Currently, the Slovak market lacks meat, which is compensated by increased imports of cheap meat from abroad. Slovakia used to be self-sufficient in meat production, but it has become dependent on meat imports since 2000. Almost one half of the meat consumption is imported from abroad. While the number of cattle was 540 thousand heads in 2004, in 2010 it was only 467 thousand heads, which represents a decline by 13.5%. The decrease in the number of cattle was affected by the size of the production of concentrated feeds and roughage.

After Slovakia's accession to the EU, the policy of subsidies positively affected cattle breeding without the market production of milk. This breeding is important especially in areas in which landscape management for agricultural purposes is difficult. In 2010 as compared to 2004, the production of slaughter cattle in the EU-27 decreased by 4.6%. A similar decrease by 2.3% was recorded in the EU-15. In Slovakia, the production decreased by 22 thousand tons representing a decrease by 46.8% (Tab. 4). The number of cattle decreased by 13.5%. Slovakia's share in the total production of the EU-27 accounts for only 0.18%. EU-15 countries produce up to 91.9% of slaughter cattle. Poland is the biggest producer from the EU-12. All NMS are characterized by decreased production – only in Poland and Cyprus has production increased.

The breeding of pigs in Slovakia was affected by a strong decrease in their numbers, which could be related to their exclusion from EU subsidies. During the studied period of 2004–2010, there was a significant decrease in the number of pigs by 40.2% due to increased prices of feed,

Country, Grouping	2004	2005	2006	2007	2008	2009	2010	Average index	Change index 2010/2004	Decrease (in %)
EU-27	8,299	8,083	8,132	8,204	8,072	7,717	7,918	99.2	95.4	– 4.6
EU-15	7,446	7,270	7,299	7,334	7,227	7,066	7,273	99.6	97.7	– 2.3
Slovakia	**26**	**26**	**21**	**23**	**20**	**16**	**14**	**90.6**	**53.2**	**– 46.8**

Tab. 4: Development of slaughter cattle production (in thousand tons)
Sources: Eurostat Database, 2012; Buday et al., 2012

lower purchasing prices of meat, and cheaper imports from abroad. When comparing the years 2004 and 2010 in EU-27, we can see an increase by 1.6%. A similar situation is in EU-15 with an increase by 6.9%. During this period, Slovakia radically reduced production by 58.4%, representing a decrease by 96 thousand tons. Slovakia's share in the European production is only 0.31%. The EU-15 countries maintain levels of production of 86.5%. Among the NMS, a significant producer is Poland. A slight increase can be observed in Cyprus, while the other NMS are characterized by declining production levels.

The number of poultry in Slovakia did not record as much a decline as livestock. In 2004, there were 14 million poultry units and by 2010, the number declined by 5.8% to 13 million units. EU-15 as well as the whole European Union recorded an increase in production. The cause of production decrease in Slovakia is particularly the openness of the European market. Poultry is being imported mainly from Poland and Hungary. In Slovakia, the production decreased by 29% representing a decrease by 26 thousand tons. Slovakia's share in the production of EU-27 is about 0.58%. From the NMS, a slight increase in production was recorded in Poland, the Baltic countries, Greece, and the Czech Republic. The domestic production of poultry meat is impaired also by the policy of retail chains. They, in fact, prefer foreign suppliers who offer poultry for a price much lower than the price of Slovak producers.

Sheep and rams are the only type of livestock recording growth in Slovakia during the studied period, from 321 thousand units in 2004 to 394 thousand units in 2010. This increase was conditioned also by the gradual improvement of permanent grasslands, as well as by the support of animal husbandry on permanent grasslands from the EU. The breeding of goats is considered a complementary sector of livestock production in Slovakia, which is reflected in their numbers. In 2004, there were 39 thousand units in Slovakia, while in 2010 their number decreased to only 35 thousand units, which represents a decline by 9.5%.

8. Conclusions

Slovak agriculture is currently in a difficult economic situation occasioned by structural problems and the economic crisis, but also a failing market due to the existence of many externalities caused mainly by excessive market regulation which is influenced by the CAP of the EU. Using a subsidy support, CAP tries to keep agriculture viable even in the less developed regions of the EU, thereby ensuring the development of these regions and an adequate standard of living for their populations. Structural changes that have occurred in Slovak agriculture after its accession to the EU are reflected in a number of areas. As for the size and structure of the area of agricultural land in Slovakia, we recorded changes during the period of 2004–2010 which were associated with a decrease of agricultural land at the expense of an increase in built-up and other areas. The relatively high rate of arable land within agricultural lands in the regions of Slovakia calls for environmental actions focused on soil conservation, which is mainly reflected in the increase of permanent grasslands in these years.

When analysing changes in the development of agricultural land and its internal structure in the period from 2004 to 2010, using a synthetic change index, we recorded large decreases of agricultural land. Such large decreases, however, occurred in the type of landscape with a prevailing share of arable land. While observing the changes in the area of agricultural land as a single unit using the increase/decrease index, we can see small decreases of agricultural land in all types of landscapes. By using this indicator, we expressed the specific nature of the changes regarding increase or decrease, except for agricultural land and arable land, permanent crops, and permanent grasslands. The increase of agricultural land in the type of landscape with prevailing permanent grasslands was associated with the increase of permanent grasslands in this region. The loss of arable land in some regions of particular landscapes was influenced by the increase in permanent crops or permanent grasslands in these regions. A great decrease of arable land, however, can be seen in regions of the landscape type with prevailing permanent grasslands. The increase in the size of arable land in some regions in the landscape type with prevailing permanent grasslands was influenced by the loss of permanent grasslands in this type of landscape, as well as by the loss of permanent crops.

Agriculture is still one of the sectors of the economy which shows a reduction in labour force. In the educational structure of workers, change associated with an improving qualification structure of employees can be observed. An adverse phenomenon remains the insufficient inflow of young workers, thus increasing the proportion of employees in higher age categories. We do not expect an increased interest of young workers in this sector of the economy. During the study period, there was a decline of agricultural holdings including natural persons, and also cooperatives. On the other hand, because of the size of agricultural production, in addition to cooperatives, also limited liability companies (s.r.o.) are important and their numbers have significantly increased.

Slovakia's accession to the EU resulted in Slovak agriculture adapting to the Common Agricultural Policy of the EU and to the conditions of the Common Market. On the one hand, Slovak agriculture must be competitive in the Common Market area of the EU countries. On the other hand, there are not the same farming conditions in all EU countries, which is reflected in lower subsidies

from the EU to the NMS compared to the other older EU member states. Accession to the EU was reflected in higher expenses of the state for agriculture and caused a faster approach of agricultural prices to the level of prices in the EU. Disparities among the EU countries are reflected also in the results of management in Slovakia. During the studied period 2004–2010, there was a slight increase in gross agricultural production in Slovakia. Gross crop output also increased, and began to slightly dominate over gross animal output, which decreased during the study period. Animal output recorded a decrease in almost all species of livestock in Slovakia during the studied period. The most rapid decrease was in the number of pigs (– 40.2%), and cattle decreased by nearly 14% which is associated with the strong competitive environment of the EU countries and higher inputs into production. The most grown crops in Slovakia are cereals and oil seeds. In most of the main agricultural crops, we recorded decreased cropland areas except for oilseeds (increase by 34.2%) because of their use for energy purposes. The largest decrease was seen in potatoes (– 54.2%) and sugar beet (– 48.6%).

The CAP impact on the development of agricultural production since 2004 was different not only in the individual member states, but also in the groupings of EU-27, EU-15, NMS, and Slovakia. At current prices, we recorded an increase in gross agricultural production when comparing the years 2004 and 2010. The positive fact is an increased gross crop output in the groupings of the EU-27, EU-15, and Slovakia. Compared with the groupings of the EU-27 and EU-15, where gross animal output increased, Slovakia is characterized by a decline in this indicator.

All NMS, with the exception of Greece and Hungary, are characterized by increased gross agricultural production in the studied period. These two countries recorded also a decline in gross crop output. Only Slovakia and Bulgaria are characterized by a decline in livestock production. Other EU-27 countries recorded an increase in livestock production.

As for the development of monitored crops in the EU-27, EU-15, and Slovakia, we recorded a decline except for oilseed rape. Slovakia has also increased production of grain maize, but a significant decrease can be seen in the production of potatoes. As compared with the year 2004, EU-27 and EU-15 showed a decline in cattle and pigs, and an increase in poultry in 2010. Development in Slovakia in all monitored species of livestock is marked by a decline in production, namely in pig breeding. A negative feature of the development of Slovak agriculture in the period of accession to the EU is the reduction of food self-sufficiency, which is compensated by imports mainly of meat, as well as fruits and vegetables from the other EU countries. Slovakia, basically, produces only a sufficient amount of cereals. Moreover, Slovakia also exports cereals, grain maize, and oilseed rape.

Slovakia's accession to the EU has brought some stability to market conditions and the political environment. The CAP brought more competitiveness to agricultural holdings. The problems of the economic crisis, both on the domestic and foreign markets, is reflected also in the declining number of agricultural holdings. In market agriculture, greater holdings have success and they appear to be more stable. The strongly competitive environment of the European market has brought greater reliance of agricultural holdings on subsidies from their own countries, but also on the aid from the EU which is gradually increasing in the NMS. Only efficient and competitive agriculture will support the viability of the rural economy and will remain an important part of rural activities. The aim of the Europe 2020 strategy is mainly the support of the competitiveness of Slovak agriculture, sustainable management of natural resources, and economic development of rural areas.

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