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SOCIOECONOMIC FUNCTIONS OF AGRICULTURAL SECTOR IN THE REGIONS OF SLOVAK REPUBLIC

The paper focuses on the importance of agricultural sector and its socioeconomic functions in the regions of Slovakia. Despite the low share of agriculture in the creation of economic value and employment, it has its justification in the economic structure of the country as it generates in the result of supplier – customer relationships the multiplier effect on other sectors. Agriculture also performs several vital roles for the economic policy of the state, namely, in terms of population food security. Its economic function together with its social function are critical for the elimination of regional disparities.

Keywords: economic function of agriculture; social function of agriculture; agricultural employment; agricultural production.

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СОЦІАЛЬНО-ЕКОНОМІЧНІ ФУНКЦІЇ СІЛЬСЬКОГО ГОСПОДАРСТВА В РЕГІОНАХ СЛОВАЦЬКОЇ РЕСПУБЛІКИ

У статті обґрунтовано важливість сектору сільського господарства та його соціально-економічних функцій для регіонів Словаччини. Незважаючи на незначну частку сільського господарства у створенні економічної вартості та розвитку працевлаштування, воно виконує свою роль в економічній структурі національної економіки, оскільки в результаті відносин «постачальник – покупець» сільське господарство має мультиплікативний ефект на інші галузі. Детально описано принципово важливий вплив сільського господарства на економічну політику держави, зокрема, щодо забезпечення продуктової безпеки. Також продемонстровано, яким чином економічна та соціальна функції сільського господарства сприяють вирівнюванню регіональних дисбалансів.

Ключові слова: економічна функція сільського господарства; соціальна функція сільського господарства; працевлаштування в секторі сільського господарства; сільськогосподарське виробництво.

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СОЦИАЛЬНО-ЭКОНОМИЧЕСКИЕ ФУНКЦИИ СЕЛЬСКОГО ХОЗЯЙСТВА В РЕГИОНАХ СЛОВАЦКОЙ РЕСПУБЛИКИ

В статье обоснована важность сектора сельского хозяйства и его социально-экономических функций для регионов Словакии. Несмотря на незначительную долю сельского хозяйства в создании экономической стоимости и развитии трудоустройства, оно играет свою роль в экономической структуре национальной экономики, т.к. в результате отношений «поставщик – покупатель» сельское хозяйство имеет мультипликативный эффект на другие отрасли. Детально описано принципиально важное влияние сельского хозяйства на экономическую политику государства, в частности, на обеспечение продуктовой безопасности. Также показано, каким образом экономическая и социальная функции сельского хозяйства способствуют сглаживанию региональных дисбалансов.

Ключевые слова: экономическая функция сельского хозяйства; социальная функция сельского хозяйства; трудоустройство в секторе сельского хозяйства; сельскохозяйственное производство.

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Introduction. Agriculture is the foundation of human society's existence and development. With the improvement of science and technology alongside changing human needs, agriculture is not just limited to the traditional function of supplying agricultural products, but also carries many noneconomic functions, such as ecological function, and social one (Peng et al., 2015).

Various and sometimes conflicting expectations are often placed on agricultural production, such as ensuring food security, providing rural employment, producing organic and local food, protecting the environment and landscape, as well as strengthening the competitiveness of domestic production. These expectations are based on the society's values and norms, and reflect economic, social and environmental considerations. Achieving all the objectives simultaneously is challenging, especially when public resources allocated to agriculture are being reduced (European Commission, 2013).

According to M.P. Perring et al., (2012) in today's world, the function of agriculture is enriched because human demands have turned from the basic material to esthetic ones, including leisure, tourism, and other entertainment. Especially under such global threats to human development as environmental crises, energy crises, and food safety crises, people have begun to pay more attention to the ecological protection of agriculture.

Agriculture in Central Europe after the fall of the "Iron Curtain" at the end of the 1980s has been changing dramatically. Extensive changes in the intensity and structure of agricultural production were the result of transformation processes in the 1990s and the impact of the Common Agricultural Policy after the accession of Central European countries into the EU in 2004. One of the symptoms of the mentioned processes is an effort to link agriculture to rural development, so that both sectors do not contradict, but complement each other (Van der Ploeg et al., 2008). The result of structural changes has been a dramatic decline in the share of agriculture sector in GDP in the transition countries (Gubova and Ambrozyova, 2005).

T. Marsden and R. Sonino (2008) stated that for the achievement of the connection between agriculture and rural development necessary is diversification of agricultural incomes for the benefit of alternative activities (cultivation of alternative crops, organic farming etc.) or non-agricultural activities (agritourism, direct sales support and processing of agricultural products etc.).

Multifunctional concept of agriculture laid emphasis on its economic but also social and environmental aspects (Mura et al., 2015).

Depending on the quality of natural conditions, agricultural activities in various regions should take into account strengthening or weakening of individual aspects of multifunctionality. This means that, e.g., productive functions of agriculture have to be preserved and promoted in the areas with high fertile soils which can be used for food production, on the other hand, partial mountain conditions or marginal areas where soil quality is lower, can strengthen the environmental or social aspects of agricultural multifunctionality. Promotion of sustainable functions of agriculture in different regions in the context of their natural but also socioeconomic assumptions is a challenge where agricultural policy plays the crucial role (Wilson, 2009). Regions participating in agricultural production earning creation, have benefits from the appropriate primary income (in the sense, in which it is formed by the market).

Studying agricultural multifunctionality cannot only provide theoretical support for the construction of an agricultural system, but also offers a new way to solve the problem of weak and inefficient agricultural industry. Current study on agricultural multifunctionality includes both qualitative research and quantitative research (Ewert et al., 2011).

According to G.I. Gavier-Pizarro et al. (2012) agricultural function assessment is one of the key topics in quantitative multifunctionality research. It can be roughly divided into two categories: one focuses on some certain agricultural functions, such as ecological services, agricultural externality, biological diversity, social services and agricultural landscape, and the second one is agricultural integrated function assessment.

Agriculture makes its contribution to economic development in several ways: by providing food and raw materials to non-agricultural sectors of the economy; by creating demand for the goods produced in non-agricultural sectors, on side of rural people with their purchasing power, by providing investable surplus in the form of savings and taxes to be invested in non-agricultural sectors; by earning valuable exchange through agricultural export; by providing employment to vast quantities of uneducated, and unskilled labour. According to J. Peng et al. (2015) the economic function of the agricultural system is embodied in agricultural production outputs and recreational benefits. The former one means traditional economic benefits of cultivation, and the latter one reflects the new spiritual benefit of agriculture in a highly urbanized society. Agricultural production outputs which means the overall grain production capacity and its market value, can be quantified by both the indices of grain output per 1 ha of cultivated land and gross output value of agricultural products per 1 ha of cultivated land; and recreational benefits, which means the market value of tourism landscape in agriculture, can be expressed by the income ratio of agricultural sightseeing gardens for each assessing unit of county, compared with the whole city.

The concept of multifunctional agriculture within integrated rural development may help provide a solution for the able group of farmers. This process may occur along the tracks of "broadening", "deepening" or "re-grounding". The concept of "broadening" describes here the development of new non-agricultural activities. Such activities widen income flows of farm enterprises (Marsden, 2003).

Social farming is one type of broadening that includes:

- health therapy and healing;
- education;
- rehabilitation and other social activities.

Social farming (also known as "green care"/"care farming") is based on the recognition that working with animals, plants, soil and being in contact with the nature has special value for peoples' wellbeing. Across Europe, it is used as a service option for people with mental health difficulties, with disabilities (intellectual, physical or sensory), during drug/alcohol rehabilitation, prisoner rehabilitation, services for the elderly, therapeutic activities for children etc. (McGloin et al., 2013).

The aim of the paper is to evaluate the importance of social and economic functions of the agricultural sector in the regions of Slovakia. Partial aims of this paper are:

- evaluation of economic function and economic results of agricultural production and productivity in the agricultural sector;

- analysis of the social function of the agricultural sector in terms of employment;

- offering practical recommendations.

Methods and material. We have used the following scientific methods:

- *Cluster analysis* – was used for the purpose of classifying regions of Slovak Republic by their share of agriculture in GDP and employment. Cluster analysis is concerned with how objects (statistical units) are grouped so that the greatest possible similarity is within groups and while the greatest difference is between the groups. The method is based on a combination of several variables (Kriska, 2010). In this paper cluster analysis was realized through Neuro XL Clusterizer program.

- *Location analysis* – through the localization coefficient we analysed the importance of employment in agriculture of different regions of Slovakia. To calculate the localization coefficient the following relationship was used:

$$LQ = \frac{\frac{e_i}{E_i}}{\frac{e_t}{E_t}} \quad (1)$$

or alternatively in the form:

$$LQ = \frac{e_i}{E_i} \cdot \frac{E_t}{e_t} \quad (2)$$

e_i represents employment in the selected sectors and e_t overall employment in the region. Similarly, E_i represents employment in the selected sectors and E_t – the overall employment in the country. This simple formula implies that if the localization coefficient reaches a value greater than 1 for the selected sector in the considered region, there is specialization in the sector and therefore its production is exported to other regions. Otherwise, if the localization coefficient reaches a value less than 1, other regions' production of the sector is imported in the considered region (Hudec, 2008).

The data used for processing here were obtained from the following sources:

- Statistical Office of Slovak Republic – data is processed by regions (NUTS III level) in the Slovak Republic;

- book publications by domestic and foreign authors;

- Internet resources focused on employment analysis in agriculture;

- government regional policy documents related to agriculture.

Research results. Agriculture until 1990 was consolidated and ensured the employment for about 350,000 employees, which is 17% of all the employees in material production. In the creation of gross domestic product, agriculture accounted for 10.7%. Since 1990, the sector has changed a lot.

Slowdown of dynamics in economic growth was reflected in employment trends. Disposal of jobs due to transformation and restructuring processes has not been compensated by creating new jobs in other parts of the economy (Dubravská et al., 2015). High unemployment rate and low creation of new jobs are characteristic for the

whole economy. Despite a significant decline in employment, agriculture and forestry are still offering most jobs in some regions (Machova et al., 2015).

Based on the analysis of the situation of agricultural employment in the years 1989–2012 we can say that a breakthrough in the decreasing number of employees occurred in 2004. Until this period the number of employees in agriculture is declining steadily. In this period the reduction of employees stopped and the loss of employees due to their shift to the unemployed did not rise, because the loss was mostly natural (retirement). This decrease in employment has led to labour productivity growth.

According to experts from agricultural enterprises (Petrasova and Valach, 2011) the situation until 2003 was mainly caused by:

- lack of support for employment increase in the agricultural sector. Projects supporting agricultural enterprises were focused primarily on purchasing new equipment to enhance productivity and reduce the need for manual labour, diversification of activities in agriculture was not supported along with the growth of jobs. Agricultural enterprises were supported by the Rural Development Programme and according to the agreed rules, they were not eligible for any funding from ESF – the European Social Fund;
- purchasing of products from abroad by newly created chain stores rather than from domestic production leading consequently to employment decrease in the food industry;
- extensive development of forestry enterprises;
- mismanagement of agriculture transformations, namely, restructuring of cooperative property did not create conditions for the development of intensive agricultural production.

Decrease in the number of employees is graphically presented in Table 1. According to the Eurostat data, Slovak Republic belongs currently to the European countries with the largest decline in agricultural employment.

Table 1. Development of agricultural employment since 1989
(Green Report 2000, Statistical Office of the Slovak Republic, 2015)

Year	Number of employees in agriculture	Year	Number of employees in agriculture
1989	360699	2002	66727
1990	326660	2003	58892
1991	262602	2004	49938
1992	211594	2005	48362
1993	173711	2006	44630
1994	152755	2007	41723
1995	142911	2008	38370
1996	127751	2009	35023
1997	119084	2010	31685
1998	103578	2011	29856
1999	88994	2012	29847
2000	77332	2013	29722
2001	72067	2014	29720

Economic results of the agricultural sector in Slovak regions. Strong recovery of the economy in the 1990's led to an overall decrease in the importance of agriculture. Contribution of agriculture to GDP was 5.9% in 1993 and it fell to 2.7% in 2013.

Financial results of agricultural production for the year 2013 were different (Table 2). 3 of the 8 regions of Slovakia reached on average a positive economic result. Its highest level had Nitra region (43 EUR/ha), then goes Bratislava region (10 EUR/ha) and Trnava region (2 EUR/ha). Only one region of western Slovakia was unprofitable, and that was Trencin region, which showed the highest loss (-57 EUR/ha). All regions of Central and Eastern Slovakia had average losses. Economic results decreased annually in all the regions of Slovakia. The highest annual fall was in Kosice and in Bratislava region, which may not be due to enterprises in these regions, but due to tax allocation of the agricultural enterprises owners, farming outside these regions.

Table 2. Economic results in 2012 and 2013 of agricultural land, EUR/ha
(Research Institute of Agriculture and Food Economics)

Regions	2012	2013
Bratislava region	-73	10
Trnava region	55	2
Trencin region	-21	-57
Nitra region	97	43
Zilina region	-17	-26
Banska Bystrica region	10	-30
Presov region	0	-19
Kosice region	78	-17
Slovak Republic	34	-5

When comparing years 2012 and 2013 the level of production increased annually in Bratislava, Zilina and Presov regions (Table 3). Production above average of Slovakia reached Western Slovakia, the maximum volume was Bratislava region (1,820 EUR/ha agricultural land), where production on 1 ha was more than twice higher than in regions with prevailing less favourable natural conditions (Zilina, Presov and Kosice region).

Table 3. Agricultural production in 2012 and 2013 of agricultural land, EUR/ha
(Research Institute of Agriculture and Food Economics)

Regions	2012	2013
Bratislava region	1587	1820
Trnava region	1789	1787
Trencin region	1207	1197
Nitra region	1446	1431
Zilina region	670	717
Banska Bystrica region	796	743
Presov region	591	607
Kosice region	868	770
Slovak Republic	1128	1128

Labour productivity per one employee had different development trends when comparing 2012 and 2013. Annual increase was observed in Bratislava, Trencin, Nitra and Zilina regions. Bratislava region in the period under review reached 14.6% increase in labour productivity (Table 4).

Table 4. Labour productivity of production per employee in 2012 and 2013, EUR (Research Institute of Agriculture and Food Economics)

Regions	2012	2013
Bratislava region	56797	64451
Trnava region	58593	58235
Trencin region	37752	38661
Nitra region	59117	60066
Zilina region	28040	28903
Banska Bystrica region	40525	38259
Presov region	27946	26870
Kosice region	47600	41528
Slovak Republic	46851	46603

In the following section of paper we present the distribution of Slovak regions at NUTS III level according to the results of cluster analysis. Input data for cluster analysis were the data for the year 2013 by the following indicators:

- the share of agriculture in GDP;
- the share of agricultural employment in total employment;
- the research and development (R&D).

For analysis we used the values of the R&D indicator from (Cernakova, 2013). This composite indicator reflects two indicators – gross domestic expenditure on research and development and the number of R&D employees. According to (Cernakova, 2013) for the R&D indicator applies following:

- the value of the indicator $R\&D < 0.2$ – low level of knowledge creation;
- the indicator of R&D from 0.2 to 0.8 – medium level of knowledge creation;
- the value of the indicator $R\&D > 0.8$ – high level of knowledge creation.

Table 5 presents the results of cluster analysis. The first cluster consists of Nitra, Trnava and Banska Bystrica, which are characterized by high values of the used indicators, except R&D. Nitra region in 2013 reached the highest value of the share of agriculture in GDP (6.53%), and also the highest share of employment in agriculture (4.87%). In terms of the values of the R&D indicator Nitra region is characterized by low level of knowledge creation.

Table 5. Division of Slovak regions into clusters according to the values of the used indicators, authors' own calculations on the data from the (Statistical Office of Slovak Republic; Cernakova, 2013; program NeuroXL Clusterizer output)

Cluster	Cluster weight, %	Region	The share of agricultural employment, %	The share of agriculture in GDP, %	R&D
Cluster 1	0.375	Nitra region	4.87	6.53	0.11239
		Trnava region	4.73	5.75	0.09202
		Banska Bystrica region	3.97	3.76	0.10658
Cluster 2	0.5	Trencin region	2.65	2.71	0.20786
		Zilina region	2.81	1.47	0.13476
		Kosice region	2.45	2.24	0.23475
		Presov region	3.85	2.28	0.06701
Cluster 3	0.125	Bratislava region	0.57	0.62	1

The second cluster includes Trenčín, Žilina, Košice and Prešov regions. Within this group of regions the hugely highest share of employment in agriculture (3.85%) is in the Prešov region. Based on the indicator R&D, Trenčín and Košice regions had medium level of knowledge creation. The third cluster consists of Bratislava region which achieved the lowest share of agriculture in GDP (0.62%) among all the regions of Slovakia.

Based on the location analysis results presented in Table 6, we can state that agriculture is the most important exporting sector in Nitra region, which reaches the highest value of the localization quotient. The agricultural sector was also the exporting sector in Trnava, Banská Bystrica and Prešov regions.

Table 6. Localization coefficient of the agriculture sector in 2009–2013, authors' own calculations on the data from Statistical Office of the Slovak Republic

	2009	2010	2011	2012	2013
Bratislava region	0.25129	0.24867	0.22194	0.20149	0.19828
Trnava region	1.658477	1.71261	1.69855	1.71326	1.64619
Trenčín region	0.814249	0.85195	0.93112	1.01173	0.9219
Nitra region	1.962109	1.8867	1.86839	1.76321	1.69436
Žilina region	0.863008	0.82705	0.94225	0.8553	0.97797
Banská Bystrica region	1.284065	1.34811	1.2379	1.19896	1.38028
Prešov region	1.27821	1.25135	1.28961	1.28456	1.34048
Košice region	0.733183	0.73819	0.67758	0.89286	0.85388

The most common activity on the territory of the Nitra region is agriculture. Agriculturally, the region belongs to the most used ones in Slovak Republic. It has very good natural and climatic conditions for growing almost all crops. Therefore, the development of this region is closely connected with the development of productions but also with the social functions of agriculture on its territory. The need to increase the competitiveness of agricultural enterprises requires the implementation of innovations.

Agriculture, being tied to the land, creates conditions for the development of all the regions of Slovakia, allowing developing also the least developed regions. Therefore, the first task is to ensure the use of land in the ways useful for the area in terms of both production and ecology.

Conclusions and proposals. While in the previous period, the priority was to ensure economic growth and focus was on continual production increase without taking into account the possibility of production capabilities of the country or a particular region, currently economic activities are limited by the requirements of sustainable development.

Despite the low share of agriculture in the creation of economic value and employment it has its role in the economic structure of the country as it generates the multiplier effect for other sectors. Per one employee in agriculture there are 1.3 employees in the supply industry, services, manufacturing and trade, and this increases agriculture's participation in GDP. Diversification of production structure of agricultural enterprises valorises the unique potential of rural settlements and contributes to the development of social function of agriculture by creation of new job opportunities for local residents.

Economic and social functions of agriculture are critical from the point of view of mitigation regional disparities. In the past, these functions should have ensured equal conditions for all; today these functions are modified and oriented rather to smooth economic and social disparities between regions and between urban and rural areas which are still characterized by unequal productivity and unequal economic developments. Modified alternative forms of agricultural production can ensure strengthening of the effect of production functions, profit-making and more efficient production processes.

To increase competitiveness, sustainability, economic and innovative performance it is required:

- to place greater emphasis on promoting the interests of Slovak farmers in decision-making and governing bodies of the European Union;
- to activate the potential of local resources use. Rural areas have a lot of problems which agricultural enterprises could help solving through diversification of activities. In the old EU the Member States help farmers solve the lack of services for growing population of post-productive population in rural areas, problems with marginalized population groups (women with children, physically and mentally disabled people) through the so-called "green care" farming;
- to focus on support for direct sales of agricultural products. Due to this agricultural producers can get larger shares of added value from the final product and achieve higher trade margin;
- to support cooperation and partnerships between self-government and agricultural enterprises which can effectively solve waste management problems, through the use of local renewable natural resources able to supply energy to other subjects in a municipality.

Rural development policy should respect greater diversity of rural environment in Slovakia and peculiarities of individual regions. This requires detailed knowledge of the problems in individual regions. In some EU Member States (Italy, Germany, and France) rural development policy is delegated to the regional level. Regional authorities are better at recognizing local development problems, they are able to specifically identify problems of their territory. It is for consideration whether in Slovak conditions the decentralized model of rural development policy tools implementation would be more effective or not.

As another option of development and strengthening of social function and economic result in the agricultural sector in Slovakia we propose the creation of conditions for emergence of the so-called "green care farms" based on "care farming", which have long tradition in several European countries (UK, Netherlands, Italy, Belgium etc.).

"Green care farming" represents the concept which use farms, agricultural works, animals and plants to improve quality of life and human health. It is the use of labour in agriculture for therapeutic purposes and provisions of social respectively health area. The target groups of this concept may include: people with mental disabilities, people with psychiatric disabilities, people with mobility disabilities, pensioners, problematic youth (people who have problems with stress, were taking addictive drugs or committed a crime), and children with hyperactivity, attention deficit disorder etc.

This innovative approach combines two concepts: multifunctional agriculture, and social services/health care at the local level. It contributes to the increase of employment, diversification and economic performance of farms, as well as to promotion of overall sustainable development.

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