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Time schedule of the conference

Preparation of the proceedings and organization: October 2015 – April 2016

Conference: 21-22 April 2016

Researchers from the following higher education institutions, research institutions, and professional organizations presented their scientific papers at the conference:

Aleksandras Stulginskis University	Lithuania
BA School of Business and Finance	Latvia
Belgorod National Research University	Russia
College of Agriculture at Križevci	Croatia
Corvinus University of Budapest	Hungary
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Kaunas University of Applied Sciences	Lithuania
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Pennsylvania State University, State College	USA
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Riga International School of Economics and Business Administration	Latvia
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University of Warmia and Mazury	Poland
UTP University of Science and Technology	Poland
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The authors are responsible for the content and language of their papers.

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Every article included into the Proceedings was subjected to a scientific, including international review.

All reviewers were anonymous for the authors of the articles.

The following 128 reviewers from scientific and academic institutions of 15 countries (Croatia, Cyprus, Czech, Estonia, Hungary, Italy, Latvia, Lithuania, Montenegro, Poland, Russia, Slovakia, Turkey, Ukraine, USA) have written 128 reviews.

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It is necessary to agree upon standards of expected ethical behaviour for all parties involved in the act of publishing: the author, the editor, the peer reviewer, and the publisher.

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The international scientific conference "Economic Science for Rural Development" is organized annually by the Faculty of Economics and Social Development of Latvia University of Agriculture.

The proceedings of the conference are published since 2000.

The scientific papers presented in the conference held on 21-22 April 2016 are published in 3 thematic volumes:

No 41 Rural Development and Entrepreneurship
Bioeconomy
Home Economics

No 42 Integrated and Sustainable Regional Development
Production and Co-operation in Agriculture

No 43 New Dimensions in the Development of Society
Marketing and Sustainable Consumption
Finance and Taxes

The proceedings contain scientific papers representing not only the science of economics in the diversity of its sub-branches, but also other social sciences (sociology, political science), thus confirming inter-disciplinary development of the contemporary social science.

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The Conference Committee and Editorial Board are open to comments and recommendations concerning the preparation of future conference proceedings and organisation of the conference.

Acknowledgements

The Conference Committee and editorial Board are open to comments and recommendations for the development of future conference proceedings and organisation of international scientific conferences.

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On behalf of the conference organisers

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RURAL DEVELOPMENT AND ENTREPRENEURSHIP

STABILITY EVALUATION OF THE NUMBER OF FARMERS FARMS AND DECLARED AGRICULTURAL LAND IN LITHUANIA

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Abstract. The beginning of the restitutorial land reallocation reform in 1991 brought a rapid change in agricultural land utilisation and user groups resulting in the decrease of state land users' categories and the growth of private agricultural land areas used by farmers and other natural and legal entities. The aim of the article is to analyse the stability of farmers farms and their agricultural areas in Lithuania during the period between 2009 and 2014. The research estimates the stability of the number of farms and the utilised agricultural area in separate Lithuanian administrative units, i.e. municipalities. The survey results revealed that the most stable farmers' land holdings group was farms that utilised more than 10 ha of agricultural land. The number of farms stability coefficient in Lithuania is 1.08 on average. The complex index of the stability of the utilised agricultural area in Lithuania is 1.13 on average. The value of index is the lowest only in 8 of the 51 municipalities in Lithuania, i.e. from 1.00 to 1.09. This means that the farm land use in those districts is the most stable since the municipality has no possibilities to increase it significantly by ploughing up or otherwise using the abandoned and fallow land.

Key words: land used for agricultural purposes, farmers farms, used and declared agricultural land, farm size, stability.

JEL code:

Introduction

The agricultural sector in Lithuania has very important economic, social, environmental and ethno-cultural value and is considered to be a priority branch of the national economy. Lithuania should implement agricultural economic policies in order to create favourable conditions for farming and compete effectively on the EU single market. Successful activity of farms is heavily dependent on primary factors of production – rational utilisation of land, labour and capital. Larger areas of owned land do not necessarily show an increase in the production of income as higher income can be expected if additional land areas enable efficient use of agricultural machinery and labour. Higher income can also be received due to specialisation. However, the EU's main agricultural development trend is still holding pieces of consolidation of agricultural units. As demonstrated by the experience of other countries, this is happening at the expense of small farms since the number of small farms is declining and the number of medium-sized farms is growing.

Since the beginning of land reform in independent Lithuania in 1997, the existing

practice has been to design only land plots rather than farms as the latter were required by law to be registered as land territorial units. This resulted in the decline of land plot size and the scatter of these plots. Since the formation of the farm land holdings was left to chance, the restructuring of the layout of the plots faced the repeated land management works during the preparation of land consolidation projects.

At present, indicators characterising agricultural land management and use in Lithuania are still associated with the ongoing land reform – the restoration of the ownership of land and public land sales as well as with the development of farm land holdings, when acquiring and leasing of the land owned by other landowners. Land reform process especially had impact on the changes of agricultural land structure according to users. The number of farmers is increasing, while the number of agricultural companies and other agricultural enterprises and their controlled land is decreasing (Valčiukienė, 2015).

A number of Lithuanian and foreign scientists (Aleknavičius, 2007; Makutenienė, 2004; Abalikstienė, Stravinskiene 2011; Marsden et al.,

2008; Hazell et al., 2010; Davidova et al., 2013; Silva et al., 2014; Graeb et al., 2015 and others) analysed the change of agricultural land and agricultural land areas as well as the change in the size of farms, land use peculiarities.

When analysing the use of land resources in Lithuanian farmers farms, Z. Kazakevicius (2011) states that despite the fact that the variable cost productivity and profitability has declined, the use of agricultural lands in farmers farms is improving.

P. Aleknavicius et al. (2012) also analysed agricultural land conversion works carried out in the independent Lithuania. In order to create favourable conditions for agricultural land users, it is recommended to improve agricultural policies and laws, providing for support for farmers to purchase the land within the boundaries of their prospective land use and to start using the abandoned land.

The research aim – to analyse the stability of farmers farms and their agricultural areas in Lithuania during the period between 2009 and 2014.

The following tasks were raised for the achievement of the aim:

- 1) to analyse the variation trends of farmers farms as well as used and declared agricultural land in Lithuania;
- 2) to perform the stability assessment of the number of farms, their use and declared agricultural land in individual Lithuanian administrative units – the municipalities of the districts.

The scientific literature and legal documents, analysis and synthesis, statistical indicators and analysis of mathematical processing as well as comparative analysis were used for the implementation of the above mentioned aim and tasks. The obtained results were processed by GIS technologies. The study was conducted using the data from the Department of Statistics, the National Land Service under the Ministry of Agriculture and Lithuanian Agricultural

Information and Rural Business Centre within the period of 2009-2014. In assessing variation trends of agricultural land area used by agricultural entities the authors took into consideration the fact that the available information of both the Department of Statistics as well as information obtained from the analysis of the areas declared, did not fully reflect the real situation.

The stability assessment of the number of farmers farms and the utilised and declared agricultural area of the country's territory were analysed assuming that only the constantly used territory and territorially related farming land areas (hereinafter - agricultural land areas) of sufficient size ensured the economic stability of the farm. To achieve this, the authors carried out the statistical analysis of the indicators of all municipalities of the Republic of Lithuania. The studies used indicators reflecting the stability of farm land use (utilised agricultural land area change, farm size changes). Land use stability was expressed as indices - coefficients indicating the degree of deviation. The coefficient value of the most stable studied phenomena is 1.

Research results and discussion

Indicators characterising agricultural land management and utilisation are related to an ongoing land reform – the restoration of the ownership of the land and public land sales as well as the development of farm land holdings, acquiring and leasing of the property of other landowners. In 2014, Lithuania had about 500 thousand hectares of state-owned agricultural land that could be privatized or used for farming (excluding land used by state-owned enterprises, scientific and educational institutions as well as state-owned land used by land and gardeners' communities as well as about 25 thousand hectares of forests situated in the state-owned agricultural lands).

The increase of private land area results in the increase of land owners number. However, land area per one owner - physical person remains

roughly the same: 5-6 hectares (Table 1). In addition, the land holding of one owner comprises two plots of land on average - real estate cadastre and registry units. It can be explained by the fact that the property rights are

restored to the smaller portions of the land area belonging to the candidates as well as the fact that the privatized individual agricultural land holding is no more than 2-3 ha.

Table 1

Variation of the number of agricultural land owners and the private land holding area in Lithuania

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Physical persons						
Number of owners	551768	563991	569795	573431	575847	577471
Private land area, ha	2877415	2927267	2965801	3017532	3086774	3167945
Per owner, ha	5.2	5.2	5.2	5.3	5.4	5.5

Source: the data of the State Enterprise Centre of Registers

During the analysis of farms, the development of the formation of agricultural entities' farms is more important than the variation of the number of landowners. The data of Lithuanian Agricultural Information and Rural Business Centre indicates that according to the agricultural land area declared by all agricultural land entities in 2013, the average farm size in Lithuania was 18.5 ha, i.e. by 5.7 % higher than in 2012, and by 23.3 % higher than in 2009. In 2013, there are 5.3 % fewer farms declared by agricultural entities in comparison with the year 2012, the declared area increased slightly by 0.2 %. Although in 2013, as in the previous years, the farms up to 5 ha amounted to more than 50 % of all farms with declared land use, in 2013 their number decreased by 7.4 %. Compared to 2009, the number of these farms decreased by 18.0 thousand, or 19.0 %. The group of farms of 5.1-10 ha is decreasing every year. Over the analysed period the number of the farms of this group fell by 14.5 %, however the structure part

has changed only slightly. Compared to 2009, in 2013 the number of farms in both groups from 10.1 to 20 ha and from 20.1 to 50 ha decreased by 12.4 and 7.8 %. However, the groups' share in the structure of farms increased only slightly. During the analysed period, the number of farms in farm groups of 50.1 to 100 ha and 100.1 to 500 ha has increased by 15.2 % and 34.4 % respectively. In the largest group of farms – of more than 500 hectares – the number of farms and their part of the structure during 2009-2013 has changed slightly. Farm size variation is affected by the fact that farms have the opportunity to increase their used land by cultivating derelict and abandoned former land use areas. During the implementation of the Lithuanian Rural Development Programme 2007-2013 of the financial assistance and other conditions for the economic development, the total declared agricultural land area of farm holdings increased up to 2,836.6 thousand ha in 2014 or slightly more than 7 % (Table 2).

Table 2

The change of agricultural land use area in Lithuania, thou. ha

Indicators	Year					
	2009	2010	2011	2012	2013	2014
Declared area	2648.2	2687.3	2736.5	2784.3	2803.2	2836.6
Increase over a year	+39.1	+49.2	+47.8	+18.9	+33.4	+23.7

Source: data of Agricultural Information and Rural Business Centre

One of the most important indicators characterizing the relatively largest land user group - farmers, is the change in number, average size and utilized land area and average size (Table 3).

Table 3

The increase of the number of farms registered in the farmers farms register and the declared land area in Lithuania

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Number of farms (all farms)	108312	107308	109184	111742	114626	117457
Utilised (declared) agricultural area, ha	2005865	2053547	2125484	2197308	2293084	2359468
Average farm size, ha	18.5	19.1	19.5	19.4	20.0	20.1

Source: data of the State Enterprise Centre of Registers

According to the data provided, all three indicators tend to increase. In 2009 - 2014 the number of farms increased by 8.4 %, the area of utilised and declared agricultural land – by 17.6 %, while in 2014 the average declared farmland farm size in Lithuania increased by 8.6 % and was 20.1 ha.

From a specified number of registered farms one should single out small-scale farms, which could be economically viable only in a narrow specialisation and intensive production. However, as seen in Table 4, during the analysed period the number of such farms experienced the most

rapid growth in Lithuania. It should be noted that the number of very small farms (0-3 ha) increased in suburban areas adjacent to major Lithuanian cities during the period of 2009-2014: in Vilnius district – from 2382 to 3297; in Kaunas district – from 1267 to 1750; in Klaipeda district – from 1555 to 1849; in Trakai district – from 836 to 1259. It can be assumed that a substantial proportion of such farms were created in order to acquire the right to build a dwelling house (the so-called "farmstead") on land plot owned in rural area however real economic activity is not available on such farms.

Table 4

The growth of the number of farmers farms in Lithuania according to their area

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Number of farms up to 3 ha	26200	27023	28249	29678	31153	32737
Percentage compared to January 1, 2004	294.1	303.4	317.1	333.2	349.7	367.5
Number of farms of 3-10 ha	39718	38645	38886	39758	40577	41783
Percentage compared to January 1, 2004	160.9	156.6	157.6	161.1	164.4	169.3
Number of farms >than 10 ha	42394	41640	42049	42306	42896	42937
Percentage compared to January 1, 2004	161.9	159.0	160.6	161.6	163.8	164.0

Source: data of the State Enterprise Centre of Registers

As shown in Table 4, the most stable farmers' land holdings group is farms that use more than 10 ha of agricultural land: their number during the period of 2009-2014 increased by only 7.9 %. These farms make up 36.5 % of all farms

and only 7.8 % from all land owners – physical persons. However, this is the promising group of farms, from which the authors can judge about the farms land use stability.

According to the aggregated statistical data of the agricultural land declaration disclosed by the Agricultural Information and Rural Business Centre, in 2014 medium and large farms in terms

of size and the declared land areas as follows: 84 % of land is used by personal holdings, 16 % – by holdings of legal persons (Table 5).

Table 5

**Farms larger than 10 ha and agricultural land used by them in 2014
(aggregated data of agricultural land and crop declaration)**

Interval of declared area, ha	Farms of physical persons			Farms of legal persons		
	number of applications	land area, ha	per 1 farm, ha	number of applications	land area, ha	per 1 farm, ha
10.01 – 50	30624	630929	20.6	182	4741	26.0
50.01 – 100	5154	358493	69.6	106	7517	70.9
100.01 – 200	2862	395325	138.1	87	12258	140.9
200.01 – 300	886	215408	243.1	66	15773	239.0
300.01 – 400	388	133390	343.8	36	12339	342.8
400.01 – 500	193	86188	446.6	36	16021	450.0
More than 500	270	214767	795.4	232	321030	1383.8
Total:	40377	2034500	50.4	745	386679	519.0

Source: data of the State Agricultural Information and Rural Business Centre

Another indicator of farm viability, is the alterations of land area acquired to ownership. The larger part of the owned agricultural land area shows the increasing agricultural land holding stability and an opportunity to plan long-term investments in agricultural production development. However, the basic indicator of the investigation is the farm area of the utilised land rather than the possession of owned land. Geographically uneven land utilisation conditions (natural, economic etc.) of the country were taken into account, thus the peculiarities of farm land utilisation stability were examined in detail, by identifying municipalities, stability of the number of utilised and declared land use area as well as farms.

Utilised and declared agricultural area stability. In 2014, the declared area of agricultural land in Lithuania amounted to 2846.6 thousand ha, of which non-agricultural areas used for the cultivation of plants amounted to 33.4 thousand hectares, agricultural area used for the cultivation of plants (including fallow) amounted to 2813.3 thousand ha. According to the data prepared by the State Land Fund

records of the state enterprise State Land Fund of the Republic of Lithuania, by January 1, 2015 there were 3,467.6 thousand ha of agricultural land throughout the country. The study excludes agricultural land situated in forestry, water treatment, conservation and land for other purposes from the area i.e. a total of 105.7 thousand ha (the used data is prepared by the country's land fund public accounting data of the State Enterprise Centre of Registers on 01/01/2014). The difference – agricultural land possible to use for farming in the land used for agricultural purposes consists of 3,361.9 thousand ha. The ratio of the utilised agricultural land area with this statistical area in Lithuania ($2813.3:3361.9$) = 83.7 %. In separate municipalities, this percentage ranges from 41.0 to 100.0. The land use stability coefficient $K_1 = 1 \pm [(S_1 - S_2): S_1]$ is estimated according to this percentage, where S_1 agricultural land area situated in the land used for agricultural purposes by January 1, 2015, S_2 land use area declared on 2014, utilised for agricultural activities. In Lithuania the average value of $K_1 = 1.16$. The lowest value of K_1 (from 1.00

to 1.09) was determined in Joniskis, Sakiai, Kėdainiai, Kretinga, Marijampole, Birzai, Šiauliai, Panevezys, Radviliskis, Silalė and Mazeikiai districts (Figure 1).

In Lithuania, the changes of all declared agricultural land plots used for agricultural activities amounted to + 141.4 thousand ha (from 2792.0 to 2650.6) or 5.3 % in the period of 2009-2014. In separate municipalities, this percentage ranges from 0 to 60. The stability coefficient of the total of utilised agricultural land area K_2 was calculated using the following formula: $K_2 = 1 \pm [(S_2 - S_3) : S_3]$, where S_2 - land use area declared on 2014 utilised for agricultural activity, S_3 - land area declared in 2009 used for agricultural activity and situated in the land used for agricultural purposes. In Lithuania the average value of $K_2 = 1.06$. The minimum value of the coefficient K_2 (from 1.00 to 1.01) was determined in Kelme, Marijampole,

Panevezys, Mazeikiai and Jurbarkas districts (Figure 1).

Meanwhile in Lithuania, the changes in the agricultural land areas utilised and declared by farmers farms for the period 2009-2014, amounted to + 35.4 thousand hectares (from 2359.5 to 2005.9), or increased by 17.6 %. In separate municipalities, this percentage ranges from 13 to 40. The stability coefficient K_3 of the utilised agricultural area in farmers farms was calculated by the following formula: $K_3 = 1 \pm [(S_5 - S_4) : S_4]$, where S_5 - land use area declared in 2014 utilised for agricultural activity in farmers farms, S_4 - land use area declared in 2009 utilised for agricultural activity in farmers farms. In Lithuania the average value of $K_3 = 1.18$. The minimum value of the coefficient K_3 (from 1.03 to 1.09) was found in Kalvarija, Marijampole, Akmenė, Joniskis, Pakruojis, Raseiniai, Kazlu Rūda Sakiai, Vilkauskis and Birzai districts (Figure 1).

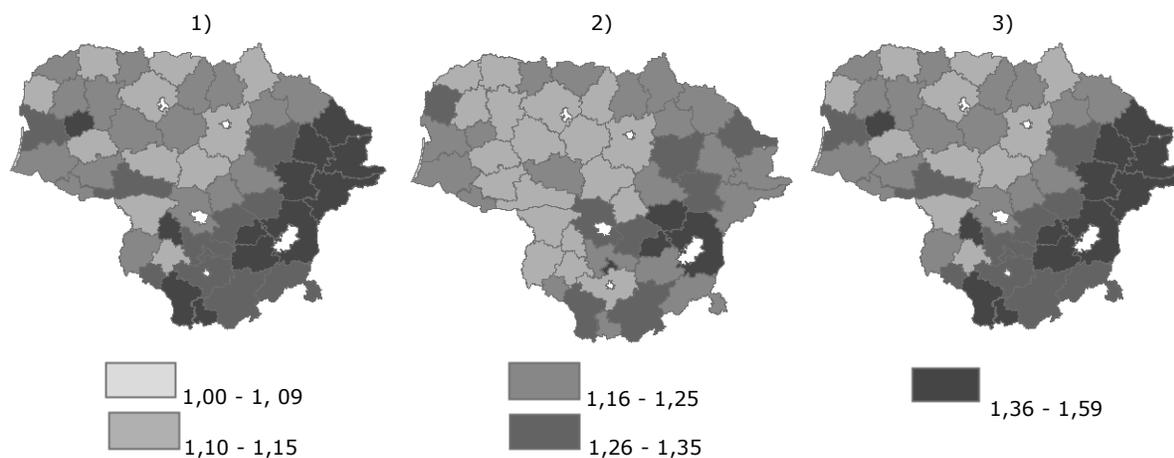


Fig.1. 1) Land use stability coefficient K_1 ; 2) Stability coefficient of all utilised agricultural area K_2 ; 3) Stability coefficient K_3 of the utilised land use area in farmers farms

The complex index of the stability of the utilised land use area was calculated as the mean of the sum of all three coefficients: $K_S = [(K_1 + K_2 + K_3) : 3]$. In Lithuania the average value of $K_S = 1.13$. The lowest value of the

coefficient K_S (from 1.00 to 1.09) showed Joniskis, Marijampole, Sakiai, Kėdainiai, Birzai, Raseiniai, Akmenė and Vilkauskis districts (Figure 2).

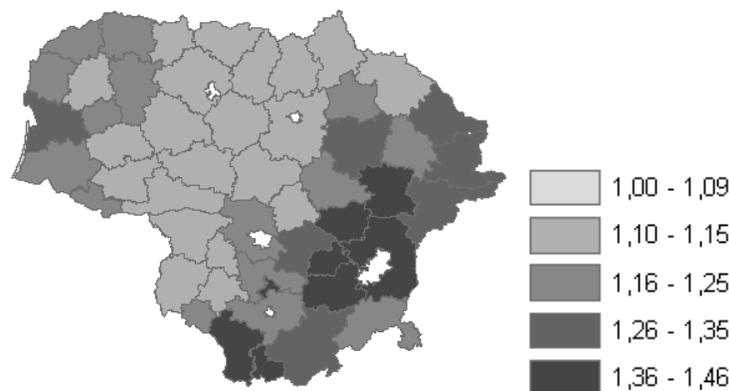


Fig. 2. **The stability complex indicator of the utilised agricultural area, K_S**

According to the study results, higher percentage of undeclared agricultural land directly correlates with a more unstable land use of farms situated in the territory of the municipality due to the possibilities to increase them by cultivating fallow or other undeclared areas. The most stable land use is in the municipalities where the declared area of agricultural land is close to the area specified in the land fund accounts. Also, the smaller changes of agricultural areas used in land use and declared by total agricultural entities indicate more stable land use of farms since it can be stated that the municipality has no possibilities to

increase them significantly by ploughing up or otherwise using the abandoned and fallow lands.

Stability of the number of farms. The data for estimation regarding the number of farmers farms registered in Lithuanian municipalities and their utilised (declared) land use area were determined according to the Lithuanian state land fund accounting data (for the state of 1 January) annually published by the State Enterprise Centre of Registers (until 2014, inclusively). The data on the changes in the number of farms according to their size in Lithuania during the 5-year period are presented in Table 6.

Table 6

Variation of the number of registered farmers farms in terms of their size

Indicators	Agricultural land area, ha	Number of farmers farms		Difference	
		In 2009	In 2014	unit	percentage
Large and small farms	0 – 10	65918	74520	+8602	13.0
Medium-sized and large farms	> 10	42394	42937	+543	1.3
Total	x	108312	117457	+9145	8.4

The data of the analysis indicate that the number of functioning, i.e. economically viable medium-size and large farms in Lithuania is more or less constant compared to small farms, whose reasons of intensive number increase have already been discussed. The number of farms stability factor $K_U = K_4$ was calculated by the following formula: $K_4 = 1 \pm [(U_2 - U_1) : U_1]$, where U_1 - the number of farms that use more

than 10 hectares of farmland in 2009. U_2 - the relevant number of such farms in 2014. In Lithuania the average value of $K_4 = 1.08$. The minimum value of coefficient K_4 (from 1.00 to 1.02) showed Birštonas, Jonava, Kaunas, Klaipėda, Kazlu Rūda Akmene, Rokiskis, Kedainiai, Prienai, Skuodas, Silute, Pasvalys, Jurbarkas, Silalė, Rietavas and Moletai districts (Figure 3).

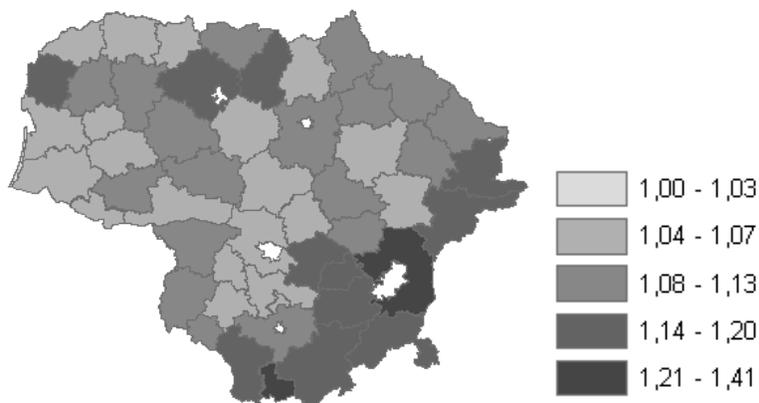


Fig. 3. **Stability coefficient of the number of farms KU**

Rational farm size varies due to a number of conditions. The maximum profit is the most important goal of the market economy but no less important is farm stability. Therefore, it is important to develop a farm business, which has a long-term perspective. The most stable ones are large family farms that employ diligent and skilled members of the family as family members are more motivated to achieve good results.

Conclusions, proposals, recommendations

1) Private land areas in Lithuania are tendentially increasing resulting in the increase of the number of land owners. One owner – a physical person owns land holding area of 5-6 hectares, which are often scattered over by two plots of land on average. In this period, the number of farms in Lithuania increased by 8.4 %, the number of small farms having increased the most (particularly in peri-urban areas) and the number of medium-sized and large farms did not change significantly. In Lithuania, the average declared size of farmland farm increased by more than 2 hectares (or 8.6 %) during the analysed period and currently consists of about 20.1 ha.

2) During the analysed period, land use areas declared in Lithuania increased even by 17.6 %. It is assumed that it was influenced by the financial support of measures of Rural Development Programme 2007-2013 and the timely implementation of the other conditions

for the development of farm economy. The stability complex index of the utilised land use area in Lithuania is 1.13 on average. The value of this index is very low, i.e. from 1.00 to 1.09, only in 8 of the 51 municipalities in Lithuania. This means that in those areas farm land use is the most stable since the municipality has no possibilities to increase it significantly by ploughing up or otherwise using the abandoned and fallow land.

3) The number of functioning, i.e. economically viable medium-size and large holdings in Lithuania during the analysed period is more or less constant. The most stable farmers' land holdings group is households that use more than 10 hectares of agricultural land. In Lithuania, the average stability coefficient of the number of holdings is 1.08.

4) Survey results suggest that successful competition in agriculture may be ensured by land consolidation, whereas the preparation of rural development land management projects is also recommended so as to transform agricultural land holding and guarantee the rational use of agricultural land: to form farming land plots having similar characteristics and determine their recommended use (composition of the planned agricultural crops and crop rotations) with regard to economic policy and environmental protection requirements as well as to identify other land management

measures required for the functioning of the farm. The competitiveness of the farm largely

depends on state subsidies and the EU support as well.

Bibliography

1. Abalikstiene, E., Stravinskiene, V. (2011). *Land Use Analysis in Southeastern Lithuania. Rural Development: Proceedings of the International Scientific Conference*, pp. 372-377.
2. Aleknavicius, P. (2007). Kaimiskuju teritoriju zemes naudojimo problemos: Zemes ukio mokslai (Problems of Rural Land Usage: Agricultural sciences). *Lietuvos mokslu akademija (Lithuanian Academy of Sciences)*, Volume 1, pp. 84-90.
3. Aleknavicius, P., Aleknavicius, A., Jukneliene, D. (2012) Lietuvos žemės ūkio paskirties žemės naudojimo perspektyvos (Prospective of Agricultural Land Utilisation in Lithuania). *Kaimo raidos kryptys žinių visuomenėje (Rural Development Trends in Knowledge Society)* Volume 4, Issue 2, pp. 15-26.
4. Benjamin, E., Graeub, M., Chappell, J., Wittman, H., Bezner, R., Samuel, L., Gemmill-Herren, B., (2015). The State of Family Farms in the World. World Development. Food and Agriculture Organization of the United Nations. Retrieved: http://ac.els-cdn.com/S0305750X15001217/1-s2.0-S0305750X15001217main.pdf?_tid=b7300a34-b466-11e5-b437. Access: 20.12.2015.
5. Davidova, S., Thomson, K. (2013). Family Farming: A Europe and Central Asia Perspective. Retrieved: www.fao.org/fileadmin/user_upload/Europe/documents/Events_2013/FF_EU. Access: 19.12.2015
6. Hazell, P., Poulton, C., Wiggins, S., & Dorward, A. (2010). The Future of Small Farms: Trajectories and Policy Priorities. *World Development*, Volume 10, Issue 38, pp. 1349-1361.
7. Kazakevicius, Z. (2011). Zemes istekliu naudojimo Lietuvos ukininku ukiuose vertinimas (Assessment of Utilisation of Land Resources in Lithuanian Farmers Farms). *Management Theory and Studies for Rural business and Infrastructure Development*, Volume 27, Issue 3.
8. Land Fund of the Republic of Lithuania, January 1 of 2009-2014. National Land Service under the Ministry of Agriculture of the Republic of Lithuania, State Institution Centre of Registers – Vilnius.
9. Makuteniene, D. (2004). Zemes naudojimo intensyvumo priklausomybe nuo ukininku ukiu dydzio Lietuvoje (Land Use Intensity Dependence on the Size of Farmers Farms in Lithuania) . Vagos: LZUU mokslo darbai, Volume 18, Issue 65, pp.60-69.
10. Marsden, T., Sonnino R., (2008). Rural Development and There Regional State: Denying Multifunctional Agriculture in the UK. *Journal of Rural Studies*, Volume 24, pp. 422-431, Retrieved: <http://www.swslim.org.uk/documents/themes/LT17-rural-development-regional-state.pdf>. Access: 19.12.2015.
11. Silva, Jose Graziano da (2014). *The Family Farming Revolution*. Retrieved: <http://www.fao.org/about/whoweare/directorgen/faodgopinionarticles/detail/en/c/212364/>. Access: 19.12.2015.
12. Valciukiene, J., Atkoceviene, V. (2015). *The Change of Land Users in Lithuania during the Period between 1920 and 2014*. Rural Development: Proceedings of the international Scientific Conference.

NETWORKING AS A FORM OF COLLABORATION OF LOCAL ENTREPRENEURS IN POLAND

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Abstract. The theoretical part of this thesis presents the essence and term of networking in a contemporary economy. The empirical part is based on data from the Polish Agency for Enterprise Development. The data analysis led to the conclusion that Polish entrepreneurs are deeply aware of the need to keep long-lasting relationships with customers as well as suppliers and business partners. What is more, respondents were eager to share the information on networking meetings with other entrepreneurs, which can later result in collaboration. Entrepreneurs were willing to tackle the topics connected with both direct financial benefits and an indirect influence on their companies' profits (soft skills).

Key words: networking, collaboration, entrepreneurship, local, Poland.

JEL code: R11

Introduction

In a contemporary economy, one can notice increasingly sophisticated connections and relations between various economic entities (Rokicki T., 2013). Considering a given area as a business one, it can be assumed that they are self-sufficient organizations. Therefore, gaining the factors that contribute to their development should result from an internal power (potential) of a given region or town (Makiela Z., 2013). Yet, it seems that the reality is slightly different. It is necessary to realize that in the structure of the world system, regions competitiveness is not based on the traditional allocation effectiveness any longer but on the adaptation effectiveness, which consists in taking various forms of activity coordination, generally called networking (Miszczak K., 2012).

Innovative and entrepreneurial regions have modern organization management methods, they are distinguished by huge self-dependence and speed in taking decisions, and they enter into alliances to carry out various projects. Such regions are perceived as modern elements of the European networking structure, and their essential role is to establish contacts with new partners. This mainly results from the fast changes and increasing sophistication of the environment, which considerably limits the autonomy of single companies, towns, regions, and countries. It is more and more often connected to searching for sources of competitive

advantage outside internal borders, which the literature refers to as a networking approach.

Taking into account the extent of reasons and consequences of the latest changes in company management, it is necessary to narrow the discussion on this issue.

That is why the article was to assess networking meetings of entrepreneurs whose companies were located in the capital of Poland – Warsaw. This survey was conducted by the Polish Agency for Enterprise Development in two stages from September 2012 to October 2014 and it covered 6 quarters of Warsaw (Ochota, Wola, Praga-Poludnie, Targowek, Ursynow, and Wilanow). The research task was identifying entrepreneurs' approach to establishing business relations, in other words, what benefits and barriers connected to networking they saw. It was done by means of the method of diagnostic survey with the use of the technique of a standardized questionnaire. Three hundred sixty businessmen were surveyed, including those who had not participated in networking meetings.

The essence and term of networking in a contemporary economy

The development of a networking model of an economy is considerably influenced by more and more sophisticated and inter-related processes and phenomena which affect entrepreneurs. This form of collaboration between various entities resulted from progressing globalization, growth of different transactions, and increasing diversity of

products and services (Golasa P., 2013). If an enterprise is to participate in such a sophisticated economic reality, where variety and complexity are growing at the same time, elasticity is necessary. It is the elasticity of entrepreneurs' behaviour that contributed to the development of new collaboration forms, which, consequently, enabled access to information, skills, and technology that a particular entity had not possessed and that had been costly to gain. In result, networks appeared, including company networks (Korenik S., 2011). It is a network advantage that responsibility for activities is divided between numerous partners that are part of it, particular entities avoid overlapping expenses, have higher elasticity, and faster access to information and technology (Domanski R., Marciniak M., 2003).

The source literature defines networks in various ways. In its primary meaning, a network was a group of enterprises related to each other by diverse trade links to meet a specific market demand (Miszczak K., 2012). The most generally, however, networks can be defined as an organizational structure which does not possess hierarchy, formal management and subordination, and where information and collaboration relationships are prevalent (Kozusznik B., 2011). Therefore, it can be claimed that it is a system of links between people or organizational entities that belong to a given network which consists in sharing information, ideas, resource etc. In other words, a network is a set of selected links to chosen partners being part of market relations of enterprises (Jewtuchowicz A., 1997). The general term of companies' network is understood as their involvement in various long-lasting relationships with external business and social partners, including public administration (central and self-government one) representatives (Cieslik J., Dabrowski J., Koladkiewicz I., 2014).

The most important aim of a network company is to gain synergy through an

engagement in a collaboration of many economic partners, and the synergy is possible to achieve thanks to the adjustment of one's operational activity to the strategy of the whole network. Therefore, a coordination mechanism in a given network organization plays a significant role. It is responsible for activities taken in a particular network and it organizes the transfer of tangible and intangible assets in this system (Lachiewicz S., Zakrzewska-Bielawska A., 2012).

The source literature provides various classifications of network organization (of enterprises which belong to a network). Among other things, authors distinguish a classification as regards the permanence and strength of relations between entities that belong to a network (integrated networks, contract networks, direct relationships networks). Considering the extensiveness of the issue, the discussion was narrowed and the article presents the classification describing relationships between partners that includes:

- supplier networks – which cover subcontracting alliance between a customer and suppliers of indirect elements of production;
- producer networks – which enable competing producers to combine their production capability, financial and human resources to extend their product offer and geographical range;
- customer networks – which are fixed-term relationships of production companies with their distributors, marketing channels, trade middlemen that complete a product with various elements, and end users in domestic or international markets;
- technological collaboration networks – which enable acquisition of product projects and production technology, joined production, and development of technology as well as sharing scientific knowledge and research and development work results (Lachiewicz S., Zakrzewska-Bielawska A., 2012).

Networking can also be moved into regional and local policy. It was called a factor of external partner relations of self-government entities. Partnerships are registered as regards both towns and regions of a territory (Przybyła Z., 2008). Building intra- and inter-regional networks contributes to strengthening competitiveness. Extending collaboration with external partners from other regions or even countries enables to build direct contacts between interested parties, which makes gaining synergy possible. A network in a region consists of cooperatively related self-government entities (districts, poviats, voivodeships) and those concentrated on processes (enterprises, universities, research institutions, business-related service companies etc.) (Makiela Z., 2013). Establishing such a form of inter-regional collaboration which covers various market institutions aims at boosting economic growth. Creating an appropriate corporate culture and the best development conditions in a particular region should be the purpose of this collaboration (Grosse T. G., 2004).

Research results and discussion

The interest in local enterprise dimension has appeared in Poland relatively recently. On the one hand, it results from the growing influence of local communities on citizens' quality of life, on the other hand, it is also a group of definitely different interests but of large capability to influence the local community situation (e.g. as regards employment). The source literature mentions three characteristics describing "*an entrepreneurial local community*". They are: local companies interested in development; internal

integration of local businessmen's environment (a network which generates added value); entrepreneurs' integration with other members of local collaboration, keeping a group's identity. On the Polish conditions, one more characteristic should be added to the abovementioned. It is an efficient system of communication channels between businessmen and local self-government (Cieslik J., Dabrowski J., Koladkiewicz I., 2014).

As the significance of businessmen's networking is starting to be noticed in Poland as well, activities were initiated to research this issue among entrepreneurs in the agglomeration of Warsaw as part of the project Społeczne Forum Przedsiębiorczości (Social Forum of Enterprise). This survey was conducted by the Polish Agency for Enterprise Development in two stages from September 2012 to October 2014 and it covered 6 quarters of Warsaw (Ochota, Wola, Praga-Południe, Targówek, Ursynów, and Wilanów). The first stage of the project consisted in running diagnostic studies which aimed at identifying entrepreneurs' approach to establishing business relations, in other words, what benefits and barriers connected to networking they saw. It was done by means of the method of diagnostic survey with the use of the technique of a standardized questionnaire. Three hundred sixty businessmen were surveyed (including those who had not participated in networking meetings), and the structure of this sample reflected the structure of Warsaw entrepreneurs' population because the vast majority of them are micro entrepreneurs (90 %). The results of the first stage of the survey are presented in Table 1.

Table 1

Benefits and barriers in entrepreneurs' networking (in %)

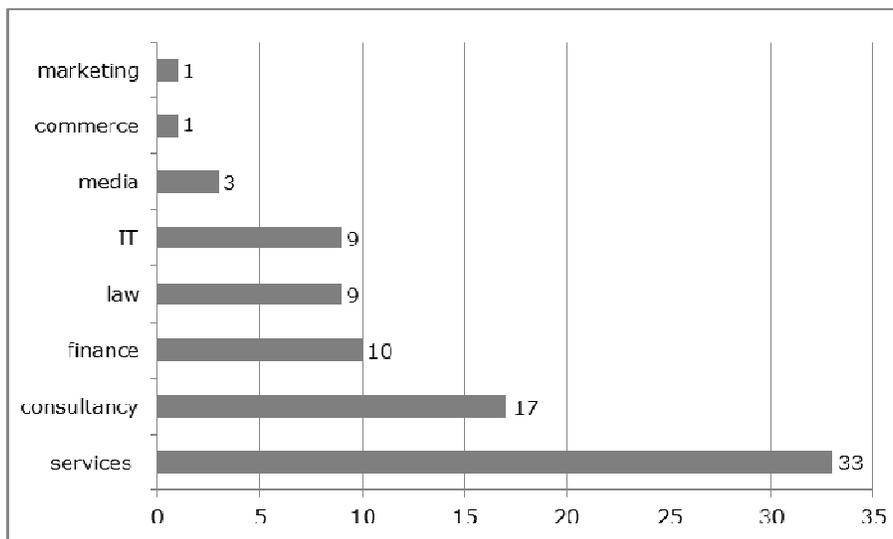
Benefits*	Percentage of replies
Improvement of product and service quality	33
Greater number of customers	27
Collaboration with a greater number of suppliers and contractors	18
Lower costs	16
No technical problems	12
Developing employees' qualifications and skills	7
Opportunity to gain financial support	4
Barriers*	Percentage of replies
Too little time	47
Too few occasions to establish business contacts	34
Too long period before benefits from contacts appear	31
No confidence in business partners	30
No benefits from sharing experience	23
Other	2

*A respondent was allowed to indicate more than one answer

Source: the author's own work based on: J. Cieslik, J. Dabrowski, I. Koladkiewicz (2014). Lokalne sieci przedsiębiorców (Local networks of entrepreneurs). In Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012 - 2013 (Report on the condition of small and medium-sized enterprises in Poland in 2012-2013). Warsaw: the Polish Agency for Enterprise Development, p. 119 - 120.

The second stage of the survey covered only those businessmen who actively participated in networking meetings (214 people). Figure 1 presents data concerning recommendations of

people met as part of networking meetings (broken by industries) to other entrepreneurs who did not take part in those meetings.



*A respondent was allowed to indicate only one reply

Source: the author's own work based on: J. Cieslik, J. Dabrowski, I. Koladkiewicz (2014). Lokalne sieci przedsiębiorców (Local networks of entrepreneurs). In Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012 - 2013 (Report on the condition of small and medium-sized enterprises in Poland in 2012-2013). Warsaw: the Polish Agency for Enterprise Development, p. 122.

Fig. 1. Recommending people met at networking meetings to other entrepreneurs – by industries, %

The majority of respondents had an opportunity to recommend people met during networking meetings to other entrepreneurs. It was declared by nearly 80% of respondents. Most frequently, they recommended people working in services (33%), consultancy (17%), and finance (10%). People from commerce and

marketing were the least frequently recommended.

During the survey, entrepreneurs were also asked what topics would be interesting for them at meetings with other businessmen. The detailed data are presented in Table 2.

Table 2

Topics tackled as part of networking meetings (in %)

Topics interesting for entrepreneurs*	Percentage of replies
Sales skills	18
Finance	15
Marketing activity	12
Soft skills (self-presentation, stress resistance)	9
IT	9
Consultancy	9
Contacts and interpersonal relationships (interpersonal communication)	8
Customer acquisition and service	7
Law	4
Other	9

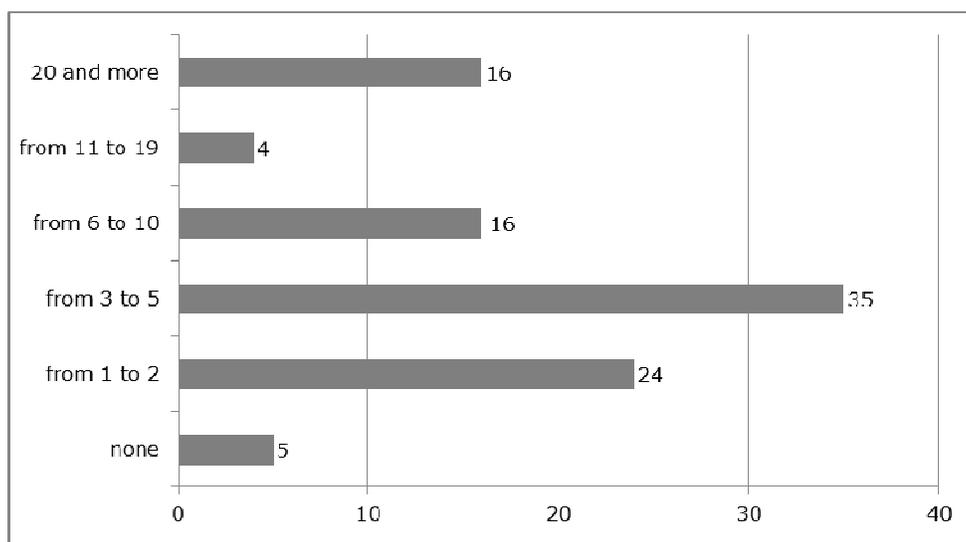
*A respondent was allowed to indicate only one reply

Source: the author's own work based on: J. Cieslik, J. Dabrowski, I. Koladkiewicz (2014). Lokalne sieci przedsiębiorców (Local networks of entrepreneurs). In Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012 - 2013 (Report on the condition of small and medium-sized enterprises in Poland in 2012-2013). Warsaw: the Polish Agency for Enterprise Development, p. 123.

The survey revealed that entrepreneurs would be interested in topics from various areas. Most frequently, respondents indicated their willingness to learn sales skills (18 %). Topics concerning finance (15 %) were on the second position, and marketing (12 %) was the third. Respondents pointed out topics related to law

and customer acquisition and service (4 % and 7 % respectively) the least eagerly.

In the end, entrepreneurs were asked how many people they would recommend participating in meetings of this kind. The detailed data are presented in Figure 2.



Source: the author's own work based on: J. Cieslik, J. Dabrowski, I. Koladkiewicz (2014). *Lokalne sieci przedsiębiorców (Local networks of entrepreneurs)*. In *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012 - 2013 (Report on the condition of small and medium-sized enterprises in Poland in 2012 - 2013)*. Warsaw: the Polish Agency for Enterprise Development, p. 122.

Fig. 2. Number of people that entrepreneurs would recommend establishing contacts as part of networking meetings, %

The data presented in Figure 2 show that entrepreneurs consider network collaboration sensible. As many as 35 % of respondents would recommend establishing contacts at networking meetings to at least 3 other people. Only 5 % of respondents would not recommend such meetings to another person.

Conclusions

The research, led to drawing the following conclusions:

- 1) Polish entrepreneurs are deeply aware of the need to keep long-lasting relationships with customers as well as suppliers and business partners.
- 2) Entrepreneurs are eager to share the information on networking meetings with

other entrepreneurs, which can later result in collaboration.

3) Entrepreneurs were willing to tackle the topics connected to both direct financial benefits and an indirect influence on their companies' profits (soft skills).

4) To sum up, it can be claimed that the social dimension of local networks should be discussed in the context of relations that are established between business and local administration at the level of districts, towns, or quarters. The lack of such an effective collaboration may contribute to the failure of the use of entrepreneurial potential as a factor of a given area's development.

Bibliography:

1. Cieslik, J., Dabrowski, J., Koladkiewicz, I. (2014). *Lokalne sieci przedsiębiorców (Local Networks of Entrepreneurs)*. In *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce w latach 2012 - 2013 (Report on the Condition of Small and Medium-Sized Enterprises in Poland in 2012-2013)*. Warsaw: the Polish Agency for Enterprise Development, p. 114.
2. Domanski, R., Marciniak, A. (2003). *Sieciowe koncepcje gospodarki miast i regionów (Networking Concepts of Towns' and Regions' Economy)*. Studia Volume CXIII, Warsaw: Committee for Spatial Economy and Regional Planning, Polish Academy of Sciences, p. 14.
3. Golasa, P. (2013). *Taxes and Social Insurance Contributions Charges of Farms in Poland in the Years 2004-2008*. Economic Science for Rural Development: Production and Cooperation in Agriculture / Finance and Taxes. Proceedings of the International Scientific Conference, Issue: 30, pp. 242-247.
4. Grosse, T. G. (2004). *Polityka regionalna UE na przykładzie Grecji, Włoch, Irlandii i Polski (The EU Regional Policy Exemplified by Greece, Italy, Ireland, and Poland)*. Warsaw: Institute of Public Affairs, p. 20.

5. Jewtuchowicz. A. (1997). Przedsiębiorczość, innowacje i konkurencyjność regionów (podstawowe pojęcia i identyfikacja problemów) (Enterprise, Innovations, and Competitiveness of Regions (Basic Terms and Problem Identification). In Jewtuchowicz. A. (Ed.), *Środowisko przedsiębiorczości – innowacje a rozwój terytorialny* (Enterprise Environment – Innovations and Territorial Development). Łódź: Wydawnictwo Uniwersytetu Łódzkiego, p. 13.
6. Korenik. S. (2011). Region ekonomiczny w nowych realiach społeczno-gospodarczych (An Economic Region in New Social and Economic Reality). Warsaw: Wydawnictwo CeDeWu Sp. z o.o., p. 56.
7. Kozusznik. B. (2011). *Zachowania człowieka w organizacji* (Human Behaviour in an Organization). Warsaw: Polskie Wydawnictwo Ekonomiczne, p. 272.
8. Lachiewicz. S., Zakrzewska-Bielawska. A. (2012). Sieć przedsiębiorstw jako skuteczna forma organizacyjna w warunkach kryzysu gospodarczego (Enterprise Networking as an Effective Organization form During an Economic Crisis). In *Management and Business Administration. Central Europe*, 4/2012 (117), Warsaw: Wydawnictwo Akademia Leona Kozłowskiego, p. 37.
9. Makiela. Z. (2013). Przedsiębiorczość i innowacyjność terytorialna. Region w warunkach konkurencji (Territorial Entrepreneurship and Innovativeness. A Region in Competitive Conditions). Warsaw: Wydawnictwo C.H. Beck, p. 219.
10. Miszczak. K. (2012). Dylematy rozwoju regionu ekonomicznego w świetle wyzwań XXI wieku (Dilemmas of an Economic Region Development Against the 21st Century Challenges). Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, p. 87.
11. Przybyła. Z. (2008). Terytorialne wieże sieciowe (Territorial Networking). In Klamut. M. (Ed.), *Ekonomia i międzynarodowe stosunki gospodarcze* (Economics and International Economic Relations). Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, p. 105.
12. Rokicki. T. (2013). *The Importance of Logistics in Agribusiness Sector Companies in Poland. Economic Science for Rural Development: Production and Cooperation in Agriculture / Finance and Taxes*. Proceedings of the International Scientific Conference, Issue 30, pp. 116-120.

RURAL COOPERATIVE MOVEMENT – PROSPECTS OF CHANGES

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Abstract. The paper draws attention to the fact that the development of cooperative forms of administration in rural areas fosters job creation, integration of dispersed resources, and an increase in the activity of people with lower incomes. Despite the collapse of the cooperative movement, cooperatives begin to restore their potential; however, in addition to the few traditional cooperatives which have adapted to the market economy conditions, the so-called new cooperatives keep emerging. Particularly important areas of the activity of those cooperatives include: well-being services, renewable energy generation based on the use of substrates from agricultural sources, small-scale production, provision of services to the elderly, and support of tourism. The aim of the study was to indicate the possibilities for the development of rural cooperative movement based on opinions of the cooperative sector representatives. The study was carried out in 2015, using an interviewer questionnaire, on a purposely selected group of 88 managers representing a variety of forms and types of cooperatives operating in rural areas in the north-eastern Poland.

Key words: cooperatives, rural areas,

JEL code: D7, Q13

Introduction

Opinions on the role and significance of cooperative forms of conducting economic activities by rural inhabitants, expressed in the literature on the subject, are diametrically opposed. On the one hand, the status of the development of rural cooperative movement is being paid little attention to, and each enhancement of this status with new entities or spheres of activity is considered a secondary effect being an element of the general interest in the idea of cooperatives. On the other hand, it is commonly believed that the level of market competitiveness of cooperative entities is low. The views belittling the role and significance of the cooperative movement as a manner of administration are, however, being replaced by opinions recognising cooperatives as an important area of social and economic activities of the rural population (Chaddad F. R., Cook M. L., 2004; Kawa M., Kuzniar W., 2009; Brodzinski M. G., 2011). A cooperative is, primarily, an instrument allowing more effective operation, since in this way it is possible to reduce costs and, at the same time, increase the value of a product as well as the opportunities to compete (Bite L. et al., 2013). However, it needs

to be borne in mind that a cooperative is an autonomous association of people who act on a voluntary basis to satisfy common economic, social and cultural needs, and strive to fulfil aspirations through common ownership and democratic control of the enterprise (Gupta C., 2014).

The experience indicates that in the Western European countries, the participation of cooperatives in economic activities is greater than that in post-socialist countries. In the economically developed EU countries, farmers sell more than 60 % of their produce through cooperatives. Such a strong position of agricultural cooperatives has been requiring an improvement in the economic effectiveness and organisational efficiency of a cooperative enterprise, and, at the same time, care for the maintenance of the cooperative identity.

As regards Poland, despite the downward trend prevailing since the beginning of the 1990s, Polish cooperatives still have a large economic base and an approx. 3 % share in the national labour market and in production of the entire national economy. They play an important role in local communities by supplying products and services to local markets, and have, in 40%

cases, a dominant position in these markets (Nalecz S., Konieczna-Salamatin J., 2008).

It is estimated that out of approx. 17.15 thousand cooperatives operating in Poland, 17.6 % of them are cooperatives engaged in agriculture and hunting as well as services related to these areas, while another 11.6 % of them are cooperatives conducting economic activities in the processing sector (Krysiak I., 2006; Zmija J., 2013). Despite the negative experiences of the past period, the cooperatives which have gone through the restructuring process are coping much better in the present reality. After losing the protective umbrella of the state, they reorganised their structures and adjusted their objectives to both the market economy conditions and cooperative members' expectations (Mickiewicz A. et al., 2014).

When observing the ongoing debate on the European Union forum, one may notice that the cooperative forms of administration and social activity fit into the social economy attracting more and more interest from the public. However, a major problem that remains is that the value of cooperation is most often measured as monetary compensation, while other, non-financial benefits of cooperation are rarely appreciated (Ryhänen M. et al., 2013).

Cooperatives, similarly to other forms of social enterprises, are characterised by:

- a welfare or social objective of common interest, which is an important element in conducting commercial activities;
- reinvestment of a significant portion of profits in the accomplishment of social objectives;
- the way of organising or a system of ownership reflecting the mission, based on democratic or participatory principles, and aimed at social justice (Inicjatywa ..., 2011).

However, these advantages, beneficial from the social point of view, give rise to concern as to whether a cooperative, as a form of conducting economic activities, may be of interest to

entrepreneurial people. On the one hand, given the experience gained from the previous political system, the vast majority of rural population either place no trust in cooperatives or consider such entities as rather uncompetitive. On the other hand, there are few cooperatives which could serve as an example to people and groups searching for opportunities to run a business jointly. Entrepreneurial people, while deciding to conduct economic activities in a cooperative form, take responsibility for a group at the same time, and are virtually obliged to stimulate the local community.

When observing the process of setting up and development of new cooperatives, one can notice that the decisions on the manners of production of goods and provision of services are mainly targeted at objectives of social nature¹ as well as the supply of goods intended for vulnerable population groups (in rural areas, this primarily includes assistance to the elderly or the disabled, child care, access to the employment and training etc.).

The advantages of the cooperative form of administration, as indicated in the literature, are associated with the following aspects thereof:

- joint ownership, joint decision making, and joint responsibility;
- stability and safety of the employment, and egalitarianism, in particular in terms of pay;
- a sense of being a part of the community, which inter alia contributes to an increase in motivation and productivity, and to greater attention to the joint property;
- distribution of profit which remains with workers – members of the cooperative;
- lower capital required for setting up of a cooperative, as compared to that required for companies;

¹ i.e. social or occupational inclusion through the access to employment for people being disadvantaged, in particular due to their low qualifications or social/occupational problems leading to the exclusion and marginalisation.

- financial liability being smaller than in sole proprietorships and companies;
- tradition of the cooperative movement;
- social and educational functions (Kodeks dobrych praktyk ..., 2008).

The opinion according to which the cooperative sector stimulates the dispersed capital as well as labour resources in local environments arouses no controversy (Brzozowski B., 2014). However, despite the numerous, above-mentioned advantages of cooperatives, they are going through a crisis, even in the countries in which they have been developing very rapidly. This is observed at three levels associated with defining the following:

- own identity (cooperatives which have achieved success become similar to conventional enterprises);
- measures aimed at an improvement in efficiency (given their social objectives and a democratic style of management, the economic efficiency of cooperatives may be lower);
- the way the environment perceives the cooperative forms of administration (the lack of understanding among policy makers, other entrepreneurs, and the general public).

The aim of the study was to indicate the possibilities for the development of rural cooperative movement based on opinions of the cooperative sector representatives. The study was carried out in 2015, using an interviewer questionnaire, on a purposely selected group of 88 managers representing a variety of forms and types of cooperatives operating in rural areas in the north-eastern Poland. Participants of the study represented cooperatives which employ their members and conduct activities in the areas of (agricultural) production, trade, agri-food processing, services etc.

Research results and discussion

A cooperative as a suggested form of conducting economic activities

The cooperative movement in Poland begins to be perceived again as an attractive form of collective entrepreneurship of rural inhabitants². In the Western European countries, as noted by Mering T. (2013), in certain sectors cooperatives play an important role, and their emergence results from searching for a form of conducting economic activities, which is an alternative to privately owned enterprises. The view that cooperatives as a form of collective resourcefulness provide actual opportunities for economic and social activity of people with low and medium incomes, prevent their social exclusion, and alleviate the economic and social inequalities, is expressed more and more emphatically (Krasuska B., 2009; Pawlewicz A., 2014). Importance of horizontal integration in organic farming. Economic Science for Rural Development. Jelgava, Latvia University of Agriculture, No. 34. 2014. pp. 112-120.).

Due to the specificity of cooperative forms of administration, they are an offer of business organisation particularly in the regions, the development of which is lagging behind, in which other forms of conducting economic activities are less profitable. In addition to satisfying economic needs, cooperatives serve functions of self-help, social, and welfare nature. The functioning of cooperatives may create an opportunity for economic and social activity of various occupational or social groups, in particular those with lowest incomes (Dyka S., Grzegorzewski P., 2000).

While searching for opportunities for supporting the development of projects of cooperative nature, one should take account of

² Tradition of the cooperative movement in Poland dates back to the second half of the 19th century. A cooperative form of administration has proven successful in various periods, particularly in the areas inhabited by a poorer population. Experience gained from the past indicates that this form of management plays a significant economic and social role.

the numerous barriers associated with the operation of cooperatives. The authors' research reveals that those most often indicated by members of cooperatives are as follows (each of the presented barriers was identified by at least 30 % respondents):

- the market situation which promotes private entities;
- unfair competition;
- difficulties in raising funds for development;
- democratic form of management, due to which, in many cases, pressure is exerted by members of the cooperative who demand that the profits be realised quickly in a form of a dividend;
- hostile environment, primarily the institutional one;
- rural inhabitants' sceptical approach to this form of administration.

The above list of limitations to the operation of cooperatives is not exhaustive, and many of the presented barriers are mentioned in discussions on the support for rural inhabitants' entrepreneurship in general.

When the participants of the study were asked to justify the need for developing the activities of the already existing cooperatives and setting up new ones, more than every third respondent indicated the following reasons (each participant of the study could provide a few answers):

- possibilities for solving problems of local unemployment which increases with the consolidation of market economy;
- a low financial risk associated with conducting economic activities in a form of a cooperative;
- the necessity to satisfy diverse local needs articulated by certain social groups, and, at the same time, from the growing awareness that the cooperative form is appropriate for satisfying those particular needs;
- the need for developing social activity which, for many people, determines their functioning in the local environment.

From the study participants' perspective, it is difficult to assess the preferences with regard to cooperatives in terms of the development of productive activities and services. Everybody awaits the stabilisation of the operation instead of the development of activities, particularly by undertaking new activities. On the one hand, however, it should be noted that members of cooperatives search for innovations. On the other hand, they point out that decisions concerning setting up of a cooperative or the implementation of a project are determined by the availability of support from the EU funds. Cooperatives have made use of these funds, and it was observed that their members awaited further possibilities for using this aid. According to more than 3/4 of the interviewed participants, the economic effectiveness of cooperatives operating on the free market economy conditions is not lower in comparison to other legal forms of enterprises operating in Poland, and the existing differences may arise not so much from lower competitiveness of cooperatives as from the differences in the manner of taking decisions and conducting activities (orientation towards social objectives).

Representatives of cooperatives participating in the study were able to indicate numerous examples of non-economic functions being performed by the cooperatives they were representing. As examples of their own activities of this type, they most often indicated the material and organisational assistance to public institutions, and the participation in organisation of local events supporting the integration of inhabitants.

As regards barriers to the development of cooperatives in rural areas, and those standing in the way of the development of cooperative movement in Poland, the study participants particularly indicated the low level of awareness, particularly in rural inhabitants, of the operation of a cooperative. Cooperatives are often perceived by the public as a "relic of the past".

Another identified barrier is the problem of unfavourable legislative solutions, in the light of which cooperatives are treated as companies, which, given the relatively low starting capital, inhibits the emergence of cooperatives (especially social ones).

Representatives of rural cooperative movement are aware of their participation in the promotion of cooperative movement in rural areas in Poland; moreover, they notice specific manners of removing barriers to this emergence. They are convinced that this is the activity of cooperatives that is conducive to the promotion of various forms of cooperation, principally among the mass of dispersed, numerous agricultural producers as well as the socially excluded.

New cooperative forms of entrepreneurship

Experience shows that cooperatives appear to be particularly effective in those areas of socio-economic life in which failures of the market of the state policy are observed, e.g. in the social services sector. Observation of changes in the economic scene of Polish rural areas allows one to notice that in addition to the traditional forms of cooperatives, new ones emerge, including cooperatives functioning as groups of agricultural producers, social, machinery, and energy cooperatives as well as other forms of cooperatives, the so-called "new wave" ones.

In Poland, cooperative groups of agricultural producers (GAPs) amount to approx. 30 % of the total of functioning groups, and have 2.5-times more members – agricultural producers than groups organised as limited liability companies (Spoldzielcze ..., 2015). The authors' own research lead to the conclusion that GAP members consider the cooperative form of administration to be convenient and safe, and requiring no particularly increased activity and commitment on their part. However, in the market economy conditions, there is no possibility for conducting rational and effective

activities without the involvement of cooperative members.

In the West European countries, well-organised agricultural producers in agricultural cooperatives combine the market offer of many farms, which multiplies their economic power and market opportunities (Gorka M., Ruda M., 2012; Altman M., 2015). One of the main objectives of setting up a group of agricultural producers is the sale, by the group members, of all products or the entire range of products manufactured in farms through the group.

As regards social cooperatives, their area of economic activities is linked to the skills of both founders and workers. Social cooperatives are distinct from commercial entities due to the orientation of their activities towards the accomplishment of social objectives, and their functioning is not subject to the criteria of profitability, economic effectiveness and competitiveness (Thomas A., 2004). Organisation of economic activities in a form of a social cooperative is, as noted by Krasuska B. (2009), a proposal addressed mainly to the unemployed, homeless, addicted, mentally ill, migrants, or disabled people who, for a variety of reasons, are not able to independently undertake economic activities. They are, however, interested in undertaking cooperative economic activities in a group, and thus in dissipating and reducing the risk of running own business. Respondents who represented this particular type of a cooperative in the study emphasised that the nature of a social cooperative was mainly determined by the type of people who have set up the cooperative and individual work of the members. The observed, numerous projects involving setting up social cooperatives in Poland in the years 2010-2014 are mainly an effect of supporting such projects with external funding.

Machinery cooperatives are an organisational form which is little known in Poland. High prices of machinery and the dwindling purchasing power of farms may, given the current situation of

Polish rural areas, and agriculture in particular, be conducive to the organisation of farmers into various systems of the collective use of machinery. As indicated by the experience of other European countries, cooperation and benefits are always bilateral there – a farmer provides services with their machines while being provided with services offered by other farmers (Maszynowa ..., 2002). This form of organisation of the system seems to be optimal to numerous groups of farmers organising cooperation within a relatively large area (a few villages), who have limited investment opportunities. The experience shows that the most frequently employed methods for the use of machinery is informal neighbourly help, often provided to each other with no financial settlement (Harris A., Fulton M., 2000).

An energy cooperative is an offer of cooperation involving joint investment of many people in a prosumer installation. An interest in cooperation will depend on the profitability of the investment which, in the case of cooperatives, is based to a large extent on the savings which may be obtained by prosumers. An important argument for the development of this type of group activity is the prospect of the actual profit on the energy resold to the grid (Wilson E. J. et al., 2008; Yadoo A., Cruickshank H., 2010). A precursor of energy cooperatives in Poland is Spółdzielnia Nasza Energia (Cooperative "Nasza Energia"). Within the area of partner communes, construction is planned of a complex of biogas power plants including a distribution system (low-voltage power lines). In view of the alternative of an increase in energy prices, it can be assumed that energy cooperatives may be perceived by local communities as an alternative way of gaining access to renewable energy sources and relatively cheap energy.

Conclusions, proposals, recommendations

Cooperatives should, by their nature, unite people, since what is often successfully achieved

in interpersonal relationships is immeasurable, and can bring about tangible effects in the longer term. Operating in a group means assistance and support in the development of new projects and initiatives. Experience of many European countries shows that rapid development of certain branches of cooperatives, both the traditional and the "new wave" ones, depends on stable legislation as well as functioning mechanisms of financial and advisory support. These factors induce farmers and other rural inhabitants to integrate within a cooperative, and carry out joint projects in many areas of the economy (trade, power generation, services).

The syndrome of an ineffectual, post-communist cooperative is overcome by examples of thriving, sometimes in close vicinity, dairy cooperatives, cooperative groups of agricultural producers, or social cooperatives. It is difficult to predict the direction of changes; however, it is worth to indicate cooperatives as an alternative option of cooperation, particularly of persons and entities that have no resources allowing the implementation of economic initiatives requiring substantial financial resources, undertaken in niche areas.

To sum up, it can be concluded that the promotion of cooperative forms of economic and social activities in rural areas will always be accompanied by ambivalence. Some people will be convinced that promoting cooperatives means a failure, and that the social system of running a business is an anachronism. Others will argue that cooperative forms of administration provide the opportunity to find a manner of changing the organisation of economic processes, and genuine integration of rural inhabitants around social values, and that the cooperative forms of administration may significantly improve the dynamics of multifunctional rural development. A decision on this matter will never be unambiguous. It seems that this form of conducting economic activities fosters job creation, integration of dispersed resources, and

an increase in the activity of people with lower incomes. It was noted during the study that the particularly important areas of activity of the currently operating rural cooperatives are: agricultural production and agri-food processing,

renewable energy generation based on the use of substrates from agricultural sources, well-being services, and services related to support of tourism.

Bibliography

1. Altman, M. (2015). *Cooperative Organizations as an Engine of Equitable Rural Economic Development*. Journal of Co-operative Organization and Management, Volume 3(1), pp. 14-23.
2. Bite, L., Muska, A., Glusaka, D. (2013). *Gains of Grain Producers from Horizontal Mergers in Zemgale Region*. Economic Science for Rural Development. Volume 30, pp. 147-152.
3. Brodzinski M.G. (2011). *Oblicza polskiej spoldzielczosci wiejskiej, poczatkki - rozwoj – przyszlosc (The Face of Polish Rural Cooperatives, the Begining - Development - Future.)*. Krajowa Rada Spoldzielcza, Warszawa. p. 195.
4. Brzozowski B. (2014). *Spoldzielczosc wiejska w aktywizacji srodowisk lokalnych (Rural Co-operatives Activating Local Environments)*. Zagadnienia Doradztwa Rolniczego, Volume 4. pp. 98-109.
5. Chaddad, F. R., Cook, M. L. (2004). *Understanding New Cooperative Models: an Ownership-control Rights Typology*. Applied Economic Perspectives and Policy, No. 26(3), pp. 348-360.
6. Dyka S., Grzegorzewski P. (2000). *Zarzadzanie spoldzielnia (Management of the Co-operative)*. Wyd. Difin, Warszawa. p. 194.
7. Gorka, M., Ruda, M. (2012). *Spoldzielcze formy gospodarowania na przykladzie rolniczych spoldzielni produkcyjnych (Cooperative Forms of Management – Agricultural Cooperatives)*. Nierownosci społeczne a wzrost gospodarczy. UR. Volume 27, pp. 234-240.
8. Gupta, C. (2014). *The Co-operative Model as a 'Living Experiment in Democracy'*. Journal of Co-operative Organization and Management, Volume 2(2), pp. 98-107.
9. Harris, A., Fulton, M. (2000). *Farm Machinery Co-operatives: an Idea Worth Sharing*. University Saskatchewan, Centre for the Study of Co-operatives. pp. viii.
10. *Inicjatywa na rzecz przedsiębiorczosci społecznej (Initiative on Social Entrepreneurship)*. Budowanie ekosystemu sprzyjającego przedsiębiorstwom społecznym w centrum społecznej gospodarki i społecznych innowacji. (2011). KOMISJA EUROPEJSKA, Bruksela, dnia 25.10.2011, p. 15.
11. Kawa, M., Kuzniar, W. (2009). *Rola spoldzielczosci jako instytucji w przeciwdzialaniu nierownosciom ekonomicznym i społecznym (The Role of Co-operative Movement in Counteracting Economic and Social Inequalities)*. Nierownosci społeczne a wzrost gospodarczy. UR, Volume 15, pp. 310-317.
12. *Kodeks dobrych praktyk spoldzielczych (Code of Good Practice Cooperative)*. (2008). Krajowa Rada Spoldzielcza, Warszawa, p. 1.
13. Krasuska, B. (2009). *Spoldzielnia socjalna jako forma dzialalnosci gospodarczej (Social Cooperatives as a Form of Economic Activity)*. WUP w Warszawie. Wydział Regionalnej Polityki Rynku Pracy. Warszawa. p.19.
14. Krysiak, I. (2006). *Informacja o sektorze spoldzielczym w Polsce (Information about the Cooperative Sector in Poland)*. Ekonomia Społeczna teksty, p. 22.
15. *Maszynowa Wspolnota w Unii Europejskiej (Machinery Community in the European Union)*. (2002). Retrieved: <http://www.ppr.pl/artukul-maszynowa-wspolnota-w-unii-europejskiej-20152-dzial-9.php> Access: 10.12.2015
16. Mering, T. (2013). *Spoldzielczosc a polityka Unii Europejskiej w okresie kryzysu finansowego i gospodarczego (Cooperatives and the EU Policy During the Financial and Economic Crisis)*. Problemy Polityki Społecznej. Studia i Dyskusje, Volume 20, pp 67-87.
17. Mickiewicz, A., Mickiewicz, B., Wawrzyniak, B.M. (2014). *Charakterystyczne cechy rolniczych spoldzielni produkcyjnych funkcjonujących w latach 1949-2010 (Characteristics of Agricultural Production Cooperatives Operating in the Years 1949-2010)*. Zagadnienia Doradztwa Rolniczego, Volume 3, pp. 51-71.
18. Nalecz, S., Konieczna-Salamatin, J. (2008). *Polska spoldzielczosc na początku XXI w.: zasoby oraz wybrane funkcje społeczno-ekonomiczne (Polish Cooperative at the Beginning of the XXI Century: Resources and Selected Socio-economic Functions)*. Spoldzielczy Kwartalnik Naukowy, Volume 1, pp. 5-14.
19. Pawlewicz, A. (2014). *Importance of horizontal integration in organic farming*. Economic Science for Rural Development. Jelgava, Latvia University of Agriculture, No. 34. 2014. pp. 112-120.
20. *Spoldzielcze Grupy Producentow Rolnych (Cooperative Groups of Agricultural Producers)*. Retrieved: http://www.krs.org.pl/index.php?option=com_content&view=article&id=162&Itemid=351 Access: 27.11.2015
21. Thomas, A. (2004). *The Rise of Social Cooperatives in Italy*. Voluntas: International Journal of Voluntary and Nonprofit Organizations, Volume 15(3), pp. 243-263.
22. Wilson, E. J., Plummer, J., Fischlein, M., Smith, T. M. (2008). *Implementing Energy Efficiency: Challenges and Opportunities for Rural Electric Co-operatives and Small Municipal Utilities*. Energy Policy, Volume 36(9), pp. 3383-3397.
23. Yadoo, A., Cruickshank, H. (2010). *The Value of Cooperatives in Rural Electrification*. Energy Policy, Volume 38(6), pp. 2941-2947.
24. Zmija, J. (2013). *Wstep (Introduction)*. in: *Spoldzielczosc w swiadomosci rolnikow i doradcow oraz praktyczne wykorzystanie idei spoldzielczej do rozwoju przedsiębiorczosci na obszarach wiejskich*. CDR w Brwinowie, Krakow, pp. 3-4.

SUPPORT MEASURES TO EMPLOYERS FOR WORK-BASED LEARNING

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Abstract. The aim of the paper is to investigate the significance of support measures for employers in the implementation of work-based learning - from the perspective of employers and sector experts as well as from the perspective of public administrators responsible for the implementation of work-based learning in the vocational education and training system in Latvia. The opinions of both target groups were identified and compared. Methods applied in the current paper: analysis of scientific publications, survey of entrepreneurs, sectors experts and public administrators. For the analysis of the surveys data - descriptive statistical analysis, cross tabulations, Mann-Whitney U test as well as multivariate statistical analysis method - factor analysis were applied. In the survey, questionnaire for most of the questions the evaluation the scale 1 - 10 was applied to evaluate the attitude of the respondents, where 1 - not significant, 10 - very significant.

The obtained results indicate that all the proposed support measures received relatively equal and high evaluation from the employers/ experts testifying the topicality of the issue and the high level of needs and support expectations from the employers. The evaluations by public administrators and entrepreneurs/experts were fairly similar, and they fall into two major groups - practical/ material support and pedagogical/ information support. Contrary to the researchers' expectations - the least scores were attributed to the significance of the information measures and campaigns. The conclusion is that a broad spectrum of equally important support measures are needed in implementing work-based learning, however, underestimating the role of information measures on both parts - employers and public administrators - may hinder a successful implementation of the introduction of work-based learning at system level in Latvia.

Key words: employers, support measures, work-based learning.

JEL code: J24; J44; M53; I28.

Introduction

In Latvia, work-based learning is a high level priority in the development of vocational education and training (VET). Preparing respective legal framework is a major challenge for the involved parties, especially given the various interests of the key stakeholders. The public administrators responsible for effective running of the VET system are concerned with ensuring optimal education and training conditions in the training of competitive labour force for the national economy. The employers are interested to obtain a well trained labour force at a reasonable cost and with minimal administrative burdens. It is a challenge to make the interests of these two involved parties meet and to develop optimal legal framework that satisfies these two involved parties. The present paper is based on the results of a study performed in 2014 and 2015 among public administrators and employers/sector experts

concerning the feasibility of introducing work-based learning approaches in the VET system of Latvia. The aim of the study was to identify the similarities and differences in opinions of public administrators on the one hand, and the employers and sector experts on the other hand - in relation to various aspects of implementing work-based learning. The focus in the present paper is on the role of particular centralised measures for implementing this innovative approach in the VET system of Latvia.

Methods applied in the current paper: analysis of scientific publications, survey of entrepreneurs/ sectors experts and public administrators. For the analysis of the surveys data - descriptive statistical analysis, cross tabulations, Mann-Whitney U test as well as multivariate statistical analysis method - factor analysis. In the survey questionnaire in order to evaluate the attitude of the respondents, the

scale 1 - 10 was applied where 1 - not significant, 10 - very significant.

It was being anticipated that the opinion of these two major target groups will be basically different, given their inherently different perspectives and interests. However, the research showed that both, the public administrators and the employers/ sector experts are of fairly similar opinion concerning the needed support measures to the entrepreneurs. These similar levels of awareness, among other things, may testify to the existing good co-operation among social partners in Latvia concerning the implementation of VET as well as to the capacity of the public administration to anticipate the actual needs of the entrepreneurs when initiating new policy approaches in VET.

Being aware that work-based learning in the VET system of Latvia should be introduced in compliance with the specific socio-economic situation and the education and training tradition in Latvia, it is important to take into consideration the research results on this issue in relation to the acquired experience in other countries. Academic research on this problem presents a wealth of material and conclusions. At the same time, also policy discussion at European level indicates that work-based learning is being seen as a potential solution in the training of a competitive labour force in Europe. The EU prepared policy document *Riga Conclusions* (Riga Conclusions, 2015) as a mid-term policy document for the development of VET in Europe Union States work-based learning as one of the five key priorities – to be implemented in each EU Member State in compliance with the national VET system (tradition) and policy priorities. The EU Member States are being encouraged to promote work-based learning in all its forms, by involving social partners, companies, chambers and VET providers as well as by stimulating innovation and entrepreneurship. Therefore, studying the feasibility for introducing the work-based learning from the perspective of various

stakeholders is of particular importance and value for better policy making and sound decisions by the public administration.

Results of academic discussion

In recent academic research, an increasing amount of studies is being dedicated to the analysis of work – based learning – an approach in vocational education and training having produced good results in such countries as Germany, Austria, the Netherlands and others. Issues on the potential transfer of this model to other countries are being discussed in academic research as well (Wieland, 2015). However, there are several types of vocational education systems (Greinert, W. D., 2004) and it is not possible to transfer directly one country system to another country. Learning as apprentices has different approaches and traditions depending on the country (Fuller and Unwin, 2003). Learning on profession and developing skills in vocational education during the practical placements are also being addressed by academic research (Pang, 2015), including also informal learning in workplace (Eraut, 2004). Many arrangements have to be addressed by legislators, public administrators, educators and employers to develop successful collaborative teaching and learning in the workplace (Tanggaard, 2005). Pedagogical beliefs and experience in work-based learning and analysis as well as implications for teachers' belief orientations are taken into account and stressed by British scientists (Abukari, 2014). In work-based learning provision, it is important to take into account employee perceptions of their workplaces as learning environments (Coetzer, 2007). Issues on organization of practical placements, including requirements for teachers in different countries vary (Bathmaker and Avis, 2005), also the organization and guidance of learning at work differs (Billett, 1999) as well as organizational approaches and the conditions for apprentices' learning activities at work (Messmann and Mulder, 2015). Analysis of

practical placement problems are in the focus (Billett, 2000), stressing the most complicated problem of workplace arrangement issues for practical placement (Billett, 2001). Organisation aspects and discipline in work-based learning are important aspects analysed by several researchers (Gibbs and Costley, 2006). In academic publications the need to take into account socio – economic conditions and cultural background for successful arrangement of work-based learning are stressed (Blåka and Filstad, 2007). Personal identity and organisational culture influences real realisation of work-based learning (Ahlgren, et al., 2010). Supervision of work-based learning has also a great importance for successful arrangements of work-based learning (Collin and Valleala, 2005) as well as the issue for finding the right balance and crossing boundaries between school and work during apprenticeships (Akkerman and Bakker, 2012). Issues of pedagogy of work-based learning and perceptions of work-based learning in foundation degrees are in the scope of academic research interest (Burke, et al 2009) and the major and fundamental questions: learning to work and learning to learn (McCormack, et al., 2010).

The analysis of the academic research on work-based learning allows conclude that the chosen approaches should be considered in a systemic way – in compliance with the overall conditions in the country in question.

Empirical research results

In the present paper the analysis has been performed on the following questions:

- 1) entrepreneurs' and sector experts evaluations on centralised activities for a successful introduction of work based learning (WBL) in Latvia;
- 2) public administrators' evaluations on centralised activities for a successful introduction of WBL in Latvia.

Furthermore, the authors have compared the arithmetic means of the obtained results as well as have analysed the entrepreneurs' and sector experts answers from the gender perspective. In addition the authors applied factor analysis to obtain a more thorough analysis.

Concerning the entrepreneurs' and sector experts evaluations on centralised activities for a successful introduction of WBL in Latvia - the entrepreneurs and sectors experts evaluated activities for a successful introduction of WBL in Latvia fairly high – average evaluations (mean, mode and median) were around 9 points (in evaluation scale 1 - 10), the evaluations were quite homogeneous (standard deviation). The entrepreneurs and sectors experts evaluated with the highest scores the following activities: "*support to the enterprise during the organisation of the work placement*" and "*tax reduction for enterprises involved in work-based learning*". The main statistical indicators of entrepreneur and sectors expert evaluations on activities for a successful introduction of work-based learning in Latvia are reflected in Table 1.

Table 1

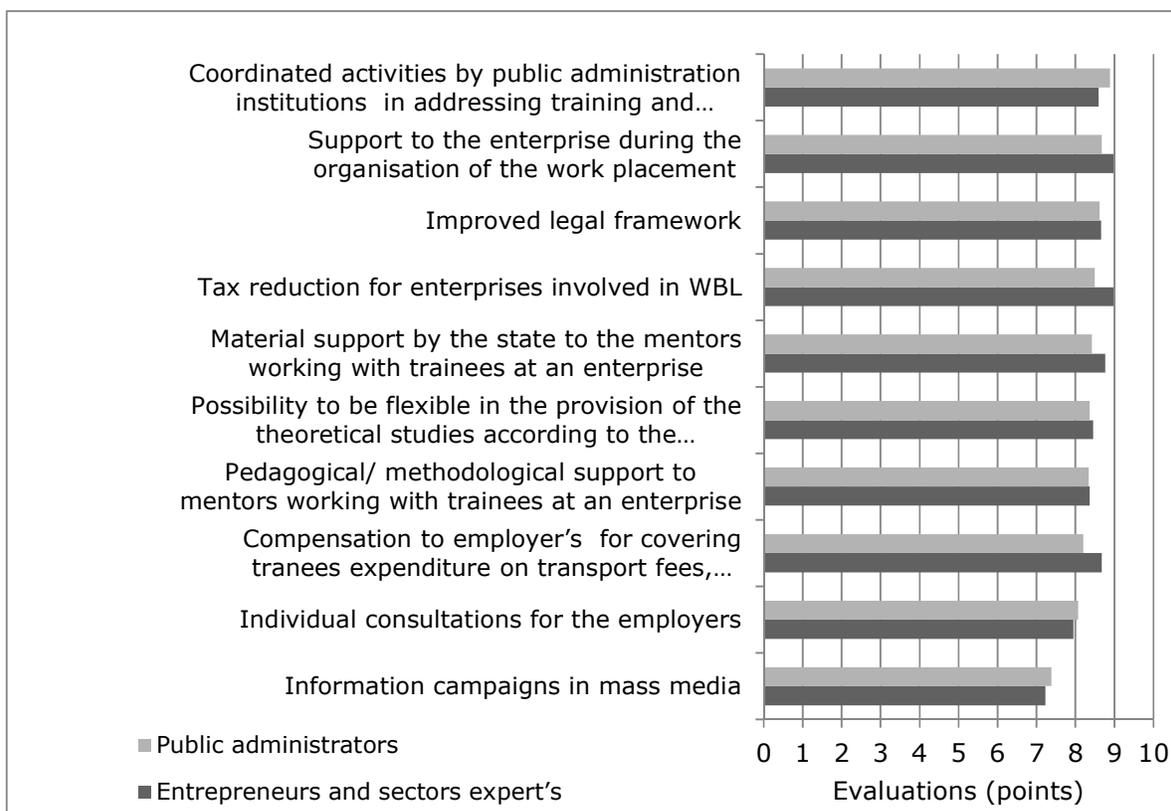
Statistical indicators of entrepreneurs' and sector experts evaluations on centralised activities for a successful introduction of work based learning (WBL) in Latvia

Activities	Arithmetic mean	Standard error of mean	Median	Mode	Standard deviation	Range	Minimum	Maximum
Support to the enterprise during the organisation of the work placement	8.98	0.106	9	10	1.530	9	1	10
Possibility to be flexible in the provision of the theoretical studies according to the employers needs	8.45	0.111	9	10	1.597	9	1	10
Individual consultations for the employers	7.94	0.133	8	10	1.918	7	3	10
Information campaigns in mass media	7.23	0.155	8	8	2.226	9	1	10
Material support by the state to the mentors working with trainees at an enterprise	8.76	0.114	9	10	1.633	9	1	10
Tax reduction for enterprises involved in work-based learning	8.97	0.130	10	10	1.864	9	1	10
Improved legal framework	8.66	0.116	9	10	1.667	8	2	10
Pedagogical/ methodological support to mentors working with trainees at an enterprise	8.37	0.133	9	10	1.915	8	2	10
Compensation to employer's for covering trainees expenditure on transport fees, specialised clothing etc.	8.67	0.134	9	10	1.930	9	1	10
Coordinated activities by public administration institutions in addressing training and employment issues	8.60	0.130	9	10	1.857	9	1	10

Source: author's calculations based on entrepreneurs and sectors experts survey conducted by Ilze Buligina in 2014, 2015 (n=249), evaluation scale 1 – 10, where 1 – not significant; 10 – very significant

Concerning the public administrators' evaluations on centralised activities for a successful introduction of WBL in Latvia – also the public administrators evaluated activities for a successful introduction of WBL in Latvia fairly high. The highest evaluations public administrators gave for analysed statements "coordinated activities by public administration institutions in addressing training and employment issues", and analysed statement "support to the enterprise during the organisation of the work placement".

The empirical data analysis showed that entrepreneurs and sectors experts slightly higher evaluated material support activities, public administrators – non-material support activities but all centralised activities for a successful introduction of work-based learning in Latvia have received relatively high evaluations both by entrepreneurs and sectors experts and by public administrators. The arithmetic means of public administrators and entrepreneurs and sectors expert evaluations on centralised activities for a successful introduction of work based learning in Latvia are reflected in Figure 1.



Source: author's calculations based on public administrators and entrepreneurs and sectors expert's surveys conducted by Ilze Buligina in 2014, 2015 (n=132) (n=249), evaluation scale 1 – 10, where 1 – not significant; 10 – very significant

Fig. 1. Arithmetic means of public administrators and entrepreneurs and sectors expert's evaluations on centralised activities for a successful introduction of work based learning in Latvia

The main statistical indicators of female and male evaluations on centralised activities for a successful introduction of work based learning in Latvia indicated that the results do not differ significantly by gender. Bigger differences for male and female evaluations were for evaluated statement "Information campaigns in mass media" and "Individual consultations for the employers" where evaluations by female respondents were bigger than for male respondents, but male respondents had bigger differences in their evaluations (indicated by indicators of variability).

For identifying the key factors – what centralised activities entrepreneurs and sectors experts consider as relevant for a successful introduction of work based learning in Latvia, and determining the mutual statistical relations of these factors by factor analysis. As a result of the factor analysis the initial ten factors, through

three iterations (by using the Varimax rotation with Kaiser Normalisation) are grouped in two complex factors (Table 2).

The interpretation of the identified complex factors with regard to the indicators with which the initial indicators have relatively high burdens:

- 1) **complex factor F1:** material and practical support. The factor has relatively high burdens on the following indicators: tax reduction for enterprises involved in work based learning, material support by the state to the mentors working with trainees at an enterprise, compensation to employers for covering trainees expenditure on transport fees, specialised clothing; support to the enterprise during the organisation of the work placement;
- 2) **complex factor F2:** information and pedagogic support. The factor has relatively

high burdens on the following indicators:
information campaigns in mass media,
pedagogical/methodological support to
mentors working with trainees at an
enterprise, individual consultations for the
employers, improved legal framework,

coordinated activities by public administration
institutions in addressing training and
employment issues, possibility to be flexible in
the provision of the theoretical studies
according to the employer's needs.

Table 2

**Entrepreneurs and sectors experts evaluations on centralised activities for a
successful introduction of work based learning in Latvia
(Complex factor matrix after rotation)**

Initial factors	Complex factors	
	F1	F2
Tax reduction for enterprises involved in work based learning	0.827	0.160
Material support by the state to the mentors working with trainees at an enterprise	0.785	0.202
Compensation to employer's for covering trainees expenditure on transport fees, specialised clothing etc.	0.771	0.150
Support to the enterprise during the organisation of the work placement	0.605	0.196
Information campaigns in mass media	-0.218	0.774
Pedagogical/methodological support to mentors working with trainees at an enterprise	0.271	0.681
Individual consultations for the employers	0.315	0.654
Improved legal framework	0.418	0.618
Coordinated activities by public administration institutions in addressing training and employment issues	0.251	0.612
Possibility to be flexible in the provision of the theoretical studies according to the employers needs	0.197	0.602
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Source: author's calculations based on entrepreneurs and sectors expert's survey conducted by Ilze Buligina in 2014, 2015 (n=249), evaluation scale 1 – 10, where 1 – not significant; 10 – very significant

Conclusions, proposals, recommendations

- 1) In Latvia work-based learning is a high level priority in the development of vocational education and training. This requires addressing the interests of the key involved parties.
- 2) Work-based learning is a common high-level EU VET priority. However, in each particular country it can be implemented by taking into consideration the specific socio-economic and education traditions of the country in question.
- 3) Well-considered centralised support measures are of major importance for a

- successful involvement of entrepreneurs in the implementation of work-based learning.
- 4) The empirical research showed that entrepreneurs and sectors experts slightly higher evaluated material support activities, the public administrators – non-material support activities but all centralised activities for a successful introduction of work based learning in Latvia have received relatively high evaluations both by entrepreneurs and sectors experts and by public administrators.
- 5) The opinions of public administrators and employers concerning the studied questions being fairly equal allow conclude that in Latvia

there is an equal level of awareness among these key stakeholders in relation to the key challenges and needed support measures to entrepreneurs.

6) The results of the study also testify to the capacity of the public administration to anticipate the actual needs of the entrepreneurs when initiating new policy approaches in VET.

7) The similar levels of awareness of the key stakeholders, among other things, may testify to the existing good co-operation among social partners in Latvia concerning the implementation of VET as well as to the capacity of the public administration to anticipate the actual needs of the entrepreneurs when initiating new policy approaches in VET.

Bibliography

1. Abukari, A. (2014). Pedagogical Beliefs in Work-Based Learning: an Analysis and Implications of Teachers Belief Orientations, *Research in Post-Compulsory Education*, Volume 19, Issue 4, pp. 481- 497.
2. Ahlgren, L., Lyn Tett, L. (2010). *Work-Based Learning, Identity and Organisational Culture*. *Studies in Continuing Education*, Volume 32, Issue 1, pp. 17-27.
3. Akkerman, S.F., Bakker, A. (2012). *Crossing Boundaries between School and Work during Apprenticeships*. *Vocations and Learning*, Volume 5, Issue 2, pp. 153-173.
4. Bathmaker, A.-M., Avis, J. (2005). *Becoming a Lecturer in Further Education in England: The Construction of Professional Identity and the Role of Communities of Practice*. *Journal of Education for Teaching*, Volume 31, Issue 1, pp. 47-62.
5. Billett, S. (1999). *Guided Learning at Work*. *Understanding Learning at Work*, Boud D., Garrick J., (eds), London: Routledge. pp. 151-164.
6. Billett, S. (2000). *Guided Learning at Work*. *Journal of Workplace Learning*, Volume 12, Issue 7, pp. 272-285.
7. Billett, S. (2001). *Learning through Work: Workplace Affordances and Individual Engagement*. *Journal of Workplace Learning*, Volume 13, Issue 5, pp. 209-214.
8. Blåka, G., Filstad, C. (2007). *How does a Newcomer Construct Identity? A Socio-Cultural Approach to Workplace Learning*. *International Journal of Lifelong Education*, Volume 26, Issue 1, pp. 59-73.
9. Burke, L., Marks -Maran, D.J. Ooms, A., Webb, M., Cooper, D. (2009). *Towards a Pedagogy of work based learning: perceptions of work based learning in foundation degrees*. *Journal of Vocational Education and Training*, Volume 61, Issue 1, pp. 15-33.
10. Coetzer, A. (2007). *Employee Perceptions of their Workplaces as Learning Environments*. *Journal of Workplace Learning*, Volume 19, Issue 7, pp. 417-434.
11. Eraut, M. (2004). *Informal Learning in the Workplace*, *Studies in Continuing Education*, Volume 26, Issue 2, pp. 247-273.
12. Fuller, A., Unwin, L. (2003). *Learning as Apprentices in the Contemporary UK Workplace: Creating and Managing Expansive and Restrictive Participation*. *Journal of Education and Work*, Volume 16, Issue 4, pp. 407-426.
13. Gibbs, P., Costley, C. (2006). *Work Based Learning; Discipline, Field or Discursive Space or What?*, *Research in Post-Compulsory Education*, Volume 11, Issue 3, pp. 341-350.
14. Greinert, W.-D. (2004). *European Vocational Training 'Systems' – The Theoretical Context of their Historical Development*. *European Journal of Vocational Training*, Volume 32, pp. 18-25.
15. McCormack, R., Pancini, G., Tout, D. (2010). *Learningful Work: Learning to Work and Learning to Learn*. *International Journal of Training Research*, Volume 8, Issue 1, pp. 40-52.
16. Messmann, G., Mulder, R.H. (2015). *Conditions for Apprentices' Learning Activities at Work*. *Journal of Vocational Education and Training*, Volume 67, Issue 4, pp. 578-596.
17. Pang, P. (2015). *Learning to Work during Work Placement: Negotiating Access to Work and Participation through 'Origination' and Establishing a 'Legitimate Presence'*. *Journal of Vocational Education and Training*, Volume 67, Issue 4, pp. 543-557.
18. Tanggaard, L. (2005). *Collaborative Teaching and Learning in the Workplace*. *Journal of Vocational Education and Training*, Volume 57, Issue 1, pp. 109-122.
19. The Riga Conclusions (2015) endorsed by ministers from the European Union (EU) Member States, candidate countries, Iceland, Norway and Liechtenstein as the new medium-term deliverables for vocational education and training 22.06.2015 in Riga, Latvia – during the Latvian Presidency in the Council of the European Union. Retrieved: http://ec.europa.eu/education/policy/vocational-policy/doc/2015-riga-conclusions_en.pdf Access: 14.12.2015
20. Wieland, C. (2015). *Germany's Dual Vocational-Training System: Possibilities for and Limitations to Transferability*. *Local Economy*, Volume 30, Issue 5, pp. 577-583.

LOGISTICS IMPROVEMENT POSSIBILITIES IN ENTREPRENEURSHIP

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Abstract. Nowadays, the harmonised and rational performance of logistics in a competitive environment is essential for entrepreneurship to reduce costs and accordingly gain advantages on the market. Besides, it is necessary to achieve a maximum level of service for customers – to make deliveries within the specified time and at high quality. The research aim is to examine logistics management for freight deliveries by DSG Karjeri LLC and to identify possibilities to improve its logistics operations. Three logistics management scenarios for freight deliveries were designed to achieve the aim. The scenarios envisage that the company outsources transport services, rents vehicles or purchases vehicles. The research found that the purchase of lorries used for freight deliveries would result in savings within a range EUR 4000-25000 a year as well as the company would provide timely and quality freight deliveries.

Key words: logistics, scenarios, logistics management.

JEL code: L91, R40.

Introduction

Nowadays, under a market economy, the role of logistics increases and problems related to it emerge as well. It is necessary, on the one hand, to achieve a maximum level of service for customers (to make deliveries within the specified time and at high quality), while, on the other hand, to minimise service-related costs. Timely deliveries and precision factors are particularly essential for companies whose basic activity relates to the transport of products (Patlins P., 2011). The problem is urgent due to the role an efficient transport system plays in entrepreneurship as well as the fact that the market economy raises standards for timely deliveries and cost reductions in transport. Furthermore, in a competitive environment companies have to seek to achieve cost reductions and hence advantages on the market; that is why harmonised and rational operation assists in achieving not only advantages in terms of cost but also in the flexible functioning of the entire logistics system (Ozolins D. and Kruzs K., 2005).

Any company has to plan its economic activities and a great deal of its activities relates particularly to logistics processes. A number of scientists have focused on logistics; thus, this term is analysed from different perspectives. From the scientific perspective, logistics is a science focusing on the management of the flow of material valuables and the related flow of

information in certain micro- and macroeconomic systems to achieve the objective set (Praude V. & Belcikovs J., 2003). However, from the management perspective, logistics involves the planning, management and control of economic activities. It provides the purposeful maintenance of material valuables and their delivery from the production site to consumers as well as other related activities regarding their flow and the related flow of information, aiming to raise performance efficiency and meet consumer needs (Krumina A., 2005). According to findings in scientific literature, effective logistics management allows customers of a company to be served at high quality by timely delivering their products as well as efficiently exploiting the company's resources and minimising their maintenance costs even in cases of change in customer demand (Patlins P., 2011). The research sets the following **hypothesis**: effective logistics management is a basis for company cost reductions. The research object is company DSG Karjeri LLC, which deals with dolomite quarrying and the production of crushed stone; the company's daily operation is associated with logistics management.

The research **aim** is to examine logistics management for freight deliveries by DSG Karjeri LLC and to identify possibilities to improve its logistics operations. To achieve the aim, the following specific research **tasks** were set:

1) to describe the theoretical aspects of logistics;

2) to analyse the logistics management of DSG Karjeri LLC for freight deliveries and to identify possibilities to improve its logistics operations.

The following **research methods** were employed: the monographic and descriptive methods were applied to describe the role of logistics nowadays as well as to examine the logistics management process in DSG Karjeri LLC; the scenario method was used to identify the most economically efficient way of transport of freight for DSG Karjeri LLC: contracting an outsourcing provider (purchase of outsourcing services), renting vehicles or purchasing vehicles. The scenario method is appropriate in cases where a company has to prepare for some risks and opportunities in the future, given the effects of various factors on different scenarios (Zurek M. B. and Henrichs T., 2007). This method is useful in the present research to choose the most economically efficient logistics management solution based on each scenario's advantages and disadvantages.

The research used unpublished and informative materials of DSG Karjeri LLC as well as scientific literature on the theoretical aspects of logistics.

Development and role of logistics in entrepreneurship

Logistics has a long history, and its practical application originated in Ancient Greece (776 BC - 323 AD) when the term logistics referred to supplies for the army and displacement (Radzele-Sulce A., 2011). However, the scientific literature refers to J.Crowell as the first author who defined logistics and its key principles in his 1901 report on the flow of goods, costs and efficiency (Stock J. and Douglas L., 2000). The modern scientific literature provides a number of definitions of the term logistics, which involve a narrow or a broad

range of issues researched. Most often, logistics is understood and described as deliveries of goods to customers; yet, logistics is also necessary to produce the goods to be delivered. Logistics is also defined as a science focusing on the management of the flow of material valuables and the related flow of information in certain micro- and macroeconomic systems to achieve the objective set (Praude V. & Belcikovs J., 2003). However, D. J. Bowersox and D. J. Closs (1996) believe that the object of logistics may be defined as flows of materials that are in place both within a company and among companies, intermediaries and financial institutions. A. Radzele-Sulce (2011), summarising a number of definitions given by scientists, points that logistics involves efficient uses of resources, flows of material valuables and information, a process of planning consumption sites, sales and control aimed at meeting customer needs and increasing an company's profit. As noted by I. Slavinska (2007), most companies associate the term logistics only with the most obvious part of it – the provision of transport services.

Efficient logistics plays a significant role in entrepreneurship, as it reduces the total cost of transport and logistics services by up to 30%, managing the operation of a company's units as rationally and coordinately as possible (Urbahs A. and Cerkovnuks A., 2003). Logistics is also important in serving clients and buyers (Sergeyev V.I., 2005). It is important for buyers that the seller is continuously searching for the best solutions in communication, deliveries of materials and the process on the whole (Bowersox D. J. and Closs D. J., 1996; Heskett J. L. et al., 1990). All this may be provided through effective logistics in an company. An analysis of findings on the role of logistics by a number of authors allows concluding that logistics is important not only in reducing costs and serving customers but also in time planning – both for production and for

deliveries of goods. Globalisation created a need to perform deliveries as fast as possible, thus, not freezing assets during the delivery process (Sprancmanis N., 2011). As pointed by I. Slavinska (2007), in globalised economies companies can successfully develop and compete particularly through effective logistics management. To identify the possibilities to improve logistics management, the present research analysed company DSG Karjeri LLC, focusing particularly on the management of transport services in the company.

Characteristics of the logistics process in DSG Karjeri LLC

DSG Karjeri LLC was founded on 2 June 2005; its key activity involves dolomite quarrying and the production of crushed stone but it also sells other mineral materials, as the company buys sand, gravel and clay from other quarrying companies. DSG Karjeri LLC has opened four dolomite fields – at Iecava, Saikava, Birzi and Ape –; yet, it plans to open 11 more dolomite fields until 2020 in the entire territory of Latvia, thereby increasing its sales by 5 % until 2020.

An essential role in selling the dolomite produced and the materials bought is played by effective logistics management in DSG Karjeri LLC, as most of its customers prefer the materials they have bought to be delivered to their construction object. Also, the company uses logistics services for its own needs – for the transport of materials quarried, machinery, employees and materials bought.

The head of the Production Department and sales employees are involved in managing the logistics process in DSG Karjeri LLC. The head of the Production Department arranges the relocation of machinery and mobile teams among quarries, planning the necessary production intensity at every quarry and for every period. Sales employees work on delivering the company's products to customers; they also plan product purchases for customers, i.e. the loading

of products at other quarries and their delivery to the customer's object at a specified time.

Since DSG Karjeri LLC does not have its own vehicles to deliver its products, it contracts other companies that provide transport services. This means that the most reliable provider of transport services has to be selected for every delivery site, which is ready to do it for the price agreed with the customer. In addition, a sales employee has to correctly calculate the distance from a quarry, from which products are delivered, to the customer's site, so that when agreeing on the price with the customer, there are no doubts the company is able to sell the material and contract a provider of transport services for the revenue earned. During the active season, mistakes are often made in calculations of prices for customers; consequently, if an incorrect calculation are performed, customers have to often pay for transport. However, no price change is allowed for deliveries of products in large quantities – the lowest price set by the company is often the reason why customers decide to buy the products particularly from DSG Karjeri LLC.

In 2015, DSG Karjeri LLC cooperated with 15 providers of transport services, and the cooperation with most of them continues in 2016. Important criteria in the choice of a transport company are the price for kilometrage set by the company, the distance from the company's site to the production site of DSG Karjeri LLC, the reliability of the company based on previous cooperation with it and the company's accuracy and timelines in making an invoice for the service it provides.

On the whole, logistics management is effective in DSG Karjeri LLC; yet, the company has to examine its possibilities to improve its logistics processes (transport) in order to reduce its costs.

Logistics improvement possibilities in DSG

Karjeri LLC

Transport in business may be performed in three ways: contracting an outsourcing provider (purchase of outsourcing services), renting vehicles or purchasing vehicles. Three scenarios were analysed to identify the most optimum one for the situation of DSG Karjeri LLC.

Scenario A: purchase of outsourcing services. At present, DSG Karjeri LLC outsources transport services; yet, contracting an outsourcing provider involves several advantages and disadvantages.

Transport companies are not sufficiently flexible in time; in the result, the company may lose revenue, as any customer can find another seller that can also deliver the product. An opposite situation is also likely, i.e. idling. Idling is possible if a contracted transport company waits for the freight to be loaded or for unloading it at the site. In 2014, the company's expenses due to idling totalled EUR 300.00.

One of the greatest disadvantages of outsourcing transport services is the motivation of employees to do a good job, i.e. to deliver the freight to the customer's site and collect all signatures of the construction manager on transport waybills. DSG Karjeri LLC has experienced situations where a customer did not accept the delivery of the freight just because he/she had not put a signature on the transport waybill. In such cases problems emerge with providers of transport services – if the customer refuses to accept the freight, DSG Karjeri LLC reserves its right not to accept a transport invoice if the transport company has not done its job properly. One can conclude that there are problems with employee motivation, which cannot be controlled by the buyer of transport services.

A significant disadvantage regarding buying transport services relates to the time factor. Delivering the product from distant quarries, the provider of transport services is not always

located close to the site, which does not make deliveries as fast as possible. However, if the company has its own vehicles, it can timely plan trips, making kilometrage more rational. In addition, the company pays for transport services during idling – the time the transport company spent to load or unload the freight at the site.

One of the largest advantages relates to maintenance and repair costs for vehicles. In case the company chooses to buy transport services, it is responsible for annual vehicle roadworthiness tests and has to pay road taxes. If some transport company refuses to do a trip because its vehicle has to be repaired, the buyer of transport services can contact another transport company and deliver its products in any case. Also, the use of funds of another company is also an important advantage. The company, buying transport services, uses the funds of the other company to fulfil its obligations to clients. Any provider of transport services invests its funds at the moment when providing the services and receives its funds earned in a month or even later. An advantage is also the control of employees if buying transport services, i.e. hours worked, rest periods and kilometrage do not have to be controlled.

Scenario B: renting vehicles. The research analyses annual maintenance costs for a lorry if the lorry is rented. A provider of transport services whose fleet consists of four leased used lorries SCANIA R420 (a tractor-trailer) is analysed as the research object. The lorries have trailers for transporting loose bulk freight. The company transports the mentioned kind of freight and is one of the most frequently contracted partners by DSG Karjeri LLC.

An examination of the financial performance of the company allows finding that the greatest per unit cost concerning the maintenance of rented lorries relates to rental costs, namely, EUR 24900.25 a year (Table 1).

Table 1

Maintenance costs for a lorry SCANIA R420 a year, EUR

Indicators	Costs	
	EUR	Proportion, %
Wages	5000.00	7.47
Fuel	24036.50	35.92
Repairs	7714.25	11.53
Road Traffic Safety Directorate roadworthiness tests	510.75	0.76
Rental costs	24900.25	37.21
Tyres	4763.00	7.11
Total cost	66924.75	100

Source: authors' calculations

In case of need, a renter covers such costs as overhauls and insurance. No overhauls have been performed for the SCANIA lorries during the last three years. In contrast, the cost of daily repairs is covered by the lessee. In 2014, the repair cost per lorry totalled EUR 7714.25, which accounted for 11.53% of the total cost per lorry a year. The total maintenance cost per lorry amounted to EUR 66924.75 in 2014.

The authors calculated an approximate kilometrage, given the average diesel fuel price (value added tax excluded) per litre in 2014 and the fuel cost per lorry purchased and used in freight deliveries by the following formula:

$$D_1 * P = L \quad (1)$$

where

D_1 – fuel cost per lorry used in freight deliveries (value added tax excluded) (EUR);

P – diesel fuel cost (value added tax excluded) (EUR/l);

L – amount of fuel used in freight deliveries (l).

The amount of diesel fuel consumed is calculated by dividing the cost of fuel by the average diesel fuel price in 2014, which was 0.90 EUR/litre; it totalled 26707.22 litres. It means that a lorry consumed about 26707.22 litres of diesel fuel for freight deliveries. Further, the authors calculate kilometrage for 2014 by the formula:

$$D_a / P_a = R \quad (2)$$

where

D_a – average fuel consumption (l/km);

P_a – average price set by providers of transport services (EUR);

R – kilometrage (km).

It is assumed that the average fuel consumption per lorry is 35 l per 100 km. One can find that about EUR 66924.75 were required to provide transport services and maintain a lorry that travelled 76306.34 km in 2014. Accordingly, if the kilometrage of the lorry is greater, the cost of maintenance and repairs also rises. It has to be noted that this cost includes a rental cost of EUR 24900.25, which would not be paid if the lorry were owned by the company.

In 2014, the lowest price per kilometre asked by transport providers contracted by DSG Karjeri LLC was EUR 0.93, while the highest price reached EUR 1.20. In a situation where DSG Karjeri LLC has to maintain a lorry whose total cost is EUR 66927.75 a year and kilometrage is 76306.34 km, it is not efficient to outsource transport services. If it sets its own price at EUR 0.93 per kilometre, the cost of transport at a kilometrage of 76306.34 km is EUR 70964.90.

Table 2 provides a comparison of data to identify the gains from kilometrage if the company has to pay for kilometrage at a rate of 0.93 EUR/km and at a rate of 1.20 EUR/km. In the comparison, the rate of EUR 0.93 per

kilometre is selected as the lowest price of transport providers contracted by DSG Karjeri LLC and the rate of EUR 1.20 per kilometre represents the highest price DSG Karjeri LLC has paid if outsourcing transport services. It is assumed that the annual cost of a rented lorry at a kilometrage of 76306.34 km totals EUR 66925.

The calculations show that the higher the average price per kilometre set by a transport provider, the more efficient it is for the company to rent itself a lorry for freight deliveries (Table 2).

Table 2

**Comparison of situations if renting a vehicle or if outsourcing transport services
(at a rate of 0.93 EUR/km or 1.20 EUR/km)**

Situation	Kilometrage, km (76306.34)	Savings if renting a vehicle (EUR)
Price for kilometrage if buying transport services at a rate of 0.93 EUR/km	70965 EUR	4040
Price for kilometrage if buying transport services at a rate of 1.20 EUR/km	91568 EUR	24643
Maintenance costs if renting a vehicle	66925 EUR	-

Source: authors' calculations

According to Table 2, the purchase of a lorry results in savings: the higher the average market rate paid for kilometrage, the greater savings. If the average rate set by transport providers equals EUR 0.93 per kilometre, a saving reaches about EUR 4000. At an average market rate of EUR 1.20 per kilometre, a saving is considerably greater – approximately EUR 24000 a year.

Scenario 3: purchasing vehicles. The third scenario examines the purchase of a lorry SCANIA R420. Own vehicles can bring extra direct revenues for the company by providing additional transport services to other companies (as not only own products are delivered). The company plans to buy a SCANIA R420 (a lorry of the same version that was rented by the company and whose characteristics were employed in the calculations). Such lorries were often present in the fleets of transport companies contracted by DSG Karjeri LLC. The second most popular brand was VOLVO; such lorries were less

frequently operated than SCANIA lorries. A market study revealed that the average price of a lorry was EUR 21150 (value added tax excluded). Table 3 presents calculation results for a situation if the company has purchased a SCANIA R420 at the mentioned average market price of EUR 21150.

For financial needs, the depreciation rate for a lorry is set at 20 %. A monthly cost of fuel was calculated based on the annual kilometrage of 76306.34 km and the monthly kilometrage of 6358 km, given the fuel consumption per lorry was 35 litres per 100 kilometres and the average diesel fuel price was EUR 0.95 per litre. Repairs, Road Traffic Safety Directorate services and tyre repairs were calculated based on the real annual total cost (data provided by a company having four lorries based on a rental contract). According to the calculations, the monthly cost per lorry equals EUR 3993.79, which makes up an annual cost of EUR 47925.48.

Table 3

Maintenance and related costs for a lorry SCANIA R420 a month, EUR

Indicator	Cost, EUR
Lorry depreciation	352.50
Fuel	2114.04
Wages	444.92
Repairs	642.83
Road Traffic Safety Directorate services	42.58
Tyres	396.92
Total cost	3993.79
Total cost (depreciation excluded)	3641.29

Source: authors' calculations

According to Table 1 showing that the total cost per lorry amounts to EUR 66924.75 a year, the purchase of a SCANIA R420 could result in a saving for the company at approximately EUR 18000 a year. The company, of course, can reduce its profit, becoming, for example, an attractive employer for lorry drivers through raising wages from the minimum wage up to a decent wage. In addition, the company could afford to pay bonuses to its employees for kilometrage to motivate the employees and to raise the quality of their work.

The company has to provide its new vehicles with devices that help identify precise arrival times for loading freight at a quarry as well as send information to clients about freight deliveries to the site at a specified time. The vehicles owned by the company could help maximally use lorry operating hours as well as provide timely freight deliveries.

The examination of logistics processes in the company reveals that it is useful for DSG Karjeri LLC to purchase vehicles for efficient logistics management, which allows it to reduce costs.

Conclusions, proposals, recommendations

1) Logistics plays an essential role in entrepreneurship, it allows reducing total costs, contributes to clients' satisfaction with the quality of services provided and promotes rational time planning in production and

freight deliveries, thereby raising any companies' competitiveness.

2) DGS Karjeri LLC was analysed to examine possibilities to improve logistics management; its key activity involves dolomite quarrying and the production of crushed stone. DGS Karjeri LLC owns no vehicles for freight deliveries; thus, it contracts companies providing transport services, which leads to a number of disadvantages – the quality of work done by employees of the companies is low and there is no flexibility in time. It incurs extra costs and losses to the company.

3) To identify the possibilities to improve logistics in DGS Karjeri LLC, three scenarios were designed: purchasing outsourcing services, renting vehicles or purchasing vehicles. The research revealed that purchasing vehicles for freight deliveries could save funds ranging from EUR 4000 to 25000 a year (based on the average transport provider price for kilometrage) as well as the company would provide timely and quality freight deliveries.

4) A member of the executive board of DGS Karjeri LLC has to buy lorries for freight deliveries in order to raise profits, better serve clients and provide flexible delivery times. The lorries have to be equipped with special devices helping identify the locations of the lorries as well as plan deliveries within a

specified time, thereby efficiently exploiting the lorries and their driver working hours.

5) The transport dispatcher of DSG Karjeri LLC has to ensure that the purchased lorries

are operated to meet the needs of DSG Karjeri LLC and to provide transport services to other companies, thus, earning extra revenues.

Bibliography

1. Bowersox, D. J., Closs, D. J. (1996). *Logistical Management*. London: The McGraw-Hill Companies. p. 645.
2. Heskett, J. L., Sasser, W. E., Hart, C. W. L. (1990). *Service Breakthroughs: Changing the Rules of the Game*. New York: The Free Press. p. 389.
3. Krumina, A. (1997). *Logistics Strategic Planning as an Element of the System of a Company's Strategic Planning*. In: Scientific papers University of Latvia, Economics IV, Volume 689. pp. 161-175.
4. Stock, J., Douglas, L. (2000). *Strategic Logistics Management*. New York: The Free Press. p. 312.
5. Ozolins, D., Kruzs, K. (2005). *Perspectives of Transport Logistics Development in Latvia*. In: Scientific papers University of Latvia, Economics IV, Volume 689, pp. 239-251.
6. Patlins, P. (2011). *Road Transportation Planning Optimization within Logistic System*. Summary of the Doctoral thesis. Riga: RTU Izdevnieciba. p. 37.
7. Praude, V., Belcikovs, J. (2003). *Logistics (in Latvian)*. Riga: Vaidelote. p. 277.
8. Radzele-Sulce, A. (2011). *Economic Benefits of Logistics Application in the Agriculture Sector*. Summary of the Doctoral thesis. Jelgava. p. 72.
9. Slavinska, I. (2007). *The Role of Logistics in Improving Performance of Local Governments*. Proceedings of the Latvia University of Agriculture, Volume 19, Issue 314, Jelgava. pp. 62-75.
10. Sprancmanis, N. (2011). *Basics of Business Logistics (in Latvian)*. Riga: Burtene. p. 219.
11. Urbahs, A., Cerkovnuks, A. (2003). *Intermodal Container Transport (in Latvian)*. Riga: RTU izdevnieciba. p. 496.
12. Zurek, M. B., Henrichs, T. (2007). *Linking Scenarios across Geographical Scales in International Environment Assessments*. Technological Forecasting and Social Change, Volume 74, No. 8, pp. 1282-1295.
13. Sergejev, V.I. (2005). *Corporate Logistics: 300 Answers to Questions of Professionals (in Russian)*. Moscow: Infra-M, p. 976.

ARE POLISH RURAL AREAS DESTINATIONS FOR COMMUTING?

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Abstract. Rural areas in Poland have faced significant changes recently. The primary sector has been decreasing its contribution to local employment. The aim of the paper is to identify to what extent rural areas in Poland are destinations for incoming commuters. The degree of urbanisation (DEGURBA) framework was used as a reference for an urban-rural typology of local units. The National Census of Population and Housing 2011 provided the most recent data on commuting in municipalities of Poland.

A statistical analysis with use of the V Cramer coefficient proves a strong relationship between a type of local unit and a number of incoming commuters and a medium relationship between a type of local unit and density of incoming commuters. Generally, urban local units tend to attract the highest number of commuters. Rural areas attract relatively less commuters – the number of rural local units decreases as one considers a higher number of commuters. However, there exist some exceptions of intermediate and rural local units where a significant number of commuters work because of their localization close to big cities or some specific activities located there.

Key words: rural areas, commuting, DEGURBA.

JEL code: J61, R23

Introduction

Polish rural inhabitants have been facing many challenges connected with the economy's transformation, including a decrease of the primary sector's role and the development of other, non-agricultural functions of rural areas. These processes contribute to changes in the labour market (Drejerska N., 2010). There are clear differences in the employment rate between thinly-populated and densely-populated areas in Poland (Drejerska N., 2014). The demographic and financial situation of rural population is largely determined by the distance between place of residence and a large urban centre. Rural areas located near large cities can be characterized by higher population density, high positive net migration and lower share of the unemployed in comparison to remote rural areas (Central Statistical Office of Poland, Statistical Office in Olsztyn, 2013).

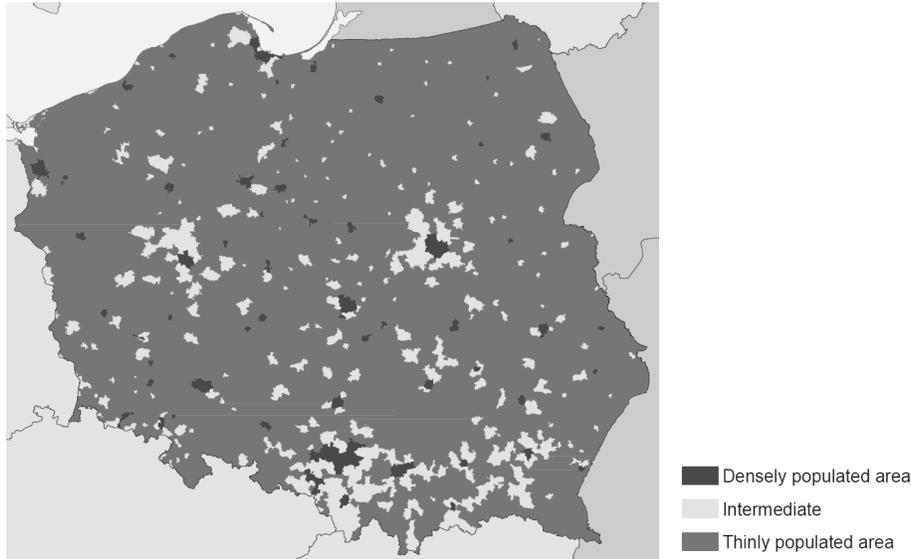
The aim of the paper is to identify to what extent rural areas in Poland are destinations for incoming commuters. The following specific research tasks have been set: 1) to investigate a relationship between a local unit's type (urban-rural) and a number and density of incoming commuters; 2) to visualise data on commuting to rural areas on maps and to interpret spatial patterns. In such an approach, rural areas are

treated as a starting point of the research process and an ability to attract incoming commuters means a sign of development potential. This relation results from perception of labour market as an element of socio-economic development of rural municipalities (Wojewodzka-Wiewiorska A., 2014). This topic is also especially important as urban and regional development studies have tended to focus on urban centres (Gorecka A., 2015) as the driving forces in innovation and growth, with surrounding rural areas cast in a passive and residual role (Ward N., Brown D. L., 2009). Historically, cities were treated as places playing a role of socio-economic centre offering employment (Rakowska J., 2014).

The first step, before the main analysis, is to clearly define what types of territories are considered as rural. There are many various classifications used for different purposes. For this study, the author applied the degree of urbanisation (DEGURBA). DEGURBA methodology distinguishes the following types of territories (Eurostat, 2015):

- **high-density clusters (or city centre):** contiguous grid cells of 1 km² with a density of at least 1 500 inhabitants per km² and a minimum population of 50 000;

- **urban clusters:** clusters of contiguous grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5 000;
- **rural grid cells:** grid cells outside urban clusters.



Source: Eurostat, 2015: Correspondence table - Degree of Urbanisation (DEGURBA) - Local Administrative Units. Retrieved: http://ec.europa.eu/eurostat/ramon/miscellaneous/index.cfm?TargetUrl=DSP_DEGURBA. Access: 10.12.2015

Fig. 1. **Degree of urbanization (DEGURBA) in Poland in 2011**

The degree of urbanisation creates a three-way classification of LAU2s¹ as follows:

- 1) densely populated area (alternate name: cities or large urban areas): at least 50 % lives in high-density clusters;
 - 2) intermediate density area (alternate name: towns and suburbs or small urban areas): less than 50 % of the population lives in rural grid cells and less than 50 % lives in a high-density cluster;
 - 3) thinly populated area (alternate name: rural area): more than 50 % of the population lives in rural grid cells.
- 4) According to the Eurostat data, a structure of inhabitants aged 20-64 in particular types of DEGURBA areas in 2014 was as follows:
- 41 % in cities in the EU (36 % in Poland);
 - 32 % in towns and suburbs in the EU (24 % in Poland);

- 27 % in rural areas in the EU (41 % in Poland).

It can be seen that a proportion of inhabitants in rural areas in Poland is significantly higher than on average in the EU. It can be a further reason for investigation of labour market on rural areas and its potential to absorb commuters.

The National Census of Population and Housing 2011 provided data on commuting for the year 2011. It results in using DEGURBA classification for the year 2011 (Eurostat, 2015) (Figure 1) as a reference.

Statistical analyses were carried out with use of the V. Cramer's coefficient to examine the relationship (correlation) between the type of local unit according to degree of urbanisation and:

- the scale of incoming commuting;
- density of commuters per 1 km² of build-up and urbanized areas.

¹ LAU 2 - Local Administrative Units 2, formerly NUTS level 5.

Table 1

Descriptive statistics for the number of incoming commuters across local units

Number of local units		2908	
Number of incoming commuters (persons)	Average	948	
	Minimum	10	
	Maximum	271392	
	Percentiles	20	48
		40	115
60		247	
80		666	

Source: author's calculations based on data of National Census of Population and Housing 2011, Central Statistical Office of Poland

Table 2

Degree of urbanisation (DEGURBA) vs. percentiles of incoming commuters

DEGURBA	Percentile	20	40	60	80	100	Total
		number of local units	0	0	0	0	73
1 – urban area	% of DEGURBA	0	0	0	0	100	100
	number of local units	21	31	74	134	308	568
2 – intermediate area	% of DEGURBA	4	5	13	24	54	100
	number of local units	554	556	505	450	202	2267
3 – rural area	% of DEGURBA	24	25	22	20	9	100
	number of local units	575	587	579	584	583	2908
Total	% of total	20	20	20	20	20	100

Source: author's calculations based on data of National Census of Population and Housing 2011, Central Statistical Office of Poland



Source: author's calculations based on data in Table 2

Fig. 2. A scale of commuting in rural areas according to percentiles of incoming commuters

The choice of the coefficient was conditioned by the kind of data – the V. Cramer's coefficient allows comparison of categorical variables and it is the most useful one when variables have more than two categories (Field A., 2009).

Research results and discussion

The National Census of Population and Housing 2011 provided data for 2908 local units¹ in Poland on a number of commuters working there (incoming commuters). Available results include units with flows more than 9 persons, so the minimal number of commuters is 10. The maximum is represented by the Polish capital, at the same the largest Polish city, Warsaw (Table 1).

Generally, it should be concluded that majority (60 %) of local units attract not more than 247 commuters. This scale of incoming commuting in particular unit can be treated as an equivalent of employment in a medium enterprise². A group of the first ten units with the highest number of incoming commuters consists of Warsaw, Katowice, Krakow. Poznan, Wroclaw, Lodz, Rzeszow, Gdansk and Lublin (regional capitals) as well as Bielsko-Biala.

Data on commuting (Table 2) proves that urban areas attract commuters to a most significant extent. All local units with 20% of the highest number of incomings have urban character according to DEGURBA. There are some rural units attracting many incoming commuters; they are located near regional capitals, for example Wroclaw, Zielona Gora, Poznan, also Warsaw (Figure 3).

In order to verify if there is a statistically important relationship between a scale of commuting (expressed according to percentiles of number of incoming commuters) and a character of a local unit, the author calculated the

V. Cramer coefficient. To calculate it, only intermediate and rural areas were taken into account as urban areas represented only a largest scale of commuting. For 2835 local units, the V. Cramer coefficient has the value of 0.503 with the level of significance $p < 0.001$. The V. Cramer's coefficient lies in the interval $< 0; 1 >$, where 0 means no association and 1 perfect association. Some references suggest the following interpretation (Sheskin D. J., 2011):

- $< 0.1; 0.3 >$ – small relationship;
- $< 0.3; 0.5 >$ – moderate relationship;
- $< 0.5; 1 >$ – strong relationship.

As a result it can be concluded that the calculated value of the V. Cramer's coefficient indicates a strong relationship between a character of a local unit and a scale of attracting commuters. Local units characterized as intermediate areas tend to attract more incoming commuters – more such units represent higher numbers of commuters. Rural areas attract relatively less commuters – the number of rural local units decreases as one considers a higher number of commuters.

As local units are diversified across Poland in terms of their area, so the next step of the analysis is to check if the scale of incoming commuters can be conditioned by a physical area of particular local unit. In other words, to check if simply larger local units attract a greater number of incoming commuters. In such a situation, a type (rural or urban) does not matter because the primary relation lies between the area of a local unit and the number of incoming commuters. In order to verify it, a density of incoming commuters was calculated as a number of commuters per 1 km² of build-up and urbanized areas of particular local unit (Table 3).

¹ LAU 2 (Local Administrative Units 2, formerly NUTS level 5) as well as their urban and rural parts in case of those which have an administrative urban-rural character.

² As according to the EU recommendation, a medium-sized enterprise has 50-250 staff headcount.

Table 3

Descriptive statistics for the density of incoming commuters across local units

No of local units		2908	
Density of incoming commuters (persons/km²)	Average	120	
	Minimum	1	
	Maximum	2534	
	Percentiles	20	13
		40	33
60		75	
80		191	

Source: author's calculations based on data of National Census of Population and Housing 2011, Central Statistical Office of Poland

Generally, it can be concluded that majority (60 %) of local units attract not more than 75 commuters per 1 km² of build-up and urbanized areas. It should be noticed that in the case of the density, there is not so straight relationship that the largest cities can be characterized by a higher density of commuters. In the ranking of the highest density, a group of first ten local units includes only two urban units (one of them is Warsaw), four intermediate and four rural local units. One reason which can lie behind this result is a specific character of the economy in some of these units. For example, there are two units, where coal mines are located. These types of large activities attract not

only local inhabitants but also commuters from other local units. Moreover, providing analyses on such a low level of territorial division, it is necessary to stress that rural areas, even distinguished basing on the LAU 2 level, are not uniform. Intermediate rural areas, being more or less connected to cities, often show a positive development. At the same time, more peripheral rural regions are in a worse position because of some general characteristics that limit their potential to gain from smart growth policies, such as lack of scale in their population and industrial base and limited access to markets (Naldi L. et al., 2015).

Table 4

Degree of urbanisation (DEGURBA) vs. density of incoming commuters

DEGURBA		Percentile					Total
		20	40	60	80	100	
1 – urban area	number of local units	0	0	0	18	55	73
	% of DEGURBA	0	0	0	25	75	100
2 – intermediate area	number of local units	17	28	90	177	256	568
	% of DEGURBA	3	5	16	31	45	100
3 – rural area	number of local units	543	563	503	385	273	2267
	% of DEGURBA	24	25	22	17	12	100
Total	number of local units	560	591	593	580	584	2908
	% of total	20	20	20	20	20	100

Source: author's calculations based on data of National Census of Population and Housing 2011, Central Statistical Office of Poland

The relationship between the number of commuters and the type of a local unit confirmed before can be also true for density of incoming commuters (Table 4). Numbers of urban and intermediate local units are higher in a group of

units representing higher density of incoming commuters. As far as spatial patterns of density of incoming commuters are concerned, neighbourhood to big cities is not so obvious (Figure 3).



Source: author's calculations based on data in Table 4

Fig. 3. Density of incoming commuters in rural areas according to percentiles

Rural local units with high density of incoming commuters represent towns (no big, classified as rural according to DEGURBA). They are parts of municipalities which have urban-rural character from administrative point of view in Poland. Consequently, they are marked on very small territories and cannot be clearly seen on the map of the whole country.

In order to verify if there is a statistically important relationship between density of incoming commuters and a character of a local unit, the author calculated again the V Cramer coefficient. For 2835 local units, it has the value of 0.423 with the level of significance $p < 0.001$. It indicates the moderate relationship between the type of a local unit and density of commuters it attracts to.

Discussing detailed results of this research with results for other European countries can be difficult as many of economic studies refer to the urban-rural regional typology. This typology divides European regions (NUTS 3) into three

types: predominantly rural, intermediate and predominantly urban. As a result, it is not possible to compare with division of local units (municipalities). It also means that much more economic data are accessible for this regional typology. However, the data collected for rural areas are linked to the data collected for rural regions as they are both defined by the share of population in rural grid cells (Dijkstra L., Poelman H., 2014).

Coming back to commuting to rural areas, it can be a part of the phenomena of reverse commuting, which was identified by many scientists, e.g. in Paris (Aguilera A., et al., 2009) or Madrid where researchers investigated new sub-centres in the suburban ring and commuting (Garcia-Palomares J. C., 2010). This of course applies to rural areas close to cities or towns and suburbs where a process of sprawl of economic activities outside of cities or even their suburbs takes place. Similar processes take place for logistic centres located close to a city but outside

city's borders because of lower land prices and acceptable accessibility. This explanation has limited application in this case as usually there are intermediate density areas between cities and rural areas according to the DEGURBA classification. However, such a pattern can be identified (Figure 3); rural local units with highest numbers of incoming commuters are located near regional capitals, as for example Bydgoszcz, Wrocław or Poznań.

The second clear reason for commuting to rural areas was displayed in the qualitative results of this research. There exist some local units, classified as rural ones, where some specific activities were located, as for example a military unit in Powiśle. It is estimated that its liquidation can result in increase of unemployed by 70% in the municipality (Sirko S., 2012). However, also this situation should be treated as exception, which rather confirms conclusions drawn from cross-analysis between a number/density of commuters and the type of a local unit - rural areas generally do not attract commuters to such extent as cities and intermediate areas. A larger number of available work places in urban municipalities, so as a result a more significant potential to attract commuters, was for example noticed in Latvia (Bulderberga Z., 2015). A similar problem of lack of working places in rural areas was detected in

the Czech Republic (Domeova L., Jindrova A., 2014).

Conclusions

Rural areas in Poland have recently faced significant changes. The primary sector has been decreasing its contribution to local employment. In such a situation, it is interesting to examine if rural areas have potential to attract commuters as workplaces' creation can be treated as an important development factor of particular territory. Data on commuting to local territorial units and types of local units were cross-analysed in order to investigate it. The statistical analysis as well as visualization on maps proved that local units characterized as urban areas tend to attract the highest number of commuters. Rural areas attract relatively less commuters – the number of rural local units decreases as one considers a higher number of commuters. The same direction of the interpretation of the relationship occurred in the analyses of the absolute values of incoming commuters as well as in the case of their density per 1 km². However, it does not mean that rural or intermediate areas in Poland are not interested for commuters at all. There are some units, which thanks to their localization, relatively close to a city, or some special activities running there, attract a significant number of commuters.

Bibliography

1. Aguilera, A., Wenglenski, S., Proulhac, L. (2009). Employment Suburbanisation, Reverse Commuting and Travel Behaviour by Residents of the Central City in the Paris Metropolitan Area. *Transportation Research Part A*, Volume 43 (2009), pp. 685–691.
25. Bulderberga, Z. (2015). *Rural and Urban Municipalities in the Regions of Latvia – Development Tendencies and Challenges*. *Economic Science for Rural Development. Integrated and Sustainable Regional Development*, No 38, Jelgava, p. 158.
26. Central Statistical Office of Poland, Statistical Office in Olsztyn, (2013). *Rural Areas in Poland - National Agricultural Census 2010*, Warsaw, Olsztyn, p. 141.
27. Dijkstra, L., Poelman, H. (2014). *A Harmonised Definition of Cities and Rural Areas: the New Degree of Urbanisation*. Regional Working Paper, WP 01/2014, European Commission, p. 14.
28. Domeova, L., Jindrova, A. (2014). *Quality of Life in the Rural Territories. Agrarian Perspectives XXIII*. The Community-Led Rural Development Proceedings of the 23th International Scientific Conference, Prague, Czech University of Life Sciences Prague, p. 47.
29. Drejerska, N. (2010). *Education as a Determinant of the Economic Activity of Rural Inhabitants on the Polish Labour Market*. *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, Volume 56, pp. 68–75.
30. Drejerska, N. (2014). *Obszary przewazajaco wiejskie w Polsce - perspektywa rynku pracy (Predominantly Rural Areas in Poland – Labour Market Perspective)*. [in:] *Rolnictwo, gospodarka zywnosciowa, obszary wiejskie - 10 lat w Unii Europejskiej (Agriculture, Food Industry, Rural Areas – 10 Years in the European Union)*. Warsaw, Warsaw University of Life Sciences, pp. 57–58.

31. Eurostat, (2015). *Correspondence table - Degree of Urbanisation (DEGURBA) - Local Administrative Units*. Retrieved: http://ec.europa.eu/eurostat/ramon/miscellaneous/index.cfm?TargetUrl=DSP_DEGURBA. Access: 10.12.2015.
32. Field, A. (2009). *Discovering Statistics Using SPSS*. Third Edition, Sage Publications Ltd, p. 698.
33. Garcia-Palomares, J. C. (2010). Urban Sprawl and Travel to Work: the Case of the Metropolitan Area of Madrid. *Journal of Transport Geography* 18 (2010) pp. 197-213.
34. Gorecka, A. (2015). *Problems With Organising Agglomeration Passenger Transport Network – The Case of Warsaw Agglomeration*. *Logistics and Transport* No 3(27)/2015 pp. 11-16.
35. Naldi, L., Nilsson, P., Westlund, H., Wixe, S. (2015). What is Smart Rural Development? *Journal of Rural Studies* 40 (2015), p. 99.
36. Rakowska, J. (2014). Codzienne dojazdy do pracy jako ekonomiczne kryterium rządowych klasyfikacji i delimitacji obszarów (na przykładzie USA i Kanady) (Commuting as an Economic Criterion of Categorization and Delimitation of Areas (Examples of US and Canadian Governmental Classifications)). *Studia Regionalne i Lokalne* no 3(57)2014, p. 49.
37. Sheskin, D. J. (2011). *Handbook of Parametric and Nonparametric Statistical Procedures*. Fifth Edition, Chapman and Hall/CRC, p. 535.
38. Sirko, S. (2012). *Spoleczne i ekonomiczne konsekwencje likwidacji jednostki wojskowej na przykladzie wybranych gmin (Socio-economic Consequences of Military Unit Liquidation on the Example of Selected Municipalities)*. *Nierownosci Spoleczne a Wzrost Gospodarczy*, Volume 29, Uniwersytet Rzeszowski, p. 309.
39. Ward, N., Brown, D.L. (2009). Placing the Rural in Regional Development. *Regional Studies*, Volume 43.10, p. 1238.
40. Wojewodzka-Wiewiorska A. (2014). *Dynamika rozwoju spoleczno-ekonomicznego gmin wiejskich wojewodztwa mazowieckiego na tle innych typow gmin (Dynamics of the Socio-Economic Development of Rural Communes Relating to Other Types of Communes in the Masovian Voivodeship)* *Journal of Agribusiness and Rural Development* 2014, no 2, pp. 213-223.

DEVELOPMENT OF ENTREPRENEURSHIP IN RURAL AREAS OF NORTH-EASTERN POLAND

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Abstract. Rural areas are characterised by a considerable diversification of their natural, demographic, historical, spatial and socio-economic conditions. These conditions caused disproportions in the density of entities of national economy in the rural areas of North-eastern Poland. The main aim of article is the presentation of both the growth of non-agricultural activity in the rural areas of the Warminsko-Mazurskie and Podlaskie Voivodships in 2014 and the dynamics of changes in relation to 2004. Upon the analyses it was concluded that the density level of entities of national economy and the dynamics of change in entities of national economy featured by large disproportions across rural communes. The biggest changes characterised mainly the rural communes lying near the largest towns in the region: Olsztyn, Elblag and Bialystok. The highest dynamics of increase among the rural communes of North-eastern Poland were mainly recorded in the Warminsko-Mazurskie voivodship; whereas the most noteworthy decrease in the number of entities of national economy was in the rural communes situated along the Eastern border of the Podlaskie voivodship, which is the reflection of their poor economic activity. For a more profound analysis of the spatial distribution of the growth of entrepreneurship, the study results were juxtaposed to the existing demographic potential of the rural areas in North-eastern Poland. The results of the study revealed the following tendency: the higher the demographic potential of rural communes was, the more favourable indicators of growth of entrepreneurship appeared. It proves that demographic potential of workforce has a considerable impact on the development of the rural areas of North-eastern Poland.

Key words: entrepreneurship, rural areas, North-eastern Poland.

JEL code: R11, R12, J10

Introduction

The area of North-eastern Poland comprises the Warminsko-Mazurskie and Podlaskie voivodships and covers 44,360 km² and is inhabited by 2,635,885 people. The investigated area borders Kaliningrad Oblast, Lithuania and Belarus, and it marks the easternmost boundary of the European Union. North-Eastern Poland is characterized by a high degree of naturalness, diverse relief, an abundance of lakes, extensive forests and rich flora and fauna (Bera. M, 2013; Goraj .S, Nowak. M, Gwiazdzinska-Goraj. M, 2014). Unfortunately, the Warminsko-Mazurskie and Podlaskie voivodships also feature a low level of the Human Development Index and a poor growth dynamics. In 2013, this region's share in the Gross National Product (GNP) – the composite index illustrating an economic development of a particular region – amounted to as little as nearly 5.0 %. To a large extent, the rural areas of North-eastern Poland comprise agricultural land and are characterised by a high

ratio of agricultural production and food production. However, the major development trend which is gaining in significance there is tourism. The rural areas which, not such a long time ago – in the 1980s, were mono-functional are now more and more conspicuously becoming multi-functional, with the agricultural function being accompanied by the growth in non-agricultural activities (Goraj. S, Nowak. M, Gwiazdzinska-Goraj. M, 2014). Sustainable development of rural areas calls for reconciliation of three dimensions of development, which take into account the main objectives of rural area development: economic, social and environmental development (Dudzinska. M, Kocur-Bera. K, 2015). One of the most important solutions ensuring a sustainable development of rural areas is the promotion and stimulation of rural entrepreneurship. It has been common knowledge that enterprises are the key to and a driving force for both an economic growth and diversification in Europe (Skubiak. B, 2015).

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The aim of this paper is to analyse the development of entrepreneurship in the rural areas of North-eastern Poland in 2014. The analysis is based on the following indicators: the number of entities of national economy and the number of entities of national economy per 10 thousand inhabitants at working age. In this study, the measure of change dynamics in the number of entities of national economy was expressed by the values for the initial year of the study (2004) represented 100 %, and the values for the final year (2014) were benchmarked relative to 100 %. Simultaneously, for a more comprehensive examination of the spatial differences in the growth of entrepreneurship across rural communes, it deals with the impact of the existing demographic potential, too. The demographic potential was calculated for each rural community on the basis of the following indicators:

- dynamics of changes in population for period 2004-2014 (where 2004 = 100);
- birth rate per 1,000 inhabitants, 2014;
- balance of migration per 1,000 inhabitants, 2014;
- percentage of people at retirement age in the total population, 2014.

Due to the diversified demographic potential, a classification was created according to Perkal's method – one which enables comparison of particular indicators and formulation of a synthetic index. Depending on the result, a commune was qualified to Class I – the most favourable demographic potential, on one end of the scale, or to Class V – the least favourable demographic potential, on the other end of the scale. For a more profound analysis the selected indicators were analyzed to determine the spatial distribution of the rural areas of North-eastern Poland.

The main source of information for this analysis was the data supplied by the Central

Statistical Office in Poland (the Regional Data Bank).

Development of entrepreneurship in rural areas of North-eastern Poland

The year 2014 saw 61,072 entities of national economy in the rural areas of North-eastern Poland, as listed by REGON (National Business Registry), which accounted for approx. 5.5 % of all entities of national economy registered in Poland. When compared to 2004, the number of entities of national economy in the rural areas of North-eastern Poland increased by 29.0 %. The density of entities of national economy can be better depicted by the number of entities of national economy per 10 thousand inhabitants at working age. In 2004, this index equalled 771.1 for the rural areas of North-eastern Poland, while in 2014 it rose to 910.1. However, it should be noted that it was lower than the national average in the same period (Table 1). At the same time, the percentage of entities of national economy in the region under analysis in their total number in Poland in 2004 was only 5.7 % and was decreasing, which may indicate low dynamics of change (in comparison to other regions).

As far as the division of entities of national economy into the public and private sectors is concerned, the rural areas of North-eastern Poland were dominated by the private sector, which comprised 95.5 % of all business entities in 2004 and 96.4 % in 2014. The most common legal form of business activity in the rural areas in the whole Poland and in North-eastern Poland alike was business conducted by a natural person. This is the type of business activity which clearly reflects the economic activity of population – the so-called entrepreneurship. Indeed, in 2014 the share of natural persons' businesses in the total number of businesses registered in rural areas was 80.4 % in Poland and 78.2 % in North-eastern Poland.

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Table 1

Entities of the national economy in rural areas in Poland

Years	The number of national economy	The number of entities of national economy per 10 thousand inhabitants at working age	The number of national economy	The number of entities of national economy per 10 thousand inhabitants at working age	The percentage of entities of national economy in the region under analysis in their total number in Poland
	rural areas in Poland		rural areas of north-eastern Poland		
2004	829270	939.3	47510	771.1	5.7
2005	843138	894.2	48238	731.3	5.7
2006	864703	954.8	49329	784.2	5.7
2007	892469	974.0	50365	793.1	5.6
2008	928480	1002.3	52756	822.3	5.7
2009	935073	999.2	51807	803.9	5.5
2010	997020	1045.4	54320	816.2	5.4
2011	1004048	1047.7	54701	820.4	5.4
2012	1041897	1082.2	57125	853.0	5.5
2013	1081428	1119.6	59439	885.3	5.5
2014	1107515	1146.3	61072	910.1	5.5

Source: authors' calculations based on the official website of the Central Statistical Office www.stat.gov.pl (retrieved on 6 December 2015)

With regard to the size of enterprises, the rural areas of North-eastern Poland were dominated by entities of national economy employing up to nine workers, both in 2004 and 2014, which meant 94.7 % and 95.9 %, respectively. Small enterprises play an important role in the growth of entrepreneurship and, owing to their flexibility, they are more willing to embrace new knowledge and technology. Medium enterprises, hiring between ten to forty-nine employees, accounted for 4.7 % of all business entities in the rural areas of North-eastern Poland in 2004 and for 3.6 % in 2014. The smallest share in the total number of business entities was taken by enterprises with the workforce of fifty or more: 0.6 % in 2004 and 0.5 % in 2014. Entities of national economy, in terms of the type of business activity conducted, may be qualified to the following three main sectors: I - agriculture, forestry, hunting and fishing; II - industry and building; III - services. In 2014, both nation-wide and with regard to the rural areas of North-

eastern Poland, Sector III was the most numerous of all (66.7 % and 64.5 %, respectively), whereas Sector I was the least numerous (4.9% and 9.4%, respectively). Yet, in relation to the total number of business entities, the businesses active in agriculture, forestry, hunting and fishing took a larger share in rural areas of North-eastern Poland than in Poland as a whole, which was due to the characteristics of that region. The number of entities of national economy categorised into Sector II was at the level of 28.3 % in rural areas in Poland and 26.1 % in the rural areas of North-eastern Poland.

Development of entrepreneurship in rural areas of North-eastern Poland - spatial diversification

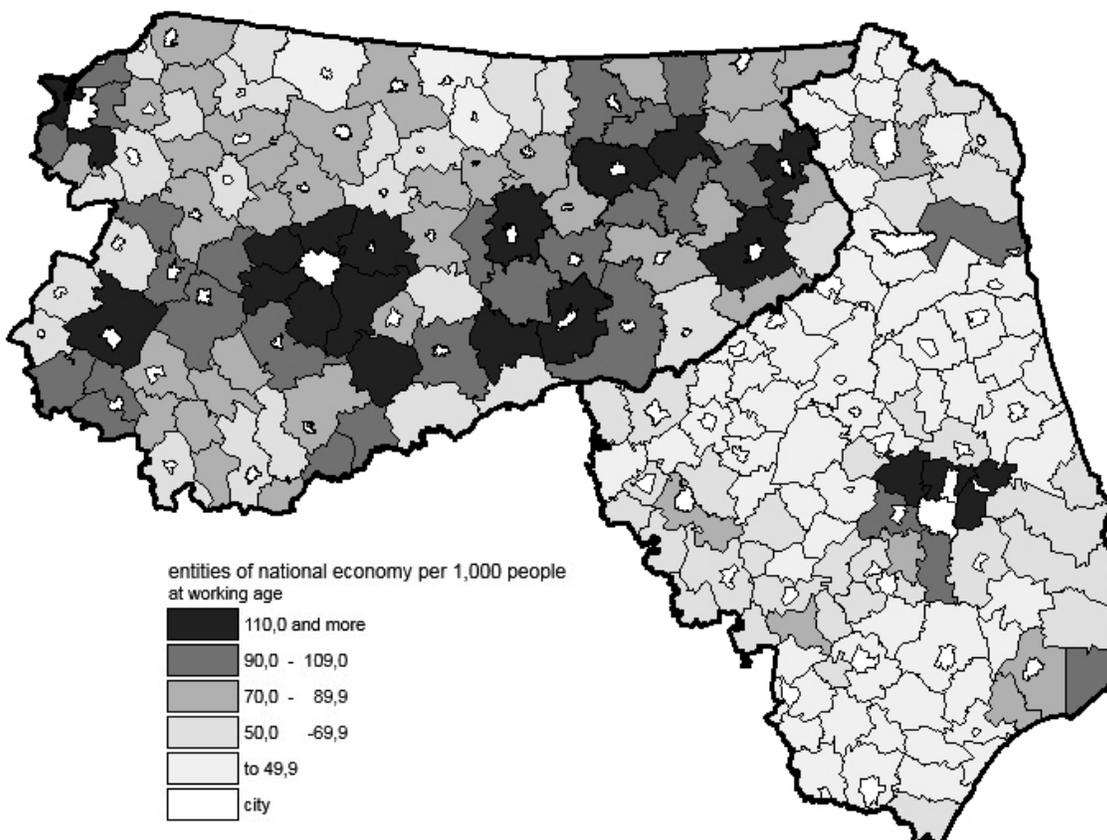
With the possibility of workplace provision to the unemployed or to people withdrawing from agricultural activity, on the one hand, and with an opportunity for family-owned agricultural holdings to gain supplementary incomes, on the

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other hand, the growth of entrepreneurship in the rural areas of North-eastern Poland has become the most desirable method of rural area activation. In the analysis of the density of entities of national economy registered in the rural areas of North-eastern Poland, it can be clearly seen regional differentiation (Figure 1). The ratio of entities of national economy per 1,000 people at working age equalled 91.0 for the rural areas of North-eastern Poland in 2014. The ratio oscillated between 40.0 in the commune of Jedwabne (the Podlaskie voivodship) and 207.1 in the commune of Stawiguda (Warminsko-Mazurskie voivodship). The highest intensity of non-agricultural activity was recorded in the rural communes situated in the vicinity of the largest towns in the region: Białystok, Olsztyn and Elbląg (Goraj S.,

Gwiazdzinska-Goraj M., 2011). Their development led to creation of a range of entities of national economy which were auxiliaries or service-providers to bigger businesses and which were also of service to town inhabitants. Quite a high density of entities of national economy was also a feature of the communes located in the centre of the Warminsko-Mazurskie voivodship; whereas in the Podlaskie voivodship that mostly applied to its Northern parts (lake districts) and Southern parts (areas with advantageous conditions for tourism). Non-agricultural activities were by far the least developed in Northern and Eastern rural communes of Warminsko-Mazurskie voivodship and in the centre of Podlaskie voivodship - thus, in the areas mainly associated with agriculture.



Source: authors' calculations based on the official website of the Central Statistical Office www.stat.gov.pl (retrieved on 6 December 2015)

Fig.1. Entities of the national economy in rural areas of North-eastern Poland in 2014 year

The pace of change dynamics in the number of entities of national economy (according to

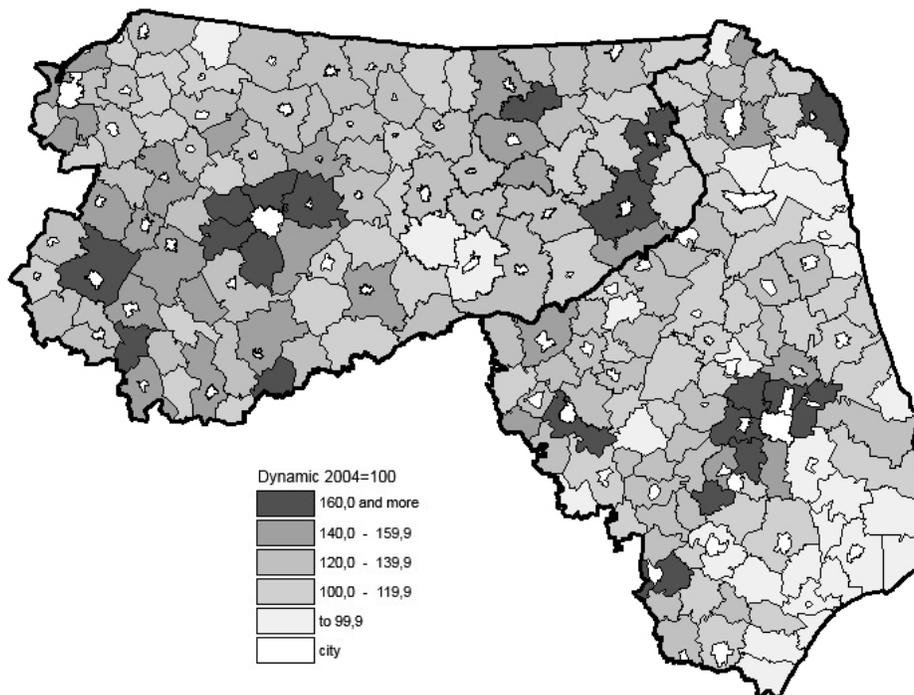
REGON) in the rural areas of North-eastern Poland in the period of 2004-2014 amounted to

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128 percentage points, whereby a bigger increase was noted in Warminsko-Mazurskie voivodship (113 percentage points) than in Podlaskie voivodship (108 percentage points). The indicator value changed in almost all rural communes in the area studied, which should be deemed a positive tendency. The highest change

dynamics among the rural communes was recorded in the rural commune of Stawiguda (Warminsko-Mazurskie voivodship) - 222 percentage points and the lowest change dynamics was in the rural commune of Dubicze Cerkiewne (Podlaskie voivodship) - 63 percentage points.



Source: authors' calculations based on the official website of the Central Statistical Office www.stat.gov.pl (retrieved on 6 December 2015)

Fig.2. The pace of change dynamics in the number of entities of national economy in the rural areas of North-eastern Poland in the period of 2004-2014

The biggest changes characterised mainly the rural communes lying near the largest towns in the region: Olsztyn, Elblag and Bialystok. At this juncture, it should be emphasised that the indicator was subject of a substantial rise in the rural communes of Warminsko-Mazurskie voivodship, which points to their higher economic activity (Figure 2). However, a clearly noticeable decline in the number of entities of national economy featured along the Eastern border of the Podlaskie voivodship (which is also the Eastern-most borderline of the European Union). Naturally, border areas are also peripheral areas – away from the centres of development in a given country. Nevertheless, the location on the national border does not need to be a barrier to

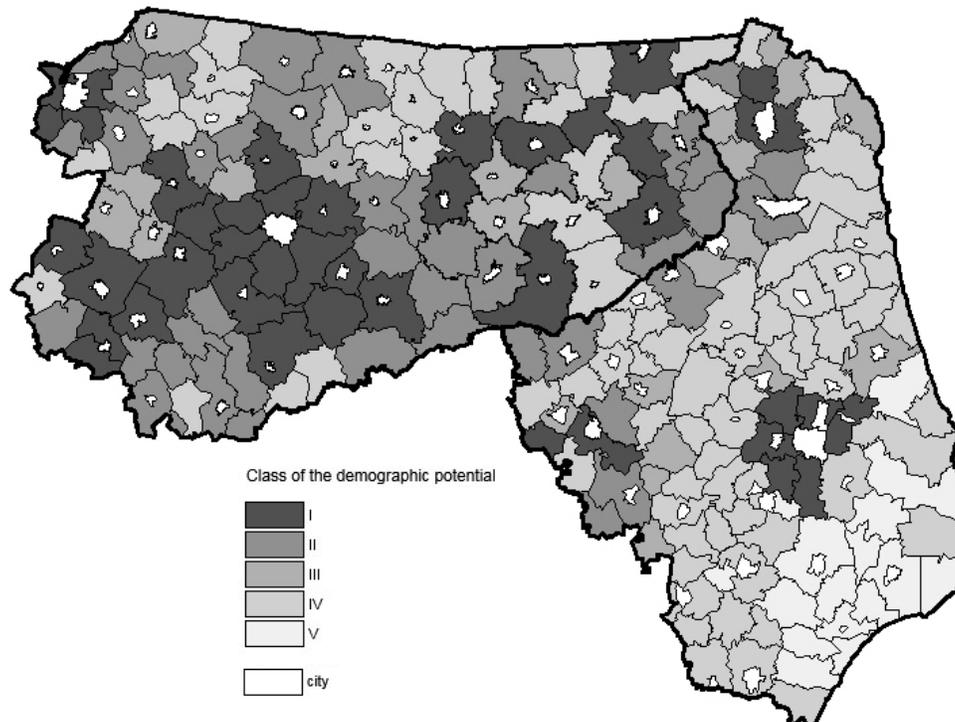
the socio-economic development - it should rather be a stimulant for growth but, still, it depends on how open the borders are (Banski J. et al., 2010). In the rural areas of North-eastern Poland, there was a regularity that the further from the Eastern national border a rural commune was, the higher an increase in the number of entities of national economy there was – the trend which may prove negative for the border communes. In fact, peripheral areas were characterised by a low growth rate and a poor demographic potential. What can act as evidence of advanced negative changes in demographic processes is an excessive outward migration of people and a low birth rate, which leads to an unfavourable age structure of rural population;

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and since the existing demographic potential affects the labour market, it also yields impact on the growth of entrepreneurship. However, a growth of non-agricultural activity – through creation of new workplaces and a consequential improvement of people's incomes – could undoubtedly contribute to deceleration of depopulation. For a more profound analysis of the spatial distribution of the growth of entrepreneurship, the study results were

juxtaposed to the existing demographic potential of the rural areas in North-eastern Poland. The demographic potential was calculated for each rural community on the basis of the four indicators and formulation of a synthetic index. Depending on the result, a commune was qualified to Class I – the most favourable demographic potential, on one end of the scale, or to Class V – the least favourable demographic potential, on the other end of the scale.



Source: authors' calculations based on the official website of the Central Statistical Office www.stat.gov.pl (retrieved on 6 December 2015)

Fig.3. The demographic potential in the rural areas of North-eastern Poland in the period of 2004-2014

Class I included rural communes with the highest demographic potential. These communes enjoyed: high birth rate; high balance of migration; small share of population at retirement age; and high dynamics of changes in population for period 2004-2014; whereas Class V comprised rural communes featuring: large share of population at retirement age; usually low birth rate; balance of migration at a

level below the average for their voivodship; and decrease in population between 2004 and 2014. The analysis of the spatial distribution of the existing demographic potential demonstrated substantial differences. The highest results were in the case of the rural communes situated in the neighbourhood of the largest towns in the region, and the lowest results were recorded in the South-eastern part of the region.

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Table 2

Classification of rural communities by the demographic potential of the North-eastern Poland and indicators of entrepreneurship development

Class	Value of the potential demographic	Rural areas of North-eastern Poland	Rural areas in The Warminsko-Mazurskie voivodship	Rural areas in The Podlaskie voivodship	The number of entities of national economy per 10 thousand inhabitants at working age (average value)	The pace of change dynamics in the number of entities of national economy (2004=100) (average value)
		the number of rural communities				
I	3.67 to 0.50	41	10	31	107	150
II	0.49 to 0.10	43	34	9	76	128
III	0.09 to -0.04	24	10	14	60	126
IV	-0.05 to -0.95	81	25	56	60	121
V	-0.96 to -2.86	16	0	16	52	92

Source: authors' calculations based on the official website of the Central Statistical Office www.stat.gov.pl (retrieved on 6 December 2015)

A would-be co-relation between a demographic potential of the rural communes in North-eastern Poland and the growth of entrepreneurship was examined for the needs of this study by calculating the mean values of the following indicators: number of business entities per 10 thousand inhabitants at working age; and the dynamics of change in the number of entities of national economy in the period of 2004-2014 in the rural communes qualified to Classes from I to V by their demographic potential. The results of the study revealed the following tendency: the higher the demographic potential of rural communes was, the more favourable indicators of growth of entrepreneurship appeared. It proves that demographic potential of workforce has a considerable impact on the development of the rural areas of North-eastern Poland.

Conclusions

Upon the analyses conducted it was concluded that the density of business entities in the rural areas of North-eastern Poland was at the level of 771.1 in 2004 and at 910.1 in 2014. The number of business entities rose by 29.0% between 2004 and 2014. However, both the number of business entities per 10 thousand

inhabitants at working age and the dynamics of increase in that number in the region were lower than the national average in the period studied. The density level of business entities and the dynamics of change in entities of national economy featured by large disproportions across rural communes. The biggest changes characterised mainly the rural communes lying near the largest towns in the region: Olsztyn, Elblag and Bialystok. The number of entities of national economy increased in the majority of the rural communes in the region under examination, which should be considered a positive process. The highest dynamics of increase among the rural communes of North-eastern Poland were mainly recorded in Warminsko-Mazurskie voivodship.

For a more profound analysis of the spatial distribution of the growth of entrepreneurship, the study results were juxtaposed to the existing demographic potential of the rural areas in North-eastern Poland. The results of the study revealed the following tendency: the higher the demographic potential of rural communes was, the more favourable indicators of growth of entrepreneurship appeared. The most noteworthy decrease in the number of entities of national

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economy was noted in the rural communes situated along the Eastern border of Podlaskie voivodship, which is the reflection of their poor economic activity. The distribution of the analysed indicators illustrating the growth of entrepreneurship depends on a great many factors: natural, socio-economic, demographic, historical, and institutional. However, an unambiguous definition of their impact on and significance for the growth of entrepreneurship is a challenging task. The most difficult situation is faced by the rural communes of North-eastern Poland which are on the eastern border of

Podlaskie voivodship, where the low demographic potential combined with the peripheral location was responsible for a poor growth of entrepreneurship. Moreover, a lack of stimulation to non-agricultural activity in the rural areas of this part of the region may result in further accumulation of negative demographic processes.

Therefore, promotion and growth of rural entrepreneurship are together one of the most important solutions leading to a sustainable development of rural areas of North-eastern Poland.

Bibliography

1. Banski J., Dobrowolski J., Flaga M., Janicki W., Wesolowska M., 2010, *Wplyw Granicy Panstwowej na Kierunki Rozwoju Spooleczno-Gospodarczego Wschodniej Czesci Wojewodztwa Lubelskiego (The Influence of the State Border on the Directions of Socio-Economic Development of the Eastern Part of Lublin Voivodeship)*, Studia Obszarow Wiejskich, 21, IGiPZ, PTG, Warszawa (in Polish)
2. Bera M. (2013). *Atrakcyjnosc Turystyczna Gmin Wiejskich o Cennych Walorach Przyrodniczych Wojewodztwa Warminsko-Mazurskiego i Podlaskiego (Tourist Attractiveness of Rural Communes of Natural Values in Warminsko-Mazurskie and Podlaskie Voivodeships)*. Journal of Agribusiness and Rural Development, Volume 2 (28), pp. 5-12. (in Polish)
3. Dudzinska M. , Kocur-Bera K. (2015). *The Identification of Homogeneous Groups (Subpopulations) in Studies of Rural Areas, Considering the Need of Rural Management Works*. SGEM2015 Conference Proceedings, Book2 Vol. 2, pp 1147-1154.
4. Goraj S., Gwiazdzinska-Goraj M., 2011, *Rozwoj Przedsiębiorczosci na Obszarach Wiejskich Wojewodztwa Warminsko-Mazurskiego (The Development of Entrepreneurship in Rural Areas of the Warmia and Mazury Voivodeship)*. Infrastruktura i Ekologia Terenow Wiejskich Number 2011/ 02, pp 171-181. (in Polish)
5. Goraj S., Nowak M., Gwiazdzinska-Goraj M. (2014). *Functional Changes in Rural Areas in North-Eastern Poland*. Research for Rural Development 2014, Volume 2, pp 140-146.
6. Skubiak B., (2015). *Czynniki i Bariery Rozwoju Przedsiębiorczosci na Obszarach Wiejskich (Determinants of and Barriers to Entrepreneurship Development in Rural Areas)*. Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania, NR 42, T. 2, pp 99-107. (in Polish)
7. www.stat.gov.pl

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AGRICULTURAL EDUCATION OF MANAGERS OF AGRICULTURAL HOLDINGS IN POLAND IN 2002-2010

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Abstract. The level of education completed by farm managers plays an important role in agricultural development. The main aim of this article was to describe the structure of and changes in the educational status of farm managers in Poland in 2002-2010. The analysed managers had completed the following levels of education: university degree in agriculture, secondary school of agriculture or agricultural college, vocational school of agriculture, or a training course in agriculture. The influence of environmental and non-environmental factors was taken into account in the analysis to maximize the reliability of the spatial distribution of data. It was concluded that in both 2002 and 2010, less than 50% of Polish farm managers had completed some form of formal training in agriculture. The progress in agricultural technology and production methods creates a demand for highly qualified farmers, thus, education plays an increasingly important role in the modern agricultural sector. An analysis of the educational status of farm managers in Poland in 2010 and the changes observed between 2002 and 2010 clearly point to regional differences. The educational status of farm managers varied significantly across Polish regions, and the observed spatial distribution patterns were determined mainly by historical events and agri-environmental conditions. The educational attainment of farm managers was also positively correlated with the absorption rate of the EU funds, which implies that farm managers with higher educational status are more successful in acquiring the EU funds for Polish agricultural businesses.

Keywords: agricultural education, education, Poland.

JEL code: I21, I25

Introduction

Agricultural performance is determined by numerous factors. Human capital, defined as the combination of skills, knowledge and professional experience, began to play an increasingly important role in the farming sector at the turn of the 20th and 21st centuries (Janc, 2004; Kaminska, 2014). Many rural communities are characterized by low educational status due to cultural, social, economic and organisational reasons. At present, educational achievement in rural areas continues to lag behind modern requirements (Frenkel, 2003). Educational attainment is one of the key elements in qualitative assessments of workforce in the farming sector, and it contributes to rural development. Agricultural censuses are the most comprehensive source of information about educational attainment in rural areas. Due to the availability of relevant data, this paper analyses the educational status of managers of Polish farms. According to the definition of the Central Statistical Office, a farm manager is an individual

who has been authorised by the farm owner/user to make decisions that are directly related to production processes and work supervision.

This study analyses changes in the educational status and the educational attainment of Polish farm managers. The analysed managers had completed the following levels of education: university degree in agriculture, secondary school of agriculture or agricultural college, vocational school of agriculture, or a training course in agriculture. The aim of this study was to examine the spatial distribution of and changes in the educational status of farm managers in Poland in 2002 and 2010. The period analysed in the study was chosen due to the availability of data collected in agricultural censuses conducted in Poland in 2002 and 2010. The influence of selected environmental and non-environmental factors was taken into account in the analysis to describe educational attainment in agriculture in Polish counties-powiaty (without a division into rural and municipal counties to match the

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organisational structure of Local Offices of the Agency of Restructuring and Modernisation of Agriculture) (Rudnicki, 1997; Rudnicki, Kluba, 2014). The criteria for selecting factors that influence the educational status of farm managers are often interconnected and difficult to define. The suitability of land for agricultural production was evaluated based on the values of the agri-environmental soil quality index (Witek, Gorski, 1977). Based on the eligibility requirements of the "Support for agricultural production in less-favoured areas (LFAs)" Rural Development Programme, the analysed areas were classified into the following groups: (N) - land with unfavourable conditions for agricultural production (below 52 points in the agri-environmental soil quality index, lowland), (S) - land with average conditions for agricultural production (52-72 points, lowland), and (K) - land with favourable conditions for agricultural production (more than 72 points, excluding areas entitled to LFA payments). Historical events were among the non-environmental factors examined in the study. The history and diversity of agricultural practices are very important determinants of agricultural performance and production structure (Rudnicki, Kluba, 2014). During the partitions of Poland, the country was annexed by three foreign empires: Prussia, Austria-Hungary and Russia. Over time, the territories occupied by the three invaders developed different agrarian structures, settlement patterns, demographic structures, education systems and technical infrastructure systems (Stanny, 2011, Rosner, 2012, Stanny, 2013). The average values of the analysed indicators were calculated to evaluate the influence of historical events on the educational status of farm managers in the areas that belonged to Poland in the interwar period (between World War I and World War II), including the areas that had been formerly partitioned by Austria (ZA/P), Prussia (ZP/P) and Russia (ZR/P), and the areas that had been

formerly occupied by Prussia and belonged to Germany in the interwar period (ZP/N); the areas that had been formerly partitioned by Prussia (including the areas that belonged to Poland and Germany in the interwar period), Russia and Austria. The educational status of farm managers and the changes observed in the analysed period were also evaluated based on the spatial criterion in areas with low urbanisation levels – rural counties (z), and in areas with high urbanisation levels – municipal counties (g).

The presence of correlations between the educational achievement of farm managers and the absorption of the EU funds for the modernisation of Polish agriculture in 2002-2010 was also determined in the study. The Polish agricultural sector underwent significant transformation during that period, mainly due to high absorption of the EU funds (Rudnicki 2013, 2014). The absorption of funds allocated as part of the Common Agricultural Policy (CAP), totalling PLN 90.5 billion in 2002-2010 (Rudnicki 2014; Rudnicki, Kluba, Wisniewski, 2014), was expressed per 1 ha of farmland and per 1 farm actively involved in agricultural production. The above values were normalised (Racine, Raymond, 1977) and expressed in the form of a compound indicator denoting: (1) low absorption of the CAP funds (below 0.50 δ), (2) moderate absorption of the CAP funds (+/- 0.50 δ), and (3) high absorption of the CAP funds (above 0.50 δ). The dynamics of changes in the analysed counties in Poland was presented graphically in a cartogram. Educational status was represented with the use of two cartograms, where the first cartogram contained data for 2010 and the second cartogram presented differences in data between 2002 and 2010 (2002 data = 100 points). Results below 100 percentage points (pp.) indicated that the value of a given factor decreased in 2010 relative to 2002. Results equal to 100 pp. suggested an absence of changes, whereas results above 100 pp. pointed to an

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increase in the value of the evaluated indicator over the years.

A score-based assessment of the educational status of farm managers was performed and a synthetic indicator was calculated to comprehensively analyse the correlation between the level of agricultural education attained by farm managers and the structure of education. An additional category, "lack of agricultural education" (x1), was introduced to present the data relative to the total number of farms included in the study, and the following weights were assigned to the levels of agricultural education: training course in agriculture (x2), vocational school of agriculture (x3), secondary school of agriculture or agricultural college (x4), and university degree in agriculture (x5). It was assumed that a higher value of the above indicator was correlated with a higher level of agricultural education among farm managers in the analysed counties (Gwiazdzinska-Goraj, Rudnicki, 2015).

The main aim of this study was to determine changes in the educational status of farm managers involved in agricultural activity in Poland in 2002-2010, including the effects of environmental and non-environmental factors on the noted trends.

Research results and discussion

The educational status of farm managers significantly influences agricultural production. Educational status is a reliable predictor of managers' propensity to pursue professional and personal development. Managers with higher education are more likely to recognise the significance of modern technological and organisational standards in agricultural production in a rapidly globalizing world (Rudnicki, Kluba, Wisniewski, 2014). This study analysed the educational status of Polish farm managers, including its structure and the changes observed between 2002 and 2010. In 2010, there were 2,277,600 registered farms in Poland, where 83 % were actively involved in

agricultural production on average. The percentage of active farms ranged from 38 % in Skarzynsko-Kamienna county (Swietokrzyskie province) to 98.8% in Kazimierza Wielka county (Swietokrzyskie province). The spatial distribution of active farms varied significantly across the evaluated regions. The highest values were noted in counties situated in the provinces of Lublin (90.6 %), Mazowsze-Masovia (89.7 %) and Wielkopolska-Greater Poland (89.5 %). The lowest values were observed in counties situated in the provinces of Slask-Silesia (63.5 %) and Lubusz (71.9 %).

In 2010, 41.0 % of managers of active farms had some form of agricultural education or training, marking a 1.3 % decrease from 2002 (Table 1). In both 2002 and 2010, the majority of Polish farm managers had completed a training course in agriculture. In comparison with other types of agricultural education, a training course seems to be the most accessible type of training which is relatively short, inexpensive and available to all age groups. However, the results of the present study indicate that Polish farm managers are characterised by relatively low educational status.

In the analysed period, the percentage of managers who had completed a training course in agriculture decreased by 24 pp. in favour of other types of education. On a more positive note, the number of farms managed by university graduates increased by approximately 50 % between 2002 and 2010. Despite the above, individuals with a university degree in agriculture account for merely 2 % of Polish farm managers. In the analysed period, the percentage of farm managers who had graduated from an agricultural college or a secondary school of agriculture increased by 152 pp. However, managers in this educational status category accounted for only 8.6 % of the studied population in 2010. The percentage of farm managers who graduated from a vocational

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school of agriculture remained relatively stable in the analysed period.

An analysis of the educational status of farm managers in Poland in 2010 and the changes

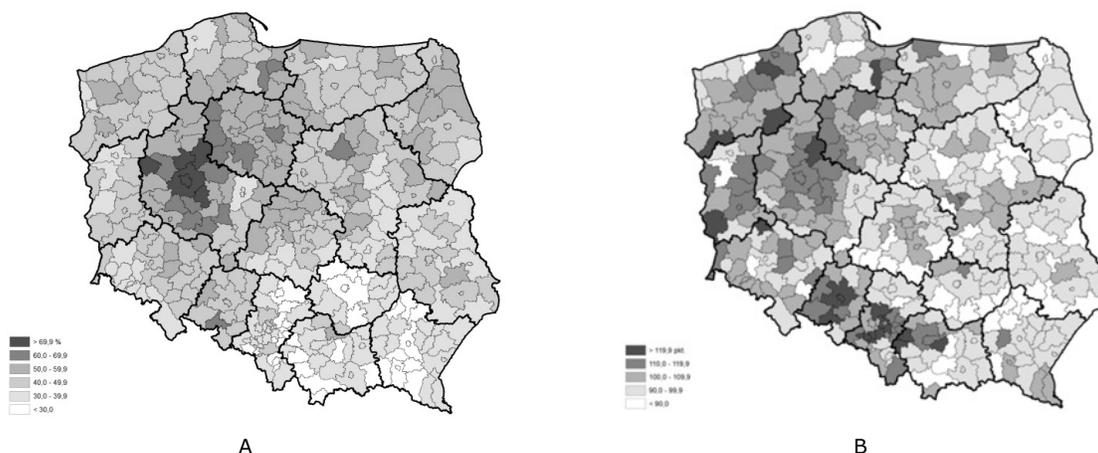
observed between 2002 and 2010 clearly point to regional differences (Figure 1).

Table 1

The level and structure of education among managers (members) of agricultural farms involved in agricultural activity in Poland in 2002 and 2010

Years	Agricultural farms involved in agricultural activity		Managers (members) of agricultural farms involved in agricultural activity in percentage					
	in thousands of Agricultural farms	percent age share of the total number of agricultural farms	agri-cultural education	Including				lack of agricultural education
				uni-versity degree in agriculture	second-ary school of agri-culture or agri-cultural college	vocatio-nal school of agri-culture	training course in agri-culture	
2002	2177.6	74.2	42.3	1.0	5.6	9.8	25.8	57.7
2010	1891.1	83.0	41.0	2.0	8.6	10.8	19.7	59.0
Rate of changes	87	112	97	190	152	111	76	102

Source: authors' calculations based on data provided by the Central Statistical Office in Poland



Source: authors' elaboration based on data provided by the Central Statistical Office in Poland

Fig. 1. Managers of agricultural farms with a degree in agriculture received in 2010 (percentage share of the total number of agricultural holdings) - A and changes noted between 2002 and 2010 (2002=100 pp) - B

The influence of agri-environmental, historical and spatial factors was taken into account in the analysis of the spatial distribution of farms managed by persons with a different level of agricultural education. The progress in agricultural technology and production methods

creates a demand for highly qualified farmers; hence, education plays an increasingly important role in the modern agricultural sector. Therefore, another research objective was to determine whether agricultural education affects the level of absorption of the EU funds (Table 2).

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Table 2

Percentage share of farms managed by persons with a different level of agricultural education in the total number of farms involved in agricultural activity (2010) and the rate of changes noted under the analysed conditions

Specification	Managers (members) of agricultural farms involved in agricultural activity				
	agricultural education		lack of agricultural education		
	2010	Rate of changes 2002=100	2010	Rate of changes 2002=100	
Poland – total	41	97	59	102	
established conditions					
agri-environmental conditions	N	39.4	93	60.6	105
	S	41.8	97	58.2	102
	K	39.9	98	60.1	102
historical conditions	ZA/P	30.5	96	69,5	102
	ZP/P	54.2	107	45,8	92
	ZR/R	42.3	94	57.7	105
	ZP/N	44.8	103	55.2	97
spatial conditions - areas with low urbanisation levels and areas with high urbanisation levels	Z	41.2	97	58.8	102
	G	33.5	113	66.5	95
absorption of the EU funds	1	32.4	98	67.6	101
	2	41.6	95	58.4	104
	3	50.3	99	49.7	101

Source: authors' calculations based on data provided by the Central Statistical Office in Poland

In 2010, the percentage of farm managers with agricultural education ranged from 21.8 % in Skarzynsko-Kamienna county (Swietokrzyskie province) to 71.2 % in Oborniki county (Wielkopolska province), and the national average was 41.0 %. In 2010, the highest percentage of farm managers who had some form of agricultural education was noted in the provinces of Wielkopolska and Kujawy-Pomorze (Kujawy-Pomerania) which are characterised by average values of the agri-environmental soil quality index. Regional variations in the percentage of farm managers with agricultural education, relative to the total number of farm managers, can be traced back to historical events. The highest values of the above index were noted in counties which had been partitioned by Prussia. Those territories were the

first to introduce agrarian reforms, and they operated the largest and most successful farms. In comparison with the areas occupied by Russia and Austria, the first peasant organisations and the first schools for the farmers' children were also set up on the territories under the Prussian rule. The above explains the relatively high levels of educational attainment in rural communities, including among senior citizens, in the Wielkopolska province. In this region, education became an important part of peasant tradition, and it significantly contributed to the quality of human capital (Rosner, 2011, Stanny, 2013). The lowest percentage of farm managers with agricultural education was noted in regions with the least favourable agricultural conditions, including Podkarpacie (30.0 %), Slask (31.5 %), Malopolska (32.2 %) and Swietokrzyskie

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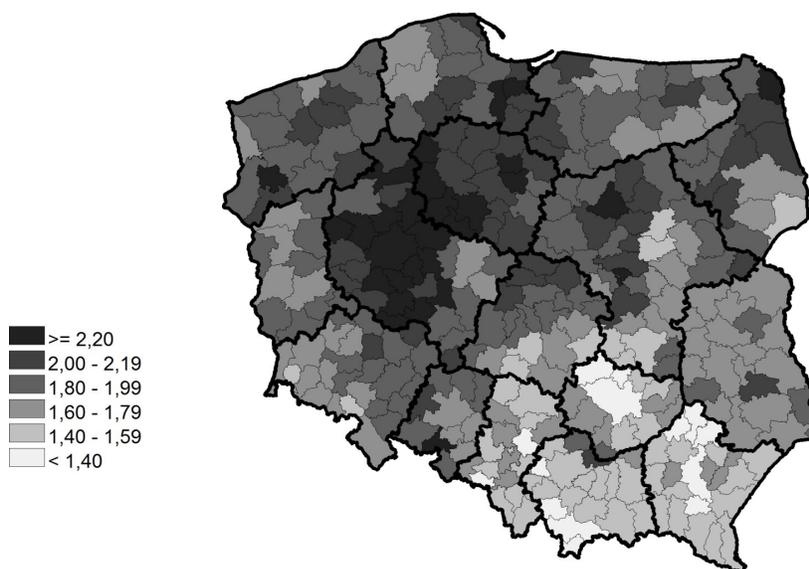
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(32.7 %). The percentage of farm managers who completed an educational programme in agriculture was also positively correlated with the absorption rate of the EU funds. The following tendency was observed: the higher the level of agricultural education represented by managers (members) of agricultural holdings involved in agricultural activity, the higher the absorption rate of the EU funds.

The rate of changes in the percentage of farm managers with agricultural education between 2002 and 2010 varied across the country, from 178 pp. in Hajnowka county (Podlasie province) to 161 pp. in Chrzanow county (Malopolska province). The percentage of

farm managers with agricultural education increased in approximately 70 % of the analysed counties. The highest increase was noted in North-eastern and Western Poland, territories historically controlled by Prussia which was renowned for its advanced agricultural policy. The lowest increase was recorded in the Eastern part of Poland, which is characterised by unfavourable agri-environmental conditions.

A score-based assessment of the educational status of farm managers was also performed and a synthetic indicator was calculated to comprehensively analyse the correlation between the level of agricultural education attained by farm managers and the structure of education.



Source: authors' elaboration based on data provided by the Central Statistical Office in Poland

Fig. 2. Synthetic indicator of score-based assessment of the educational status of farm managers in 2010

The synthetic indicator of score-based assessment of the educational status of farm managers in Poland reached 1.66 in 2002 and 1.75 in 2010. The spatial distribution indicator confirmed that natural conditions had a significant influence on the level of agricultural education among farm managers. In 2010, the indicator ranged from 1.28 in Skarzynsko-Kamienna county (Swietokrzyskie province) to 2.64 in Miedzychod county (Wielkopolska-Greater Poland province). The highest index values were obtained for counties with favourable natural conditions, located in the

provinces of Kujawy-Pomerania (2.13) and Wielkopolska-Greater Poland (2.09). The lowest values were observed in counties situated in the provinces of Podkarpacie (1.48) and Slask-Silesia (1.52). There was a positive relationship between favourable environmental and historical conditions for agricultural production and the level of agricultural education among farm managers.

Conclusions

The educational status of farm managers, including the level and structure of their

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education, is determined by both environmental and non-environmental factors.

In 2002 and 2010, less than 50 % of Polish farm managers had completed some form of formal training in agriculture. The progress in agricultural technology and production methods creates a demand for highly qualified farmers. As a result, education plays an increasingly important role in the modern agricultural sector. In both 2002 and 2010, the highest percentage of farm managers had completed a training course in agriculture, whereas university graduates accounted for the lowest percentage of agricultural managers.

The educational status of farm managers varied significantly across Polish regions, and the observed spatial distribution patterns were determined mainly by historical events and agri-environmental conditions. The percentage of farm managers with a degree in agriculture was higher in counties with more favourable conditions for agricultural production. The highest concentration of university-educated farm

managers was also observed in areas that had been annexed by Prussia, the historical occupant with advanced agricultural practices. The educational attainment of farm managers was also positively correlated with the absorption rate of the EU funds, which implies that farm managers with higher educational status are more successful in acquiring the EU funds for Polish agricultural businesses.

A score-based assessment of the educational status of farm managers revealed that there was a relationship between the level of agricultural education attained by managers of farms involved in agricultural activity and the structure of education.

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Bibliography

1. Frenkel, I. (2003). *Ludność Zatrudnienie i Bezrobocie na Wsi. (Population Employment and Unemployment in Rural Areas)*, Instytut Rozwoju Wsi i Rolnictwa, Polskiej Akademii Nauk, Warszawa, Poland, pp. 215.
2. Gwiazdzinska-Goraj, M., Rudnicki, R. (2015). *Stan i Zmiany Wykształcenia Rolniczego Kierowników Gospodarstw Rolnych w Latach 2002-2010 w Województwie Kujawsko-Pomorskim. (Quantitative Approach to and Trends in Agriculture-related Education among Managers of Agricultural Holdings between 2002 and 2010 in Kujawsko-Pomorskie Voivodship)*. *Studia Obszarów Wiejskich*, t. XXXX, pp. 35-47.
3. Janc, K. (2004). *Znaczenie Kapitału Ludzkiego w Procesach Globalizacji. (The Importance of Human Capital in the Processes of Globalization)* [w:] Człowiek, Region, Państwo w Procesach Globalizacji, Regionalizacji oraz Integracji. (Man, Region, State in the Processes of Globalization, Regionalization and Integration). G. Rdzanek, E. Stadtmüller (red.), Uniwersytet Wrocławski, Wrocław, Poland, pp. 71-82.
4. Kaminska, W. (2014). *Przemiany Struktury i Poziomu Wykształcenia Ludności Wiejskiej w Polsce w Latach 2002-2011. (Transformation of the Structure by Education Level of Rural Population in Poland in 2002-2011 Years)*. [w:] Polityce Spójności UE a Rozwój Obszarów Wiejskich. Stare Problemy i Nowe Wyzwania. (UE Cohesion Policy vs. Rural Development Old Problems and New Challenges) W. Kaminskiej i K. Heffnera (red.), *Studia tom CLVI, Polska Akademia Nauk Komitet Zagospodarowania Przestrzennego Kraju*, Warszawa, pp.133-169.
5. *Pracujący w Gospodarstwach Rolnych. (Employment on Agricultural Farms)*. (2012). Powszechny Spis Rolny 2010, GUS, Warszawa, pp. 188.
6. Racine, J.B. Reymond, H. (1977). *Analiza Ilościowa w Geografii. (Quantitative Analysis in Geography)*. PWN, Warszawa, pp. 254.
7. Rosner, A. (2011). *Zróżnicowanie Przestrzenne Obszarów Wiejskich a Pożądane Kierunki ich Rozwoju. (Territorial Differences Among Rural Areas and the Desirable Directions of Rural Development)* [in:] Obszary Wiejskie: Wielofunkcyjność, Migracje, Nowe Wizje Rozwoju. (Rural Areas: Multifunctionality, Migration and New Visions of Development) W. Kaminska i K. Heffner (red.) KPZK PAN, *Studia t. CXXXIII*, Warszawa, pp. 27 - 42.
8. Rosner, A. (2012). *Zmiany Rozkładu Przestrzennego Zaludnienia Obszarów Wiejskich. Wiejskie Obszary Zmniejszające Zaludnienie i Koncentrujące Ludność Wiejską. (Variations in Spatial Distribution of Population in Rural Areas. Rural Areas Experiencing Depopulation and Concentration of Rural Population)*. Instytut Rozwoju Wsi i Rolnictwa PAN, Warszawa, pp. 158.
9. Rudnicki, R. (1997). *Geograficzno-Ekonomiczne Czynniki Kształtujące Produkcję Rolnictwa Indywidualnego na Przykładzie Makroregionu Dolnej Wisły. (Geographic and Economic Factors Affecting the Production of Individual Farming on the Example of the Macro-region of the Lower Vistula)* Uniwersytet Mikołaja Kopernika w Toruniu, Towarzystwo Naukowe w Toruniu, Torun, pp. 167.

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10. Rudnicki, R. (2013). *Spatial Differences in the Number of Applications for Payments under the UE Common Agricultural Policy Submitted by Agricultural Holdings in Poland over the Years 2002-2010*, [in:] *Development of Rural Areas in European Regions*, A. Kolodziejczak (red.), *Quaestiones Geographice*, 32 (4), Poznan, pp. 15-31.
11. Rudnicki, R. (2014). *Analiza Absorpcji Srodkow WPR i Ich Wplywu na Zmiany Strukturalne w Rolnictwie Polskim. (Analysis of the Absorption of CAP Measures and Their Impact on Structural Change in Polish Agriculture)* [w:] *Zroznicowanie Przestrzenne Rolnictwa. (The Spatial Differentiation of Agriculture)*. B. Glebocki (red.), GUS, Warszawa, pp. 441-463.
12. Rudnicki, R., Kluba, M. (1993). *Przestrzenne Zroznicowanie oraz Zmiany Poziomu Wykształcenia Uzytkownikow Indywidualnych Gospodarstw Rolnych w Makroregionie Dolnej Wisly w Latach 1978-1988. (Spatial Diversity and Changes in the Level of Education of Individual Users Farms of the Region of the Lower Vistula in the Years 1978-1988)*. Acta Univ. Nic. Cop., Geografia XXV, Wyd. Uniwersytetu M. Kopernika, Torun, pp. 99-107.
13. Rudnicki, R., Kluba, M., Wisniewski, L. (2014). *Zroznicowanie Regionalne Rolnictwa a Poziom Absorpcji Funduszy Wspolnej Polityki Rolnej. (Regional Variation of Agriculture and Technical Funds Absorption of the Common Agricultural Policy)*. [w:] *Zintegrowany Rozwoj Obszarow Wiejskich w Swietle Polityki Unii Europejskiej. (Integrated Rural Development in the Light of European Union Policy)*. Rudnicki R., Kluba M. (red.), t. 1, *Rolnictwo i Wspolna Polityka Rolna*, Wyd. Naukowe UMK, Torun, pp. 9-36.
14. Stanny, M. (2011). *Typologia Wiejskich Obszarow Peryferyjnych pod Wzglemem Anatomii Struktury Spoleczno-Gospodarczej. (A Typology of Rural Peripheral Areas in Poland - Anatomy of the Socio-Economic Structure)*. *Wies i Rolnictwo* nr 2 (151), Warszawa, pp. 59-75.
15. Stanny, M. (2013). *Przestrzenne Zroznicowanie Rozwoju Obszarow Wiejskich w Polsce. (Spatial Diversification of Rural Area Development in Poland)*. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk, Warszawa, pp. 329.
16. *Waloryzacja Rolniczej Przestrzeni Produkcyjnej Polski. (Valorisation of Agricultural Production Area Polish)*. 2000. Biuletyn informacyjny IUNiG nr 12, Pulawy, pp. 4-17.
17. Witek, T., Gorski, T. (1977). *Przyrodnicza Bonitacja Rolniczej Przestrzeni Produkcyjnej w Polsce. (Nature Valorisation of the Agricultural Production in Poland)*. IUNG, Pulawy. pp. 21.

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INTRODUCING OF SMART WORK – OPPORTUNITY TO INCREASE ECONOMIC DEVELOPMENT OF MUNICIPALITIES IN LATVIA

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Abstract. The research focused on analysis of smart work, its advantages and disadvantages. The aim of the research is to verify hypothesis that introducing of smart work will promote economic development of municipalities in Latvia and that people in municipalities are ready to do smart work. Analysis of economic development of Balvi municipality (Latvia) shows that there are economic problems that can be solved by introducing of smart work in the municipality. Survey of Balvi population shows that people in this municipality are ready to work smart and to do distant work in Smart Work Centres (SWC). Smart Work Centre will increase development of Balvi municipality, it will provide new working places, decrease unemployment and will help maintain population in the municipality.

Key words: smart work, regional development, municipality.

JEL code: R 110

Introduction

Unequal regional development is one of the main problems in Latvia. Therefore, it is necessary to find solutions how to increase economic growth in each region. It is possible to find out advantages and disadvantages of every region. It is also possible to find out benefits from smart work and also disadvantages of smart work for three main society groups – employers, employees and government.

The aim of the research is to verify the hypothesis that introducing of smart work will promote economic development of municipalities in Latvia and that people in municipalities are ready to do smart work. The main tasks are to study the concept of smart work, to define its benefits and disadvantages, to evaluate economic development of Balvi municipality and to find out the opinion of Balvi municipality's population about possibility to work smart.

Research methods are analysis and synthesis, quantitative data analysis, comparison, graphical methods, survey.

Concept of smart work

The nature of economy has been changing during last centuries – from the agriculture age in 18th century to the information era nowadays. Nations and enterprises are increasingly aware of the importance of being ahead of the next so called 'wave' of innovation. If during the recent wave of innovation ICT was driven by market

needs such as reducing transaction costs, significant evidence exists to state that the next waves of innovation will be driven by the need to simultaneously improve productivity whilst decreasing negative environmental impact on the planet (The Natural Edge Projects, 2004).

The development of ICT gives advantages for private and public sector. Electronic flows of documents in the public administration can increase efficiency and transparency. Business climate is affected positively by e-development. It improves general quality of services across industries and sectors of the economy and creates opportunities for cross-country and cross-sectorial development (Carayannis E. G., Von Zedtwitz M., 2005). Development of ICT and reaching of 5th and also future 6th wave of innovations is the basis for smart work development. For example, development of ICT has encouraged the development of companies that offer such services as customer catering using ICT, as well as gathering, storing, processing and selling of information in the North of Sweden (Nuur C., Laestadius S., 2009). Innovation is well at work when it reaches strong, on-going and diversified community support along with rigorous evaluations (Bernard M.-M., Fruhwirth M., De Mareul Willete C., 2015). But ICT will not automatically stimulate the regional or rural economy. The technologies should be integrated

in the rural economies according to the needs of local inhabitants and entrepreneurs.

The past six generations have resulted in the most rapid and profound change the mankind has experienced in the 5000 years of its recorded history (Gratton L., 2011). This has led also to the transition in the way of working. An increasing share of businesses and other organizations are keen to use smart work (telework, distant work, e-work, mobile work, remote work) - a wide-spread practice that allows employees and their tasks to be shared across settings away from central place of business or physical organizational location (Robertson M., Vink P., 2012). Organizations have increasingly implemented smart work arrangements for various reasons. Smart work may not only reduce costs for office space and travel in large countries with long distances and in cities with crowded traffic, it may also help companies attract and retain a highly qualified workforce (Beham B., Baierl A., Poelmans S., 2014).

New ICT solutions, rapidly developing technologies as well as managerial changes can facilitate an increasing proportion of smart workers. Smart work is the way how enterprises and public authorities can become more progressive. They will allow their employees to join together work, private and social life – not only domestic life but also participation in nongovernmental or political organizations, cultural activities that allows people to express themselves as social beings (LBAS, 2010).

A research enterprise Capgemini defines smart work as *"an approach to organising work that aims to drive greater efficiency and effectiveness in achieving job outcomes through a combination of flexibility, autonomy and collaboration, in parallel with optimising tools and working environments for employees"* (Capgemini, 2008).

But there are various approaches for defining smart work. Some of them hold a view that

smart work is employment when only IT and network of data transmission is used (concept used in the USA). The others accept smart work as any job, even not concerned with the use of IT and data transmission, inter alia, all forms of self-employment (concept used in the EU). But in recent years International Labour Office begins to separate smart work and self-employment to apply different political instruments for smart workers and handicraftsmen (Telework Analytics International, 2013).

The latest concept of smart work is concerned with working anywhere, any time but it needs strong intrinsic motivation (Boorsma B., Mitchel S., 2011). Working in Smart Work Centres (SWC) is considerably new way of doing smart work or telework.

Benefits and disadvantages of smart work

If elaborated, implemented and managed effectively, smart work approaches and SWCs can be successful and can return numerous benefits. Successful companies have vision on work as an activity, not a place. Smart work gives the opportunity to work more efficiently and to offer a better service to the client and to foresee longer service/opening hours. Smart work can give the opportunity to redesign and simplify the work processes too. Main benefits from smart work for an employer are summarized in Table 1.

Smart work adoption in companies is rather often met with resistance. The main disadvantages are:

- it is difficult to control employees, process of work;
- agreements need to be made about the hours during which the distance worker needs to be accessible by telephone or by mail, and the e-work days must be carefully selected in order not to impede daily operations;
- safety of information and produced product. The e-worker remains responsible for the correct use and management of material and

the information put at his/her disposal by company.

Main benefits from smart work for an employee are summarized in Table 2.

Table 1

Main benefits from smart work for employers

Economic benefits	Social benefits
1) If employer's business is in an expensive area, distance working can save employer a lot of money. If employees live in areas with a low cost of living and good internet connectivity, they can afford to accept relatively low salaries 2) Rent cost reduction due to reduced office space requirements 3) Decrease in furniture costs due to reduced working places 4) Improved productivity 5) Less purchase costs of ICT 6) Public utilities payment reduction (employees may consume less energy at work for heating and lighting, sewerage) 7) Less staff training	1) Recruitment and retention of staff – it is possibility to attract good specialist, who otherwise will not work in this office (no possibility to pay so big wage / specialist is living far from the office / the office is located in rural area, where are not good specialists) 2) Adherence to company's regulations and increased organizational commitment 3) Reduced absenteeism 4) Better service (longer service / opening hours) and opportunity to offer more flexibility 5) Promoted diversity 6) Decrease of production time: short time between customer's order and product delivery 7) New channels of service distribution and an increase in market reach

Source: authors' construction

Table 2

Main benefits from smart work for employees

Economic benefits	Social benefits
1) Money saving on fuel and parking 2) Money saving on public transport tickets	1) Improved quality of life and work life 2) Better work/family balance 3) Increased job satisfaction 4) Increased autonomy 5) More flexibility 6) Quiet rooms or areas to allow for uninterrupted time 7) Holding meetings only when necessary 8) Ability to speak up about concerns without fear of retaliation 9) Reduced commute time 10) People with disabilities/health problems can work 11) Child care issues less stressful. Lower stress level 12) Mentoring opportunities 13) De-routinization of work 14) Possibility of living in rural areas while retaining challenging jobs in the knowledge economy traditionally linked to metropolitan areas

Source: authors' construction

Employees usually indicate time gain and efficiency as the most important advantages. These were mainly caused by less living-working traffic and better concentration at the distance work place. An improvement of work/life balance was indicated as well as an increase of independence and of working by planning. The disabled can cooperate in the labour process.

Transport can be a problem for this particular group. The possibility to work in an adapted home workplace can attract more people of this group of possible workers.

Compared to office-based employees, smart workers experienced higher job satisfaction, less work-life conflict and higher productivity. From

the perspective of the employee the main disadvantages are:

- less contact with the team- less communication with supervisors and colleagues;
- it is difficult to find balance between private life and work for some smart workers;
- ICT problems. It depends on individual skills and specific PC programs;
- reduced informal mentoring, informal training and development;

- career development and promotions;
- reduced informal communication;
- interruptions from home.

The smart work extends into a wide range of areas of political responsibility and public administration. Government policy plays an important role. Smart work may be a specific target for development strategies in the context of regional economic planning. Main benefits from smart work for local municipality are summarized in Table 3.

Table 3

Main benefits from smart work for local municipalities

Economic benefits	Social benefits
1) Growth of productivity 2) Multiplier effect increases 3) Increase of revenues in the local authority budget from income tax due to people staying, living and working in rural area	1) Activation of entrepreneurship 2) Better availability of job places, services and reduction of inside emigration 3) Reduction of transport intensity will incur (air pollution reduction; traffic congestion reduction; traffic accident reduction) 4) Local and regional development 5) Region becomes more attractive place for people staying and living there

Source: authors' construction

Smart work can help increase economic development of regions and local municipalities. Technology companies have been predicting that smart work — performing work from home or another remote location — soon will become the most common mode of work (Telework, 2011).

Economic development of Balvi municipality

Economic development of Balvi municipality in comparison with other municipalities of Latgale statistical region is evaluated using simplified formula (Formula 1) of Regional Competitiveness Index (RCI) and method of regional competitiveness evaluation worked out by authors (Judrupa I., 2011).

$$RCI = \frac{1}{N} \left(2 * \frac{f_1 - f_{\min_1}}{f_{\max_1} - f_{\min_1}} - 1 \right) + \dots + \left(2 * \frac{f_n - f_{\min_n}}{f_{\max_n} - f_{\min_n}} - 1 \right) \quad (1)$$

where:

RCI - regional competitiveness index;

$f_1 \dots f_n$ - real values of indicators;

$f_{\min} \dots f_{\max}$ - minimal and maximal values of indicators;

N – number of indicators.

The matrix of competitiveness level and growth rate was developed to define which factors are facilitating or impeding development (Figure 1).

<i>Competitiveness level</i>	1	+∞
	-∞	-1
	FACTORS POTENTIALLY IMPENDING DEVELOPMENT	FACTORS CURRENTLY FACILITATING DEVELOPMENT
	FACTORS CURRENTLY IMPENDING DEVELOPMENT	FACTORS POTENTIALLY FACILITATING DEVELOPMENT
		<i>Growth rate</i>

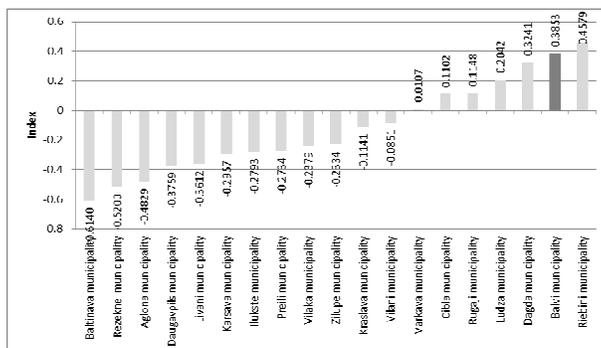
Source: Judrupa I., 2011

Fig. 1. Matrix of the factors affecting development in regions

Figure 1 shows that the factors currently facilitating development are the factors that have been with a positive growth and have ensured the region's indicator above the average development level. The factors currently impeding development are the factors that showed a negative growth and determined the region's ranking below the average development level. If the factor influencing development in regions is above the average compared to other regions but the trend of its development is

negative, the region can become less developed, if this trend remains the same in future. Such factors potentially impede development. If the indicator influencing development is comparatively low (below the average level) but with a tendency to improve, the factor can facilitate development if this tendency persists in future. Such factors can potentially facilitate development.

Figure 2 contains values of RCI for local municipalities of statistical region of Latgale.



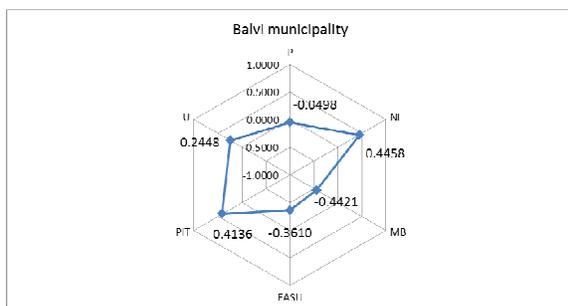
Source: authors' construction based on authors calculations

Fig. 2. Values of RCI for local municipalities of Latgale statistical region, 2014

Figure 2 shows that Balvi municipality took the 2nd place among other municipalities of Latgale statistical region. The value of RCI in 2014 was 0.3853. Balvi municipality is one of the economically developed municipalities of Latgale statistical region but in the scale of Latvia its competitiveness is considerably lower than competitiveness of municipalities of other statistical regions.

Figure 3 shows that the most competitive fields of Balvi municipality consist of rather high revenue from personal income tax, comparatively low level of unemployment and comparatively high natural increase of population (but in Balvi municipality this indicator is still negative). One of the important problems is negative migration balance – it means that people are tended to leave municipality.

The most and less developed spheres in Balvi municipality, which were evaluated using indicators of RCI, are shown in Figure 3.



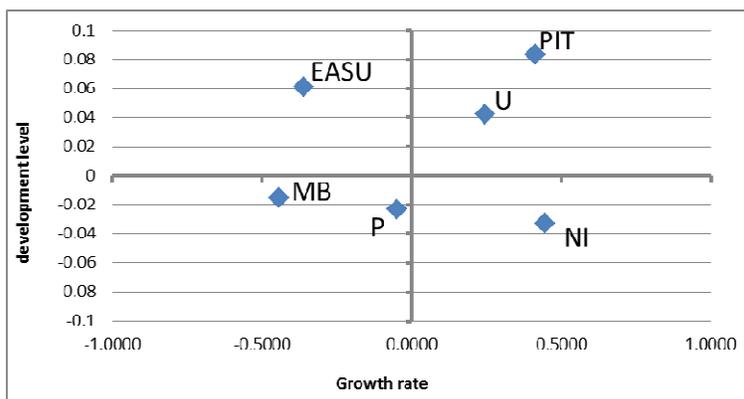
P – population;
NI - natural increase per 1000 inhabitants;
MB - migration balance per 1000 inhabitants;
EASU - economically active statistical units of market sector per 1000 inhabitants;
PIT - revenues per person from Personal Income Tax in municipalities' budgets, EUR;
U - level of unemployment, %.

Source: authors' construction based on authors' calculations

Fig. 3. The most and less developed fields of Balvi municipality, 2014

Using matrix of development influencing factors for Balvi municipality helps pointing out

main factors that facilitate or impede economic development of the municipality (Figure 4).



Source: authors' construction based on authors' calculations

Fig. 4. Matrix of the factors influencing development in Balvi municipality, 2014

Figure 4 shows that the factors currently facilitating development in Balvi municipality in 2014 were comprised of comparatively low level of unemployment and revenue from personal income tax in the budget of municipality. These indicators have values above the average and have positive trend. The factor potentially facilitating development is a natural increase of population, because the value of this indicator is below average but it was a tendency of improving. The factors currently decreasing development are negative migration balance below average, as well as small number of population, which continues to decrease. The factor potentially impeding development in future would be economically active statistical units of market sector, because the amount of enterprises is now above average but it has negative trend.

Development of SWC and introducing of smart work could help improving the situation in Balvi

municipality almost in all indicators. A survey was conducted to find out the opinion of population of Balvi municipality regarding smart work.

Main results of survey regarding smart work in Balvi municipality

The survey was conducted during the period of 27.06.2012 and 21.10.2012 with a participation of 169 respondents from Balvi municipality. The smart work is the way to improve social and economic situation for individuals and it is obviously proved by results of the survey. Eighty one per cent of inhabitants from Balvi municipality participating in the survey were interested in the smart work. Twenty six per cent thereof were aged between 18 and 30. Only 5% were not interested to distant work. So, the population expressed interest about this new way of working, especially young people.

It is possible to do smart work from different places – home, library, SWC and others. Is it

necessary to establish SWC in Balvi municipality to promote this way of working? This was also one of the questions of survey. Both types of smart work have their own advantages. Choosing a method of working requires for everybody to evaluate advantages and disadvantages of telework, personal touches and specific features of the work. Sixty one per cent of all surveyed inhabitants of Balvi municipality preferred working from home, while twenty six per cent of population was ready to work in SWC. The main reasons for choosing to work at SWC were:

- possibility to use Xerox, scanner, printer - 53 %;
- well-equipped working space (PC, Internet) - 46 %;
- possibility to get consultations about starting and developing of entrepreneurship - 37 %;
- chance to meet other people who do the same work - 34 %;
- possibility to search for job - 31 %.

Sixty one per cent of all population pointed out private benefits from smart work - possibility to spend more time with family and flexible working hours. Thirty seven per cent mentioned economic benefits as most important. Analysis of survey results shows that population in Balvi municipality is ready to do smart work, and a part of them is willing to work at SWC.

Conclusions, proposals, recommendations

1) ICT development is the base of smart work, and now it is the best time to introduce smart work because society has reached the 6th innovation wave.

2) ICT development, implementation of smart work approach and establishment of smart work centres can create new jobs for people with different qualification and skills in rural areas. The availability of new jobs and services increases people's willingness to stay and live in native country even if it is located in the rural area. Consequently, the region

enhances its economic and entrepreneurial competitiveness.

3) According to results of questionnaire, employees indicate time gain, efficiency and an improvement of work/life balance as the most important advantages. Enterprises are also interested in implementing smart work approach. They can save money by transferring production (service) from the city to the rural areas where rent and wages are lower. Companies usually want to maximize profit trying to be innovative and elastic. This is one way to maximize profit using modern personal management. Smart work adoption in companies is sometimes met with resistance mostly due to unawareness and distrust. Therefore, the initiative of municipality and cooperative strategy between entrepreneurs, employees and municipality is crucial for smart work implementation in the region. Smart work can help increasing economic development of the regions and local municipalities.

4) The factors currently impeding development in Balvi municipality are comprised of negative migration balance below average as well as small number of population which continues to decrease. Establishing of SWC and introducing of smart work could help improving the situation in Balvi municipality in almost all indicators:

- decrease unemployment level;
- increase incomes from personal income tax;
- improve migration balance;
- increase number of economical active statistical units of market sector;
- improve natural increase.

5) Survey of population in Balvi municipality regarding smart work and necessity of SWC shows that the population in Balvi municipality is ready to do smart work, while a part of them is willing to work at SWC. Smart Work

Centre will increase development of Balvi decrease unemployment and help maintaining
municipality, create new working places, population in the municipality.

Bibliography

1. Beham B., Baierl A., Poelmans S. (2014). *Managerial Telework Allowance Decisions – a Vignette Study Among German Managers*. The International Journal of Human Resource Management, Volume 26, Issue 11, pp. 1385-1406. Retrieved:
http://www.researchgate.net/publication/268077433_Managerial_telework_allowance_decisions_a_vignette_study_among_German_managers. Access: 08.01.2016
2. Bernard M.-M., Fruhwirth M., De Mareuil Willette C. (2015). *Virtual Village: Innovation at Work*. European research in Telemedicine, Volume 4, Issue 1, pp. 9-12. Retrieved:
<http://www.sciencedirect.com/science/article/pii/S2212764X14001137?np=y#>. Access: 29.12.2015
3. Boorsma B., Mitchel S. (2011). *Work Life Innovation. Smart Work – A Paradigm Shift Transforming How, Where, And When Work Gets Done*. Cisco IBSG 2011. Retrieved: http://www.cisco.com/web/about/ac79/docs/ps/Work-Life_Innovation_Smart_Work.pdf. Access: 29.12.2015
[http://www.google.lv/search?hl=lv&biw=853&bih=470&q=related:assets.panda.org/downloads/wwfteleworking.pdf+FROM+WORKPLACE+TO+ANYPLACE+ASSESSING+THE+OPPORTUNITIES+TO+REDUCE+GREENHOUSE+GAS+EMISSIONS+WITH+VIRTUAL+MEETINGS+AND+TELECOMMUTING+Authors:+ECOFYS+Marco+Buttazzoni+\(lead+author\)+Andrea+Rossi+WWF+Sweden+Dennis+Pamlin+CONNEXCORE+Suzanne+Pahlman&tbo=1&sa=X&ei=d3JoUaaIGsiQ4gTdm4HgDA&ved=0CCsQHZA](http://www.google.lv/search?hl=lv&biw=853&bih=470&q=related:assets.panda.org/downloads/wwfteleworking.pdf+FROM+WORKPLACE+TO+ANYPLACE+ASSESSING+THE+OPPORTUNITIES+TO+REDUCE+GREENHOUSE+GAS+EMISSIONS+WITH+VIRTUAL+MEETINGS+AND+TELECOMMUTING+Authors:+ECOFYS+Marco+Buttazzoni+(lead+author)+Andrea+Rossi+WWF+Sweden+Dennis+Pamlin+CONNEXCORE+Suzanne+Pahlman&tbo=1&sa=X&ei=d3JoUaaIGsiQ4gTdm4HgDA&ved=0CCsQHZA)
4. Capgemini. (2008). *Smart Working. The Impact of Work Organization and Job Design*. UK: London. Chartered Institute of Personnel and Development, p. 37 Retrieved: <http://www.cipd.co.uk/NR/rdonlyres/64A02358-8993-4185-BEEB-9812A9175383/0/smartworking.pdf>. Access: 29.12.2015
5. Carayannis E.C., Von Zedtwitz M. (2005). *Architecting GloCal (Global-Local), Real-Virtual Incubator Networks (G-RVINS) as Catalysts and Accelerators of Entrepreneurship in Transitioning and Developing Economies: Lessons Learned and Best Practices from Current Development and Business Incubation Practices*. Technovation, Volume 25, Issue 2, pp. 95-110.
6. Gratton L. (2011). *The Shift The Future of Work is Already Here*. Collins. p. 384.
7. Hargroves K., Smith M. (2005). *The Natural Advantage of Nations: Business Opportunities, Innovation and Governance in the 21st Century*. UK: The Natural Edge Project, Earthscan, London. p. 576.
8. Judrupa I. (2011). *Latvijas reģionu konkurētspējas novērtesana (Evaluation of Regional Competitiveness in Latvia)*. Promocijas darbs. Rīga, p. 172.
9. Lake A. (2011). *The Smart Working Handbook*. United Kingdom. Retrieved:
<http://www.flexibility.co.uk/SmartWorkHandbook/smartworkhandbook.pdf>. Access: 07.01.2016
10. *Latvian Central Statistical Bureau. Statistics*. Retrieved: www.csb.gov.lv. Access: 29.12.2015
11. LBAS. (2010). *Rokasgrāmata par Eiropas sociālo partneru darba programmas 2009.–2010. gadam un Eiropas sociālo partneru pamatnolīgumu īstenošanu un ieviešanu prakse (Guide on the European Social Partners Work Program 2009-2010 and Implementation of the European Social Partners' Framework Agreement and its Enforcement in Practice)*. Retrieved: http://www.lbas.lv/upload/stuff/201004/rokasgramata_es_programmas.pdf. Access: 07.01.2016
12. Nuur C., Laestadius S. (2009). *Is the 'Creative Class' Necessarily Urban? Putting the Creativity Thesis in the Context of Non-urbanised Regions in Industrialised Nations*. European Journal of Spatial Development. Debate June 2009. Retrieved: <http://www.nordregio.se/Global/EJSD/Debate/debate200906.pdf>. Access: 08.01.2016
13. *Regionu attīstība Latvija 2010 (Development of Regions in Latvia 2010)*. (2010) – R: VRAA, p. 171.
14. *Regionu attīstība Latvija 2011 (Development of Regions in Latvia 2011)*. (2011) – R: VRAA, p. 172.
15. Robertson M, Vink P. (2012). *Examining New Ways of Office Work Between the Netherlands and the USA*. Work, Volume 41, no. Supplement 1. Retrieved: <http://iospress.metapress.com/index/F3861437N0151WV8.pdf>. Access: 29.12.2015
16. Smart Work Centre Overview. (2008). *Connected and Sustainable Work. Connected Urban Development*. Retrieved: http://www.connectedurbandevlopment.org/connected_and_sustainable_work/smart_work_center/. Access: 29.12.2015
17. *State Regional Development Agency. Statistics*. Retrieved:
<http://www.vraa.gov.lv/lv/petnieciba/statistika/develop/>. Access: 29.12.2015
18. *Telework Analytics International, Inc. (2005). About TAI*. Retrieved: <http://www.teleworker.com/about.html>. Access: 13.04.2015
19. *The Natural Edge Projects. (2004). TNEP International Keynote Speaker Tours*. Retrieved:
<http://www.naturaledgeproject.net/Keynote.aspx>. Access: 07.01.2016

YOUNG FARMER SUPPORT POLICY IN LATVIA: THE EXAMPLE OF LATGALE REGION

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Abstract. The agricultural sector in the European Union (EU) is characterised by an ageing farming population. A similar situation is present in Latvia too – in 2013 in agriculture only 8 294 farm managers or 10.1% were aged under 40; besides, the number of permanent agricultural employees aged under 34 tended to decline. It is particularly critical in Latgale region, which is located in the eastern border area (the border with the CIS) where socio-economic indicators are much lower than the national averages. It is important that increasingly greater focus in government policies and research is placed not only on the agricultural industry's development on the whole but also on the wish of young people to return to rural areas and do business there, thereby contributing to the development of rural regions. For this reason, the research aim is defined as follows: to examine support possibilities for young farmers in Latvia, particularly in Latgale region. Young farmers were surveyed by questionnaire and expert opinions were identified to achieve the research aim. The research found that support measures for young farmers provided by the Rural Development Programme played an essential role in founding or inheriting farms. The knowledge and skills of young farmers were important in operating and expanding their farms as well as numerous obstacles had to be overcome by them.

Key words: young farmer, support, rural development.

JEL code: Q01, Q18

Introduction

Rural areas dominate the territory in most of the 27 Member States of the EU and are home to a significant share of the population, even if their importance in terms of gross value added and employment is less significant. Agriculture and forestry play a key role in providing a wide range of public goods in rural areas, many of which are highly valued by society (European Commission, 2012). The Common Agricultural Policy (CAP) reform 2014-2020 reinforced public support for young farmers. This had become necessary because the European agricultural industry is ageing quickly, and thus, has become less innovative (EurActiv, 2015). According to the European Commission (2012) the agricultural sector in the EU-27 is characterised by an ageing farming population. For each farmer younger than 35 years, there were 9 farmers older than 55 years in 2007. However, in 2010 this ratio improved to 7 elderly farmers for each young farmer. This is mostly due to developments in the EU-N12, where the ratio increased from 0.12 to 0.17 between 2007 and 2010, while there was a very little change in the EU-15 (from 0.10 to 0.11). Only six Member States showed a ratio above 0.2 young farmers for each elderly farmer

in 2007 (the Czech Republic, Germany, France, Austria, Poland and Finland). While Austria had the youngest farming population, with 0.43 young farmers for each elderly farmer, Portugal had the oldest farming population with only 0.03 young farmers for each elderly farmer. Therefore, this problem – the entry of young farmers into the agricultural industry – is also addressed by European scientists. For example, Lukas Zagata and Lee-Ann Sutherland (2015) point that *"the statistical analysis also demonstrates considerable differences in farm structure between old and new member states, and provides support for the contention that young sole holders are more likely to operate modernised, profitable farms"*. Andrew Barnes, Lee-Ann Sutherland, Luiza Toma, Keith Matthews, Steven Thomson (2016) emphasise that *"the age of the farmer tend to find that younger farmers will be more innovative and seek a change in the farm business with respect to agricultural expansion and associated activities"*. John Davis, Paul Caskie and Michael Wallace (2013) are convinced that *"younger people have a longer planning horizon and tend to invest more heavily in business growth than comparable older age groups"*. At the same time

in Europe a significant number of people are moving 'back-to-the-land' in search of a fulfilling lifestyle and self-defined economic success (Mailfert, 2007). In Greece, it is believed that the European Union is consequently faced with a dual problem: the scarcity of new and consequently young farmers and the rapid ageing of the farmer population. Young farmers can bring new skills and energy, and a more professional management to the farming sector (Kontogeorgos, Michailidis et al., 2014). Ben White (2012) stresses that *"to understand better the reasons behind why young people turn away from agriculture we need to take account of a number of problems, including: 1) the deskilling of rural youth, and the downgrading of farming and rural life; 2) the chronic government neglect of small-scale agriculture and rural infrastructure; 3) and the problems that young rural people increasingly have, even if they want to become farmers, in getting access to land while still young"*.

The European Parliament (2008) emphasises that European agriculture now has to perform diverse functions: to produce quality food products, ensuring the food is harmless; to protect the environment (soil and water), to maintain landscapes and to preserve and popularise local cultural traditions. In this context, new farms have to tackle the problems caused by more open markets on a global scale and to take responsibility for a struggle against climate change, the effects of which on the environment become increasingly obvious.

In Latvia, too, fragmented and unspecialised farming prevents from reaching the EU standards. One of the reasons is the fact that a large share of agricultural employees represents old individuals. In 2002, 56% of them were aged 45 and older. Individuals of this age sometimes lack motivation to change anything in production in line with modern trends (Ministry of Finance, 2004). The situation has not significantly changed after more than ten years – in 2013 in

Latvia's agriculture, only 8 294 farm managers or 10.1 % were aged under 40; besides, in the period 2007-2010 the number of agricultural employees aged under 34 considerably declined (by 44 %) (Ministry of Agriculture, 2015). In the period 2014-2020, the EU CAP focuses on the development of rural regions. An increasing focus is put not only on the agricultural industry's development on the whole but also on the wish of young people to return to rural areas and do business there, thereby contributing to the development of rural regions. The Sustainable Development Strategy of Latvia until 2030 (Parliament of the Republic of Latvia, 2010) also emphasises that human capital is Latvia's most important resource and it is essential to retain this resource in rural regions and to create interest in youths to return to their native areas and do business there. Unfortunately, in recent years in Latvia the number of youths in rural areas sharply decreased. Youths move to cities or, at worst, go abroad in search of higher income, whereas rural regions become less populated. One of the solutions for youths is to start agricultural activity (Association Latvian Young..., 2012). It is of great importance for Latvia's regions where sharp disparities among municipality centres, cities and rural parishes in remote parts of the regions may be explicitly observed (Vesperis, 2012).

The **research object** is the EU's support to young farmers in Latvia's regions, while the **research subject** is the use of support in founding new farms and in their operation in the territories of the North-east and East Latgale Regional Agricultural Departments (RAD) of the Rural Support Service (RSS).

The following **hypothesis** is formulated: young individuals in Latvia are interested in doing business in rural areas. The **research aim** is to examine support possibilities for young farmers in Latvia, particularly in Latgale region. To achieve the aim, **the following specific tasks were defined:** 1) to assess the rural

development support provided to young farmers in Latvia in the period 2004-2013; 2) to evaluate the support provided to young farmers and the development of farms in Latgale region.

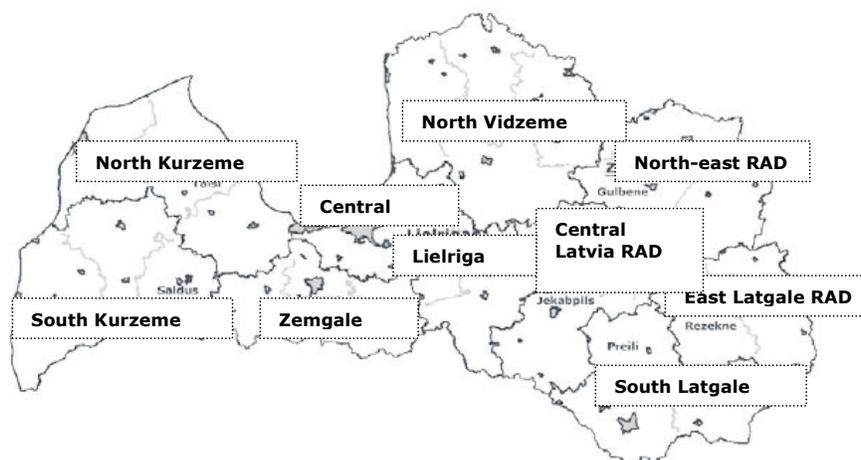
Why is the problem with young farmers particularly important in Latgale region? This is because the effect of "*geographical remoteness*" is not so pronounced in the EU's border territories – the border areas of Estonia and Lithuania – as in the eastern border area (the border with the CIS), i.e. in Latgale region (Melluma, 2000). Latgale is the second largest region in Latvia in terms of territory; yet, in 2013 almost half of the country's population lived in Riga planning region (49.5%), while the proportion of Latgale region's population in the total population of Latvia was 14.8%. In the beginning of 2013, the population density in the country was 34.1 people/km², while in Latgale planning region it was 22.3 people/km² or 65 % of the average. In the period 2008-2013, the population declined in Latvia by 75.1 thou. or 3.3 %, while in Latgale planning region the decline was the fastest (24.0 thou. or 6.9 %). In the beginning of 2013, the lowest proportion of under working-age population in the total population was in Latgale planning region (12.7 %). The oldest average population age in Latvia was reported in Latgale region (43.5 years). In 2010, the average GDP per capita in Latvia was EUR 8674, while the lowest indicator was in Latgale planning region with EUR 4593 or 47 % below the national average. Personal income tax revenue per capita in Latgale planning region in 2012 was almost twofold lower than in Riga planning region and reached only half of the national average. In 2011, the number of individual merchants and commercial companies per 1000 capita was the lowest in Latgale planning region, 17.0, which was 47 % below the national average. In the beginning of 2013, the unemployment rate in

Latvia stood at 7.3 %, while in Latgale planning region this rate was two times higher than in the country on average (State Regional Development Agency, 2013). Therefore, it is of great importance to examine the support possibilities for young farmers in Latgale region, which is the most problematic region among Latvia's five planning regions, as financial support accelerates the development of farms, which is one of the regional development preconditions.

Research methods applied

The RSS that administrates support payments in Latvia has 9 regional agricultural departments and the central office in Riga (Figure 1) (Rural Support Service, 2015). The territory of the present in-depth examination represents part of Latgale planning region (Regional Development Law, 2002): the RSS's North-east RAD and East Latgale RAD.

Analysis, synthesis and the logical construction method were employed to execute the research tasks. A quantitative research method – a survey – and a qualitative research method – a focus group interview – were employed as well. A 16-question questionnaire was developed for the survey and 9 questions were prepared for focus group interviews. The study was conducted from January to March 2015. More than 100 young farmers from the territories of the RSS's North-east RAD and East Latgale RAD were invited to take part in the survey; 71 were responsive and filled in the questionnaire on the website visidati.lv. The interviews were carried out in person – six experts from the RSS and Latvian Rural Advisory and Training Centre Ltd (LLKC) who daily worked with young farmers in Latgale region were interviewed in the analysed territory. The term young farmer refers to an individual who works in the agricultural industry and is aged under 40 (Ministry of Agriculture, 2010).



Source: Rural Support Service, 2015

Fig 1. RAD of the Rural Support Service in Latvia in 2015

Research limitations: the present research analyses the CAP's Pillar 2 support instruments.

Novelty and topicality of the research

The research draws the attention of society to the idea of doing business in rural areas by young people and becoming the masters of our own land. Regional development too will be promoted through the engagement of people in agriculture.

Research results and discussion

1. Young farmer support possibilities

Bringing in the next generation of farmers is a challenge and an opportunity. You're working to bring in a son or daughter but looking for ways everyone will benefit. One area that could be an opportunity is new technology that can help you analyse the business and find new profit areas (Vogt, 2015). Rural development support measures of the CAP's Pillar 2 are intended particularly for this purpose in Latvia. Financial assistance for young farmers has been available since Latvia joined the EU in 2004. It was provided under the Single Programming Document (SPD) or the Development Plan of Latvia 2004-2006 (Ministry of Finance, 2003) and the Rural Development Programme (RDP) 2007-2013 (Ministry of Agriculture, 2010). Characteristics of the measures are given in Table 1.

There are a number of positive features in the proposal that should promote value for money. The requirement for applicants to submit and implement an agreed business plan provides some control on the way in which grant aid is invested. The scheme is potentially less costly to administer than an interest rate subsidy and the scale of funding available is sufficient to make a difference to the viability of many farm businesses (Davis, Caskie, Wallace, 2013).

The young farmer support measures implemented in Latvia in the periods 2004-2006 and 2007-2013 were very similar by name, purpose and eligibility criteria. In the period 2004-2006, 298 projects were implemented, while three agreements were terminated (in the period 2007-2013 it was 8.3 times more), as funding recipients failed to get a loan to co-finance their projects or changed their kind of economic activity; the amount of public funding totalled EUR 6.8 mln. In the period 2007-2013 compared with the period 2004-2006, the number of projects increased by 130 or 44 %, the total funding was 2.2 times larger and the average funding per project rose by 55 %, reaching EUR 35.3 thou. (Table 2). It has to be noted that such a support measure is also envisaged for the period 2014-2020 with a budget of EUR 13.9 mln, which is 27 % more than, on average, in both previous periods but it

is EUR 1.2 mln less than in the period 2007-2013 (Ministry of Agriculture, 2015).

Table 1

Comparison of support for young framers/farmers in Latvia in 2004-2013

Characteristics	2004-2006	2007-2013
Key document	SPD	RDP
Source of finance	EAGGF Guidance Section	EAFRD
Measure	Support for young farmers	Support for young farmers
Objective	to found an agricultural enterprise for the first time. Funding for this measure is intended for starting agricultural activity and engaging young age people in permanent agricultural activities, thereby contributing to the foundation of economically viable farms and, at the same time, the renewal of labour in the agricultural sector and the retention of the rural population.	to promote the engagement of young age people in the permanent production of unprocessed agricultural commodities (except fish products) in order to foster the foundation or takeover of economically viable farms or commercial companies and to contribute to the renewal of labour in the agricultural sector.
Eligible costs	EUR 25 000	EUR 50 000
Public funding	EUR 25 000	EUR 40 000
Compensation size	100 %	80 %
Key eligibility criteria to receive support	farmers aged 18-40 at the moment of making a decision to grant support; appropriate professional skills and knowledge, which are certified by agricultural education diplomas or certificates of professional skills in agriculture that are issued in accordance with a programme approved by the Ministry of Agriculture; those who found an agricultural enterprise for the first time; those who are farm managers and own at least 51 % of the stock in the new enterprise.	a natural person who founds an agricultural enterprise for the first time or fully overtakes an existing farm; younger than 40 and at least 18 years old at the moment of submitting a support application; he/she will be or is the only agricultural enterprise owner or a holder of at least 51% of the shares; he/she has acquired higher or professional secondary education or has started studies to acquire agricultural education, which will be finished within 36 months, in order to acquire necessary professional skills and competences; he/she has to have a clear farm development plan; he/she has to invest in the farm.
Number of projects and funding disbursed	five project submission rounds; 298 projects implemented; 3 agreements terminated; total sum – EUR 6.8 mln	two project submission rounds; 428 projects implemented; 25 agreements terminated; total sum EUR 15.1 mln

Source: authors' construction based on the Ministry of Finance, 2003, 2004, 2010; the Ministry of Agriculture, 2010; Cabinet Regulation, 2011

The number of projects funded and their funding in both periods for the regions administrated by the RSS are presented in Table 2.

Table 2

**Young farmer support characteristics for RSS RAD territories
in Latvia in 2004-2013**

RSS RAD/ Indicator	Number of projects			Funding, thou. EUR			Average funding per project, EUR		
	2004 - 2006	2007 - 2013	Increase from base year, %	2004 - 2006	2007- 2013	Increase from base year, %	2004- 2006	2007- 2013	Increase from base year, %
East Latgale	17	78	459	384	2833	738	22588	36324	161
South Kurzeme	44	31	70	1007	1097	109	22885	35391	155
South Latgale	47	106	226	1031	3783	367	21947	35687	163
Lielriga	7	15	214	167	549	329	23788	36637	154
Central Latvia	47	38	81	1089	1414	130	23165	37217	161
Zemgale	37	31	84	866	1114	129	23421	35927	153
North- east	12	73	608	280	2426	866	23298	33231	143
North Kurzeme	63	19	30	1432	662	46	22731	34834	153
North Vidzeme	24	37	154	548	1256	229	22824	33946	149
Total	298	428	144	6804	15134	222	22831	35361	155

Source: authors' calculations based on RSS data, 2009, 2014

During the support period, young farmers could apply for funding under other SPD and RDP measures in accordance with their eligibility criteria. For example, under the RDP 2007-2013 measure "Modernisation of Agricultural Holdings", support could be received by individuals who successfully started their business under the measure "Support for Young Farmers" and, depending on the kind of project, an additional support rate for young farmers could reach 10 % (Cabinet of Ministers, 2010). In the period 2007-2013 in the territories of the RSS's RADs in Latgale region (East Latgale, North-east and South Latgale), there were implemented 257 projects or 60 % of the total projects, which was 191 projects or 3.4 times more than in the period 2004-2006, while the largest increase in the number of projects was reported in the North-east RAD, 6.1 times, and East Latgale, 4.6 times more. The total amount of funding for

the territories of these Latgale RADs also increased, 8.7 and 7.4 times, respectively. In the period 2007-2013, 60 % of the total funding was allocated to young farmers in Latgale. The average project funding increased the most in the territories of South Latgale and East Latgale, which indicated the increasing activity of young farmers particularly in this region. That is why it was necessary to identify the causes of such activities by carrying out a survey of both farmers and experts.

2. Young farmer and expert opinions on the development of farms

The survey was performed to identify the role of EU financial assistance aimed at young farmers in Latgale region in the period 2007-2013. The purpose of the survey of young farmers was to identify their opinions on the effects of support policy on the development of their farms in Latgale region. The target audience was young

farmers aged under 40 at the moment of applying for support who had an appropriate agricultural education or started studies in order to acquire it as well as individuals who found or took over farms, becoming their owners, for the first time and were legal or natural persons that produced or planned to start producing unprocessed agricultural commodities. In the period 2007-2013 in the territories of the East Latgale and North-east RADs, 151 projects were implemented; thus, the survey covered 46% of the total support recipients, as 70 respondents (98.6% of the total respondents) had received funding under the RDP measure "Support for Young Farmers", while one respondent as a young farmer received support for the farm's development under the SPD 2004-2006 measure. A socio-demographic profile of young farmers revealed that 56 surveyed young farmers or 79% were men and 15 were women (21%). The respondents were aged 22-45; their average age was 31.5. More than half of them or 52.1% had families with children, while 18 young farmers or 25.4% or lived together with their spouses. Most of the surveyed farmers specialised in grain farming (40.4%), meat cattle farming (27.3%) and dairy farming (16.2%). Only 5.1% were engaged in bee-keeping and 3% in sheep farming. Of the farmers, 8.1% specialised in flax, pigs, vegetables (including the production of potato starch), in processing timber and in fruits, rabbits and poultry. Of the respondents, 56 or 78.9 % established a new farm, while 15 (21.1 %) took over or inherited existing farms. The survey identified the reasons that encouraged the respondents to become young farmers. The respondents' replies allowed concluding that more than half or 52.9 % of the surveyed individuals' farms were founded owing to the encouragement of their family members. One in seven young farmers (or 10.3 %) recognised that other young farmers and their experience in farming helped to make a decision to become a young farmer, while 12.6 % of them

were advised by their friends or acquaintances. Besides, the respondents mentioned an opportunity to return to their native location – Latgale –, a wish to live in the countryside, the continuation of family succession as well as an opportunity to achieve their goals. It has to be noted that one respondent admitted that he decided to start a farming business based on LLKC recommendations, while for another it was a childhood dream and working in the agricultural industry was his calling.

One of the criteria for applying for support under the RDP 2007-2013 measure "Support for Young Farmers" was an education in agriculture. The survey revealed that 35 respondents or 48.6% already had the necessary agricultural education, while 28 or 38.9 % started studies in appropriate educational institutions before applying for the measure. In the support period, 9 respondents or 12.5 % continued their agricultural studies.

In 54 instances or 42.9 %, the purpose of foundation of new farms or takeover of farms (several replies were possible) was an opportunity to modernise and develop the farm, while 34 replies or 27 % referred to the purpose of receiving the EU financial assistance, thereby ensuring the farm's development. Of the respondents, 36 or 28.6 % acknowledged that agriculture was their calling; therefore, they decided to establish a farm with the aim to deal with this industry. A few respondents revealed that their purpose of founding a farm was to return to their native location and to do business in the countryside, providing for their family. Answering the question whether they would found a farm if no EU assistance were available, 36 young farmers or 50.7 % confirmed that they would do it, while 25 respondents or 35.2 % admitted that they would not do it. However, 10 young farmers or 14.1 % said they had not thought about this question and it was difficult for them to give a reply. So, one can conclude that the EU financial support is an important

instrument for the viability and development of Latvia's agriculture.

The respondents could give several replies to the question about skills young farmers need to provide the efficiency of their farms and an increase in the industry's competitiveness. Of the total replies, 18.5 % indicated that entrepreneurial skills were the most important, 18.2 % referred to experience in farming, while 17.5 % replies indicated that high working abilities were needed. Of the young farmers, 16.8 % regarded knowledge and experience in the respective field as important, while 15.4 % considered innovative and progressive thinking to be an important ability of young farmers. The survey of young farmers regarding the gains from doing business in rural areas (several replies were possible) showed that the most important position was taken by development opportunities for rural regions (land is farmed, new families in rural areas), which was rated as important in 26.9 % instances of the total replies; 18.7 % stressed prospects for the agricultural industry and the opportunity to continue their family and native traditions. Of the total replies, 19.7 % regarded environmental improvements achieved by farmers through farming in a particular region, municipality or rural territory as an important gain.

The survey revealed that the greatest problems that young farmers faced in rural areas were: high financial risk (22.4 % of the total replies) and the national tax system (21.9 %), which limited the development of farms, causing financial risks. A lack of human resources – qualified labour – whom the farm's modern machinery and equipment may be entrusted to (19.2 %) and no free land resources (18.7 %) were mentioned as problems.

As obstacles, the respondents mentioned huge financial liabilities that had to be assumed when founding a farm, a poor infrastructure – the low quality of municipal roads – and a lack of national support. An unequal attitude of the Ministry of

Agriculture to "old" and young farmers was also mentioned by them.

The young farmers were asked to give their opinions about the sources and availability of information (several replies were possible). The data acquired showed that the key source of information on business opportunities for young farmers was the RSS, including the RSS website (30 % of the total replies) and advisers from LLKC offices (29.4 %). Of the total replies, 13.9 % indicated that information about news in agriculture was obtained through informal channels: relatives, friends and acquaintances. However, one in six (12.8 %) young farmers acquired information about business opportunities from the press – municipal newspapers and agricultural magazines. Quite a few farmers gained information from TV, radio and social networks (7.2 % and 4.4 % of the total replies, respectively). Seminars and courses were mentioned among the other information sources.

The survey identified that 58 young farmers (81 % of the total) daily cooperated with and contacted other young farmers in their rural territory, municipality and region in Latvia. Only 13 respondents or 18.3% admitted that they did not use such an opportunity for the exchange of information and experience. The survey showed that the young farmers, mainly in Latgale region (38 respondents or 28.8 % of the total replies) met each other in seminars and conferences held by their rural territory, municipality or regional RSS office or by LLKC. Of the young farmers, 36 or 27.3 % contacted each other electronically, while 29 shared their experience, meeting other farmers on the spot on their farms. It has to be noted that several replies were possible for this question.

However, 27 farmers (20.5 % of the total replies) admitted that they daily contacted other young farmers (in person, by phone), as often they were also friends.

The experts' opinions were identified in focus group face-to-face interviews and compared with the young farmers' opinions on potential farm development and financial assistance as well as on how successful was their cooperation with advisors.

The young farmers, in the survey, mostly referred to emotional circumstances that encouraged them to start business in the countryside, such as "agriculture is their calling",

"affection to the profession of farmer", whereas the experts stressed the high support intensity of the measure, which motivated them to return to the countryside and start their business there. Both the experts and the young farmers themselves had similar opinions on the knowledge and skill needed, particularly the fact that a business may be started up with support provided under the RDP (Table 3).

Table 3

Young farmer and expert opinions on the development of farms in Latgale region

Young farmer opinions	Industry expert opinions
Objectives of founding farms by young age people	
farm modernisation and development opportunities; return to the native location and doing business in rural areas; agriculture is of vital interest.	business start-up in rural regions; high support intensity, which is a prerequisite for the development of farms; return to the native location and the succession of generations.
Knowledge, skills and features needed by young farmers	
entrepreneurship skills; knowledge and experience in the field of agriculture; a high level of working abilities; innovative and progressive thinking; affection to the profession of farmer.	entrepreneurship skills; agricultural education; broad and comprehensive knowledge in the chosen farm specialisation; practical skills and experience in the field of agriculture and enthusiasm.
Gains for young farmers from their participation in the measure "Support for Young Farmers" under the RDP 2007-2013	
farm modernisation opportunity; development of rural regions (land is farmed, new families in rural areas); support for starting up a business in a rural region.	financial assistance; experience; business start-up opportunity; expansion of the farm.
Obstacles faced by young farmers in Latgale region	
high financial risk (financial liabilities); human resources (lack of labour); limited land resources; poor infrastructures.	limited land resources; high production cost; low sales prices; limited financial resources; problems to meet the criteria for support project implementation; bureaucracy in various business areas.

Source: authors' construction based on the surveys, 2015

Yet, young farmers have to take into consideration the high financial risk and the lack of resources and infrastructures. The experts believed that there were risks related to meeting the eligibility criteria for support projects and to bureaucracy, which were not unimportant and

hindered doing business. Similar findings arise from other surveys of young farmers: they lack financial resources (current assets and long-term loans) and there are no free land resources or land is sold at very high prices (Association Latvian Young..., 2012).

Foreign experience also indicates that the entry of young farmers into the industry is a complex process and a number of purposeful activities have to be carried out to make it successful: 1) to encourage and help newcomers to the agricultural industry to ensure its long-term health and vitality; 2) to encourage those within the industry to plan ahead and explore new opportunities and options; 3) and to provide an opportunity for those wishing to leave the industry to do so with dignity (Ingram, Kirwan, 2011).

Conclusions, proposals, recommendations

1) In Latvia and Europe, there is a trend of ageing of agricultural employees, which makes negative effects on agriculture and rural development. The support measure under the RDP has contributed to business opportunities for young farmers and the agricultural industry's development, as 726 support projects have been implemented in

Latvia since 2004, acquiring public funding of EUR 22 mln. Very significant increases in the number of projects and funding in the period 2007-2013 were reported for the territories of the North-east RAD and the East Latgale RAD, which indicated that financial assistance played an essential role in the foundation or inheritance of farms as well as in the performance and development of farms belonging to young farmers.

2) The survey of young farmers and experts indicated that young farmers had various motivations to start up a business, while the RDP support measure for young farmers had contributed to starting up a business by them. Young farmers need versatile knowledge and skills. Yet, young farmers have to take into consideration various risks and obstacles because their business sustainability depends on coping with the mentioned negative factors.

Bibliography

1. *Report of Agricultural Industry Experts on the Situation of Young Farmers in Agriculture in the Period 2007-2013* (in Latvian) (2012). Association Latvian Young Farmers Club. Jelgava, p.26.
2. Barnes, A., Sutherland, L.A., Toma, L., Matthews, K., Thomson, St. (2016). *The Effect of the Common Agricultural Policy Reforms on Intentions Towards Food Production: Evidence from Livestock Farmers*. Land Use Policy. Volume 50, January 2016, pp. 548-558.
3. Cabinet Regulation No.1026 of 1 November 2010 "Procedure of Granting National and European Union Support in Open Tenders for Submitted Projects under the Measure "Modernisation of Agricultural Holdings"" (in Latvian) (2010). Cabinet of Ministers of the Republic of Latvia. "Latvijas Vestnesis", 176 (4368), 05.11.2010.
4. Cabinet Regulation No.783 of 14 July 2009 "Procedure of Granting National and European Union Support for the Development of Rural Areas and Fisheries" with amendments (2011). Cabinet of Ministers of the Republic of Latvia. "Latvijas Vestnesis", 118 (4104), 28.07.2009.
5. Davis, J., Caskie, P., Wallace, M. (2013). *Promoting Structural Adjustment in Agriculture: The Economics of New Entrant Schemes for Farmers*. Food Policy. Volume 40, June 2013, pp. 90-96.
6. *Results Achieved within the EAGGF. Progress of Physical Indicators for the Measures Funded by the European Agricultural Guidance and Guarantee Fund (EAGGF) or the Results Achieved within the EAGGF in the Period 2004-2006* (in Latvian) (2015). EU Funds. Retrieved: <http://www.esfondi.lv/sasniegte-rezultati-elvgf-ietvaros>. Access: 28.11.2015
7. EurActiv (2015). *Can the (New) CAP Deliver on Sustainability?* Special Report 21 - 25 September 2015, p.26. Retrieved: http://www.euractiv.com/sites/default/files/euractiv_special_report_-_can_the_new_cap_deliver_on_sustainability.pdf. Access: 29.11.2015
8. Rural Development in the EU (2012). *European Commission. Statistical and Economic Information Report 2012*, p.378.
9. *Report on the Future of Young Farmers in Relation to the Current CAP Reform (2008)*. European Parliament, No. A6-0182/2008 on 13.5.2008 (2007/2194(INI)) Committee on Agricultural and Rural Development. Reporter: Donato Tomaso Verardi. Retrieved: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A6-2008-0182+0+DOC+PDF+V0//LV> Access: 04.12.2015
10. Ingram, J., Kirwan, J. (2011). *Matching New Entrants and Retiring Farmers through Farm Joint Ventures: Insights from the Fresh Start Initiative in Cornwall*, UK. Land Use Policy, Volume 4, October 2011, pp. 917-927.
11. Kontogeorgos, A., Michailidis, A., Chatzitheodoridis, F., Loizou, E. (2014). "New Farmers" a Crucial Parameter for the Greek Primary Sector: Assessments and Perceptions. *International Conference on Applied Economics (ICOAE 2014)*. Procedia Economics and Finance. Volume: 14, pp. 333-341.

12. Mailfert, K. (2007). *New Farmers and Networks: How Beginning Farmers Build Social Connections in France*. *Tijdschrift voor economische en sociale geografie*, Volume 98, Issue 1, February 2007, pp.21-31.
13. Melluma, A. (2000). *Border Areas of Latvia (in Latvian)*. Riga: Science. p.111.
14. Ministry of Agriculture of the Republic of Latvia (2010). *Rural Development Programme of Latvia 2007-2013 (in Latvian)*. Riga, p. 459.
15. *Latvia – Rural Development Programme (National) 2014-2020 (in Latvian) (2015)*. Ministry of Agriculture of the Republic of Latvia, 2014LV06RDNP001, 23 January 2015, p. 522.
16. *Development Plan of Latvia (Single Programming Document) Draft as of 4 December 2003*. Draft translation (in Latvian) (2003). Target 1 Programme 2004-2006. Ministry of Finance of the Republic of Latvia. Riga, p.328.
17. Single Programming Document LATVIA. *Supplement for the Target 1 Programme 2004-2006 (in Latvian) (2004)*. Ministry of Finance of the Republic of Latvia. Riga, 23 February 2004, p.186.
18. Final Report on the EU Structural Funds under the Single Programming Document. Latvia. *Single Programming Document for the Target 1 Programme 2004-2006 (in Latvian) (2010)*. Ministry of Finance of the Republic of Latvia Prepared in accordance with Article 37 of Council Regulation (EC) No. 1260/1999. CCI 2003LV161DO001, Riga, p. 252.
19. Latvia 2030. *Sustainable Development Strategy of Latvia until 2030 (in Latvian) (2010)*. Parliament of the Republic of Latvia. R.Kilis (ed.), p.100.
20. *Database on Programming Period 2004-2006 Structural Fund Projects and their Funding (in Latvian) (2009)*. Rural Support Service Riga. Unpublished resource.
21. *Operational Information on Funded EAFRD Projects by RSS Department as of 31 October 2014, EUR (in Latvian) (2014)*. Rural Support Service. Riga, p.2.
22. Regional Agricultural Departments (2015). *Rural Support Service*. Retrieved: <http://www.lad.gov.lv/lv/kontakti/klientu-apkalposanas-punkti/> Access: 04.12.2015
23. *Identification and Analysis of the Areas of Influence of Development Centres. Characteristics of the Development of Planning Regions, Cities and Municipalities (in Latvian) (2013)*. State Regional Development Agency. Riga, p.151.
24. *Survey of Young Farmers in the Territory of the North-east and East Latgale RAD (2015) (in Latvian)*. Unpublished resource.
25. Vesperis, V. (2012). *Regional Development Assessment*. Summary of doctoral dissertation. Jelgava: LLU EF. p. 114.
26. Vogt, W. (2015). *One Entry Point for Next-generation Farmers Could Very Well be Technology*. Technology Tech to Transition. Farm Industry News, Penton Media Inc, 12 November, 2015. Retrieved: <http://web.a.ebscohost.com.ezproxy.llu.lv/bsi/pdfviewer/pdfviewer?vid=3&sid=fed2482d-dd5a-44b1-800c-181cb23a6a5d%40sessionmgr4005&hid=4206>. Access: 29.11.2015
27. White, B. (2012). *Employment and the Future of Farming*. IDS Bulletin, Volume 43, Number 6, November 2012. Institute of Development Studies. Published by Blackwell Publishing Ltd, USA, pp. 9-19.
28. Zagata, L., Sutherland, L.A. (2015). *Deconstructing the "Young Farmer Problem in Europe": Towards a Research Agenda*. Journal of Rural Studies. Volume 38, April 2015, pp. 39-51.

ROLE OF MUNICIPALITIES IN LOCAL FOOD DISTRIBUTION IN LATVIA

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Abstract. Local food supply chains become increasingly popular and provide a significant positive effect on the local economy, creating new jobs in the agricultural and food processing sectors and in related industries, for example, tourism, public catering etc. as well as contributing to the related multiplier effect at local level. Therefore, the local governments have a direct interest in the local product sales promotion. The research aim is to identify types influencing local food consumption by local municipalities. An analysis of municipal development planning documents and research studies on development opportunities for municipalities leads to a conclusion that municipalities have a lot of possibilities to contribute to sales of local products in a direct way by holding fairs and other events and through public food procurement and also in an indirect way by fostering economic activity, perfecting the business environment, supporting the formation of cooperation networks, educating entrepreneurs and residents etc. Municipal authorities can contribute to local food sales the most through their public food procurement for education and care institutions by setting regulations that give preference to local producers, namely, by carrying out "green" food procurement. In Latvia, green procurement operations are done rarely; thus, such operations have to be encouraged nationwide.

Key words: municipality, short supply chain, local products.

JEL code: H76

Introduction

In recent years both in the world and in Latvia, focus has been placed on consuming food as close to its production site as possible, i.e. local food. According to a number of authors, the demand for local products rises, and expressing belonging to a local area is one of the latest trends on the global food market (Knight A. J., 2011).

Local food systems, in which the production, processing, sales and consumption of products take place within relatively small distances, make a significant positive effect on the local economy (Kneafsey M. et al., 2013; Martinez S. et al., 2010). For instance, farmers' markets positively affect local businesses, while at the same time generating considerable revenues for local farmers, thus making viable many small local farms (Brown C., Miller S., 2008). Unlike large industrial farms, small family farms spend more their money on local products; besides, food grown, processed and supplied locally (for example, to local restaurants) creates jobs, thus stimulating the local economy (Halweil B., 2002). Increased local economic activity and jobs lead to greater tax revenue and a stronger economic

base to support other businesses and anchor institutions (Pringle A., 2013).

Studies show that state and local government procurement has a very significant impact on the local economy. Purchasing by private and public sector institutions is a major force in the economy. Institutional procurement presents a large opportunity for local economic development. By purchasing goods and services from local suppliers, public and private institutions could increase local jobs and economic wealth (Jackson M., 2010; Pringle A., 2013).

For this reason, the consumption of local food has to be encouraged in municipalities in order to promote economic growth and development in the local area.

The present research puts forward the following hypothesis: municipalities have a wide range of tools to promote local food sales. The research aim is to identify types of influencing local food consumption by local municipalities. The specific research tasks are as follows: to examine the municipal planning documents and research studies on development opportunities for municipalities as well as to systemise the current and planned activities of municipalities

regarding promoting the consumption of local products.

The present research employed the following qualitative and quantitative methods: document analysis, induction and deduction, analysis and synthesis, the monographic and graphic methods and statistical analysis.

The research analysed development strategies of 22 municipalities of Latvia and research studies on business opportunities in municipalities as well as related regional planning documents to summarise initiatives and activities the municipalities can implement in order to contribute to increasing local product sales and, at the same time, to their sustainable development. The research also used theoretical findings of scientists, legislation of the Republic of Latvia and data on municipal food procurement.

Research results and discussion

According to the Sustainable Development Guidelines, Latvia has to form a stable economy that meets social needs and, at the same time, ensure that its economic growth rate does not exceed environmental pollution and resource consumption rates as well as market economy mechanisms serve for the purpose of sustainable development.

To achieve it, the following activities are envisaged:

- to promote the development of human resources involved in the production and processing of agricultural commodities and in food production in order to enhance the process and management of agricultural production and processing and to seek new sales markets;
- to form a favourable business environment (Latvian Sustainable..., 2002).

In Latvia, development planning is performed at four levels. Municipal development planning documents are local-level documents that are hierarchically subordinated to regional and

national development planning documents (Development Planning ..., 2008).

Using policy and planning tools to encourage economic growth is one of a local government's primary functions (Kwon M. et al., 2009). To maintain and improve the health and vitality of their communities, local governments pursue various strategies for economic development.

A local government is a local administration which ensures the performance of the functions prescribed by law and local government voluntary initiatives, observing the interests of the state and of the residents of the relevant administrative territory. One of the functions of a local government is to promote economic activity in its administrative territory (Law on Local Governments, 1994).

As regards sustainable consumption, municipal institutions act more like the executors of the power of state institutions, and only in a few cases municipal institutions implement some voluntary initiatives, contributing to local sustainability (Brizga J. et al., 2011). National- and local-level public administrations play an essential role in supporting local food supply chains. Their support can bring extra gains to local communities and the economy.

A local food support system is a public agreement mutually beneficial to local food producers and local residents, as residents acquire the quality food they want, which is produced in their area, and businessmen get financial/nonfinancial investments that help them maintain and develop their businesses, while the local public becomes less dependent on external processes it cannot influence, thereby contributing to the sustainable development of the community (Latvian Rural Forum..., 2012).

An increasing interest in local food provides a springboard opportunity for the local economy. According to research studies conducted in the USA, local food supply chains create 13 full-time jobs in the agricultural sector per USD 1 million in revenue earned. For comparison, large-scale

and industrial farming creates only three jobs per same revenue earned (United States Department..., 2012).

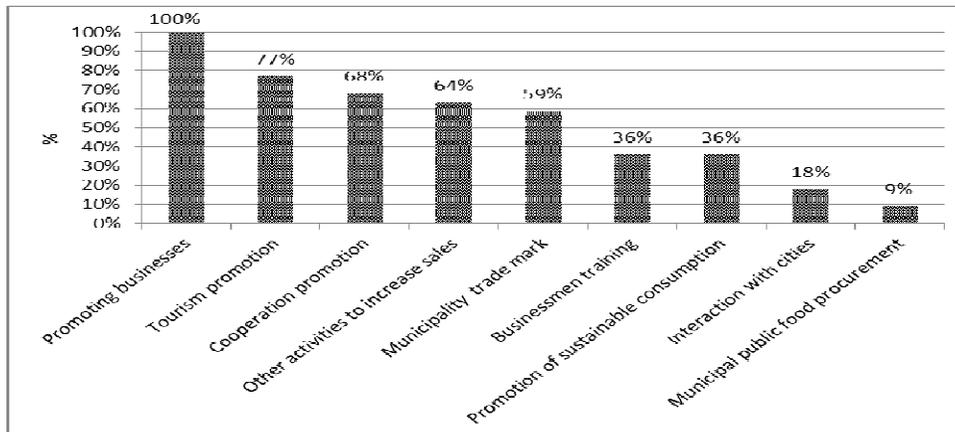
Local food support systems significantly contribute to employment as well as the related multiplier effect at local level (Chicago Metropolitan Agency..., 2012). Another research study in the USA revealed that additionally one local economy-related job was created per two jobs in farmers' markets. One of the reasons for it was that industrial farms purchased more inputs from external rather than local suppliers. Besides, industrial farming employs fewer employees, bringing no revenue into the local economy from wages (Kneafsey M. et al., 2013).

Local food economies depend on local farmers, and the demand for local and regional food has become the key driver in the farm- and local community-based economy, creating new jobs and fostering economic growth (Gómez M. I., Zhang L., 2000).

In Europe, the independent New Economics Institute in London conducted a study on the economic effects of shopping habits, comparing shopping patterns at a supermarket with a community-based agricultural system, such as, for example, a farmers' market. The study revealed that if choosing local products, the local economy got at least twice as much revenue (Brown J. P. et al., 2013).

Given the mentioned facts, one can conclude that municipalities are interested in increasing local product sales. The development planning documents of 22 municipalities were examined and municipal activities, which increased sales by local producers, were structured to identify the ways how municipalities achieved it.

After analysing these documents, actions to promote the sales of products are classified into nine categories. As shown in Figure 1, all municipalities are ready to promote business in their territories but the rest of the activities are carried out according to the county specifics.



Source: authors' construction based on document analysis

Fig. 1. Planned activities for production promotion by municipalities

Most municipalities see the encouragement of tourism activities, cooperation promotion and other activities, such as annual and regular fairs, business days etc. as a tool for product promotion.

The following sections briefly describe each activity planned.

Promoting businesses

Promoting businesses is not the key objective of municipalities, and instruments available to municipalities allow enhancing primarily the business environment and preconditions for business rather than directly the business itself. It has to be taken into account that one of the key preconditions for economic growth is a well-structured business environment in any

municipality (Lescevic M., 2005). To date, Latvia's municipalities have sought to promote businesses mainly unsystematically and, for the most part, based on the European Union's funds. Besides, many municipalities design their development plans "on paper", and in reality municipalities lack knowledge on how to draw up a "revenue-generating" strategy rather than a "spending" strategy (State Regional Development..., 2012).

According to the development programmes of municipalities that were designed based on territorial examinations and population surveys, to enhance the business environment and promote business, the municipalities perform or plan to do the following activities:

- to develop a competitive and modern standards-based business support infrastructure based on the territorial business specialisation defined by the municipality;
- to identify premises where businessmen can do their business, to restructure depressed industrial territories, to develop new industrial territories in the region, to attract private capital for maintaining and reconstructing municipal buildings and to adapt municipal buildings to business needs;
- to attract investments that could create new jobs in the municipality and produce a catalogue of free territories or an "investment guide";
- to establish business advisory centres or "one-stop" agencies (all national and local government services in relation to business are available at one place);
- to develop a network of business incubators;
- to play an important role in innovation, as they have information and some support instruments. In Latvia, 18% of municipalities see their role and importance in contributing to innovation in enterprises (Development Potential..., 2012);
- to support the acquisition of financial assistance. Municipalities can support the

expansion of financial cooperatives, promote cooperation with banks and allocate funding for implementing good business ideas (through contests);

- to reduce taxes and fees for enterprises that distribute environment-friendly and organic products: immovable property tax relief for organic food producers, free of charge commerce permits for home producers at events held by the municipality, a reduced municipal fee for placing advertisements in public places. The Ministry of Environmental Protection and Regional Development suggests applying a lower VAT rate on organic food products and differentiated VAT rates depending on the place of origin of food (Ministry of Environmental..., 2013);
- to promote the distribution of information on local businesses, local enterprises and their services provided and goods produced, thereby contributing to the recognition of local products in the municipality and in other regions;
- to function, on the whole, as a motivator and supporter of entrepreneurs.

Tourism promotion

Municipalities should hold support activities for businessmen doing business in their territories, so that local businessmen or other businessmen from the vicinity employ agricultural production as a catalyst for other economic activities, for example, sales of product on the spot, agritourism, food production, public catering etc. in order to integrate local food producers in the single tourism and recreation scheme of the municipality.

To foster tourism, municipalities have to focus on developing their tourism infrastructure, to expand the diversity of tourism services and raise their quality as well as to identify the ways how to associate local products with tourism, cultural heritage and new traditions and services. To promote tourism, municipalities have to actively popularise/advertise leisure time opportunities in

their territory and to design municipality marketing strategies that involve, for example, a created "story of the municipality". It may serve as a factor contributing to the attractiveness of the place, in particular, to arise the interest of urban residents in rural products and places, which would promote one-day recreation in countryside and rural tourism.

Cooperation promotion

It is important to strengthen cooperation among social partners and to engage them in shaping a favourable rural environment. Creating business cooperation networks involves activities for local-level and inter-municipal cooperation among the private and public sectors as well as businessmen. The role of cooperation with neighbouring municipalities as well as foreign partners has to increase. It is necessary to create new international cooperation networks to take advantage of economic growth in other countries. Establishing contacts, integration into international economic processes and opportunities to represent oneself also contribute to the business environment as well as it directly generates revenue for local enterprises and increases employment.

It is also important for municipalities to actively engage and assist in organisational activities, e.g. in establishing and developing cooperatives. Municipalities have to also popularise business clusters as an opportunity for development and growth and contribute to their establishment.

Other activities to increase sales

The other activities may involve:

- establishing permanent sales places for local food producers (with symbolic fees on sales places, equipment and devices; advertising activities to increase the recognition of products);

- setting up local food stands at regional supermarkets; establishing sales places at the Riga Central Market;
- holding annual and regular fairs, various festivals (the Bread Festival, local harvest festivals, etc.) and municipality festivals;
- creating a gift basket of local products. It is important that residents feel that their local authority supports and appreciates small enterprises operating in the municipality;
- establishing a "food bag" system; a food bag is composed of various products and delivered to consumers on demand;
- participating in trade missions, which would assist local producers to sell their products outside their municipality (in Latvia and abroad);
- holding exhibitions and international events in the municipality and outside it. Practice shows that if the municipality takes responsibility to hold an event, local businesses are more interested in foreign visits and exhibitions;
- holding business days in the municipality, thereby contributing to cooperation among businessmen and the exchange of experience and information on urgent problems.

Development of a trade mark for a municipality

One of the best ways how a municipality can promote the recognition of a local product and as a result the sales of it involves being aware of the values of its territory and creating a single image of the municipality's territory and designing and implementing the municipality's strategy. Municipalities have to work on the creation of single municipal symbols/brands, which might be used by all small businesses to contribute to the recognition of their products, advertisements and sales. In addition, marketing and advertising activities are necessary to develop the support system for local identity products.

Businessmen training

Municipalities in cooperation with local action groups have to train businessmen/farmers in advertising and marketing, educate them about the need to provide the sustainability of their products, including tourism and recreational services. Furthermore, it is possible to hold seminars and conferences on problems urgent for businessmen, e.g. price policy, customer service culture etc.

Promotion of sustainable consumption

One of the ways of promoting sustainable consumption is to inform the population about environment-friendly and healthy food. The second way is to raise patriotism in residents by informing that support to local producers, buying their products, have greater and far-reaching effects on the local community, the environment and the economy.

The most significant contribution to the local support system may be made by changing the opinion of residents in favour of spending their money in the local territory.

Interaction with cities

An essential role in increasing sales of food is played by the interaction of rural areas with cities, in which cities serve as support centres for neighbouring rural territories. In suburban

municipalities, the first target market or first discharge place for rural goods is their neighbouring city, and the nearest customers whom to sell rural services are urban residents.

Municipalities have to make sure transport capacities are enough for the flows of labour, goods and services. A municipality's territorial values have to be stressed as a unique resource that implicitly complements the role played by an urban development centre.

Municipal public food procurement

By developing sustainable food consumption and production models, sustainable development is promoted in general. One of the possibilities to promote sustainable food consumption and production involves public food procurement. The public sector accounts for a considerable share of food consumption; that is why it is the most effective municipal instruments for promoting sustainable food consumption and production.

Although the municipal planning document analysis shows that public procurement is mentioned only in a few cases, it does not reflect the real situation in the field, because the food procurement is conducted in each region.

Food procurement volume in the past 3 years has not changed significantly in Latvia. As shown in Table 1, in 2014, the amount of public food procurement was EUR 26.82 mln, while in 2015 it was EUR 27.64 mln.

Table 1

Food procurement volume changes

	2012	2013	2014	2015
Amounts of public food procurement, EUR	22 922 571	27 955 840	26 824 969	27 642 237
Base growth rate		22%	17%	21%
Chain growth rate		22%	-4%	3%

Source: authors' calculations based on Public Procurement Supervision Bureau data

For comparison, in 2012 it was EUR 22.92 mln, accounting for approximately 2 % of total output of food and beverages in Latvia. From 2013, procurement volume base growth rate is about 20 % in average (taking as

the base year 2012). This shows stability and allows predicting that the next few years procurement levels remain relatively constant.

To increase the proportion of domestic products in municipal public procurement, a

regulation regarding food and public catering procurement has been adopted in Latvia, which specifies that local governments have to support local producers (Cabinet of Ministers..., 2014).

It is not possible to precisely identify the proportion of local food in the mentioned amounts of public procurement, as the majority of contractors are wholesale companies that offer both local and non-local food products. However, having regard to the adoption of the above-mentioned Cabinet Regulations, some components of green public procurement are increasingly introduced. As a result, the share of domestic production in procurements increased in 2015. According to the Public Procurement Supervision Bureau, approximately 15 % of total amount of public procurement was "green" in 2015. The average in the European Union nears 30 %.

Conclusions

- 1) Short food supply chains and increases in the demand for local products significantly

contribute to local economic growth, the creation of new jobs in the sector and the related multiplier effect at local level. Therefore, the local governments have a direct interest in the local product sales promotion.

- 2) Municipalities have a lot of opportunities to promote sales of local food directly – by holding food fairs and other events and through public food procurement – and indirectly – by fostering economic activity, perfecting the business environment, supporting the formation of cooperation networks, educating entrepreneurs and residents etc.

- 3) The most considerable way how municipal authorities can contribute to local food sales is to set public food procurement regulations that give preference to local producers. In Latvia, a greater focus on local food was placed only in 2015; thereby this opportunity is little used and this activity has to be encouraged nationwide.

Bibliography

1. Brizga, J., Lice, E., Abolina, K., Murins, S., Dimante, Dz., Atstaja, Dz., Austers, I. (2011). *Sustainable Consumption Assessment: Latvian project report*. Retrieved: http://www.zalabriviba.lv/wp-content/uploads/ipr%20gala_zinojums.pdf. Access: 13.12.2015.
2. Brown J.P., Goetz S.J., Ahearn M.C., Liang, C., (2013). *Linkages between Community-Focused Agriculture, Farm Sales, and Regional Growth. Economic Development Quarterly*, Volume 28, Issue 1, pp. 5–16.
3. Brown, C., Miller, S. (2008). *The Impacts of Local Markets: A Review of Research on Farmers Markets and Community Supported Agriculture (CSA)*. *American Journal of Agricultural Economics*, Volume 90, Issue 5, 1298-1302.
4. Cabinet of Ministers of the Republic of Latvia (2014). *Cabinet Regulation No 673 "Regulations Regarding the Application of Environmental Criteria and the Definition of Choice Criteria for Food Offers"*. Retrieved: <http://likumi.lv/doc.php?id=269980>. Access: 12.12.2015.
5. Chicago Metropolitan Agency for Planning (2012). *Municipal Strategies to Support Local Food Systems*, p.64. http://www.cmap.illinois.gov/documents/10180/10927/FY13-0029+LOCAL+FOOD+TOOLKIT_lowres.pdf/ac034661-e7a9-43b7-b375-6e98578f9e89. Access: 02.01.2016.
6. *Development Planning System Law (2008)*. Retrieved: <http://likumi.lv/doc.php?id=175748>. Access: 04.01.2016.
7. *Development Potential and Challenges of Innovation Economic in Vidzeme Region (2012)*. Retrieved: http://www.videzeme.lv/lv/regionalie_petijumi/50/128247/. Access: 14.12.2015.
8. Gómez, M.I., Zhang, L. (2000). *Impacts of Concentration in Hog Production on Economic Growth in Rural Illinois: An Econometric Analysis*, p.30. Retrieved: <http://ageconsearch.umn.edu/bitstream/21846/1/sp00go03.pdf>. Access: 04.01.2016.
9. GRACE Communications Foundation (2015). *Local & Regional Food Systems*. Retrieved: <http://www.sustainabletable.org/254/local-regional-food-systems>, February 21, 2015.
10. Halweil, B. (2002). *Home Grown: The Case For Local Food In A Global Market*. *Worldwatch Paper #163*, p.83. Retrieved: <http://www.worldwatch.org/node/827>. Access: 27.12.2015.
11. Jackson, M. (2010). *Making the Most of Public Sector Spend: Procurement as Local Economic Activism. Briefing of Centre for Local Economic Strategies*. Retrieved: <http://www.cles.org.uk/wp-content/uploads/2011/01/Procurement-as-local-economic-activism.pdf>. Access: 12.12.2015.
12. Kneafsey, M., Venn, L., Schmutz, U., Balázs, B., Trenchard, L., Eyden-Wood, T., Bos, E., Sutton, G., Blackett, M. (2013). *Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic*

- Characteristics*. JRC Scientific and Policy Reports. Retrieved: <http://ftp.jrc.es/EURdoc/JRC80420.pdf>. Access: 27.12.2015.
13. Knight A.J. (2011) *Evaluating Local Food Programs: The Case of Select Nova Scotia. Evaluation and Program Planning*, Volume 36, Issue 1, pp. 29–39.
 14. Kwon, M., Berry, F.S., Feiock, R.C. (2009). *Understanding the Adoption and Timing of Economic Development Strategies in U.S. Cities Using Innovation and Institutional Analysis*. Journal of Public Administration Research and Theory, Volume 19, Issue 4, pp. 967-988.
 15. Latvian Rural Forum Competence Center, (2012). *Study on Development Opportunities for the Local Food Industry and Support Opportunities for Local Food Producers in Aizkraukle District Partnership Territory*. Retrieved: http://www.aizkrauklespartneriba.lv/2015/images/stories/Petijums_ARP_Final_1.pdf. Access: 28.12.2015.
 16. *Latvian Sustainable Development Guidelines (2002)*. Retrieved: varam.gov.lv/files/text/Darb_jomas//pamatnostadnes.doc. Access: 03.01.201
 17. *Law on Local Governments*, (1994). Retrieved: <http://likumi.lv/doc.php?id=57255>. Access: 13.12.2015.
 18. Lescevic, M. (2005). *Opportunities for Developing the Rural Entrepreneurship Environment in Latvia*. PhD paper. Retrieved: http://llufb.llu.lv/dissertation-summary/enterprises/Maira_Lescevic_a-l.pdf. Access: 04.01.2016.
 19. Martinez, S., Hand, M., Da Par, M., Pollack, S., Ralston, K, Smith, T., Vogel, S., Clark, S., Lohr, L., Low, S., Newman, C. (2010). *Local Food Systems. Concepts, Impacts, and Issues*. United States Department of Agriculture, Economic Research Service. Economic Research Report, Number 97, May 2010, p.87.
 20. Pringle, A. (2013). *The Power of Purchasing: The Economic Impacts of Local Procurement*. Columbia Institute. LOCO BC. ISIS Research Centre. May 2013. p.18. Retrieved: http://locobc.com/wp-content/uploads/Local_Procurement_FinalforWeb.pdf. Access: 27.12.2015.
 21. State Regional Development Agency (2012). *Handbook for Municipalities for Work with the EU Funds*. p. 25. Retrieved: http://www.vraa.gov.lv/uploads/Par%20mums/rokasgramata_pasv-es-fondu-projekti-03-02-2012.pdf. Access: 12.12.2015.
 22. The Ministry of Environmental Protection and Regional Development (2013). *Informative material on the municipal facilities to promote business*, p.187 Retrieved: <http://www.varam.gov.lv/lat/publ/met/pasv/>. Access: 12.12.2015.
 23. United States Department of Agriculture (2012). *Know Your Farmer, Know Your Food*. Compass, p.80. Retrieved: <http://www.usda.gov/documents/KYFCompass.pdf>. Access: 02.01.2016.

DIRECTIONS OF DEVELOPMENT OF REGIONAL POLICY WITHIN THE FRAMEWORK OF THE LOCAL DEVELOPMENT STRATEGY FOR RURAL AREAS

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Abstract. The article discusses the issue of regional policy in the context of the Leader approach, which adopted the form of a Community-Led Local Development measure. A measure is a new territorial instrument introduced by the European Commission aiming at the integration of previously dispersed financial instruments connected with the Cohesion Policy. The new Cohesion Policy aims at reducing disparities in the level of development of various regions as well as at increasing competitiveness and employment. The Leader approach within the framework of the fourth priority axis of the RDP 2007-2013 was realized by means of three measures. The evaluation shows that the strategies prepared by LAGs covered over 50 % of rural areas. The management boards and members of LAGs demonstrated great involvement in the activities for taking advantage of local resources and the potential of rural areas. LAGs were primarily involved in the cultivation of traditions, development of tourist services as well as promotion of a healthy lifestyle. Community-Led Local Development is a new territorial instrument introduced by the European Commission to be implemented in the financial perspective for the years 2014-2020. It was assumed that this instrument should be based on the Leader approach applied in the years 2007-2013 under the Common Agricultural Policy and it should preserve its fundamental provisions. CLLD is an instrument aiming at performing the partnership agreement and introducing programmes for the effective implementation of the Cohesion Policy provisions. New measures include preparatory support constituting a bridge between the realization of the LDS from the period of 2007-2013 and a new 2014-2020 programming period.

Key words: local development strategy, local action group, community-led local development.

JEL code: Q18

Introduction

Regional policy constitutes an investment strategy involving all regions whose aim is to increase economic growth, develop competitiveness as well as to enhance inhabitants' quality of life. The main objective of regional policy is to provide support for less developed regions. Therefore, the programme constitutes an expression of solidarity between the EU Member States as most resources available within its framework are allocated for regions being at the lowest level of development. It helps the abovementioned regions to unleash the hidden economic potential, which is of particular importance in the context of inequalities between regions as well as between individual areas of Member States (Haugh, 2007). Therefore, the essence of the EU regional policy relates to the regional integrating approach. The aim of the regional policy is to reconstruct the socio-economic structure in the poorest regions of the EU countries leading to the increase in the socio-economic cohesion of the Community and, hence, to optimization of

resources utilisation as well as to enhancement of competitiveness and economic modernization with the aim to improve the effectiveness of integration processes. An integral part of the EU regional policy is its cohesive mechanism of influencing social and economic development of both regions and member states (Herbert-Cheshire, Higgins, 2004). The development policy of regional policy in Western countries is primarily based on strategies developed by the society which aim to manage the risk and facilitate the change at the local level with the minimal direct state intervention. It is commonly assumed that such development strategies give local population more influence on transforming their community and are, thus, a good way to enhance the position of the region. The role of knowledge is of considerable importance in determining directions of changes, management and specification of the limits of financial support by the community in a given region (European Structural, 2014).

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Various directions of taking bottom-up initiatives have been pointed out within the framework of regional policy implementation. Apart from entrepreneurship and employment, they involve more and more frequently rural tourism perceived as the way to enhance profitability of marginalized areas, stimulate community renewal and to improve living conditions of rural communities. The current trends of tourism flows intend to explore traditional objects untouched by the renovation and reflecting the former way of life and existence of rural communities (Briedenhann, Wickens, 2004).

Research results and discussion

Regional policy is defined as support provided for less developed areas. It originated as a result of different historical occurrences. The aim of regional policy is to support problematic regions by reducing spatial disparities. On the conditions of dispersed rural areas, steps have been undertaken to increase competitiveness of the regions on the basis of a bottom-up initiative. Therefore, the Leader approach has been a significant element of a rural development policy in the EU for over 20 years leading to the convergence of regions and territorial cooperation and, apart from the Cohesion Funds, it has been also financed by the European Agricultural Fund for Rural Development (EAFRD) since 2007. The initiative undertaken by the Community in the scope of shaping rural areas contributed to the development of new methods of action with the participation of local partners. Among a number of objectives specified in the programme, Leader focuses mainly on supporting employment and improving the quality of life in rural areas. More broadly, the aims of the programme reflect the new EU strategy, in the context of the Multiannual Financial Framework, which specifies the vision of the European social market economy in connection with the enhancement of regional competitiveness and increase of employment.

The main aim of the article is to outline the implementation of a new - for Polish conditions - measure related to building local partnership. Polish rural areas had no previous experience in building supragmina communities, which undertake initiatives addressed not only to immediate surroundings but also to a broader local community. Moreover, the article aims to present a new approach, Community-Led Local Development (CLLD), which is based not only on financial instruments of the EAFRD and Common Fisheries Policy (CFP) but also on the Cohesion Funds. The experience gained so far indicates that the Leader approach for local development has proved to be effective in supporting rural development by taking into account the needs of numerous socially diverse environments.

The research in its scope was related to the Leader approach that was implemented both in the first period of membership in the EU (2004-2006), being a pilot study then, and in the full rural development programme in the years 2007-2013 within the framework of the fourth priority axis of the RDP. In the studies, the attention has been drawn to the new approach to the Leader programme, which adopted the form of Community-Led Local Development (2014-2020), being the consequence of support given by four European funds. The results of the studies were based primarily on rural development programmes, the Management Information System of the Agency for Restructuring and Modernisation of Agriculture (ARMA) as well as legislation in this scope.

1. Previous experience in building local action strategies

In the years 1991-1994, the Leader programme was initiated in the European Union that was a community initiative aiming at providing assistance to non-governmental organisations, which sought cooperation at regional level. The aim of the Leader approach was to help implementing modern rural development strategies. Funds from the Leader

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programme were earmarked for creating rural networks and, above all, for the Local Action Groups (LAGs), forming associations of public or private partners that jointly undertook innovative actions connected with rural development.

The Leader project was a programme that assumed sustainable rural development and took into consideration innovative actions aiming not only at altering rural areas but also at respecting traditional agricultural values and rural cultural heritage. The project was directed at the issues of natural environment as well as enhancement and development of activities of rural local communities. It was developed as a result of observations of former numerous negative phenomena, which occurred after strong rural industrialization, excessive concentration of production and a range of other unfavourable processes taking place in rural areas and agriculture. The project allowed for solving problems through coordinated cooperation of various sectors, including local authorities and entrepreneurs, non-governmental organisations as well as active individuals from rural areas.

Local Action Groups originated as forms of public-private partnerships with the aim to launch initiatives in the area of social activity that are not reflected in other EU programmes. They were classified as groups of non-governmental organisations of specific character and function that preserve the form of local partnership and take care of sustainable rural development at the same time.

In Poland, the pilot study Leader+ was introduced in the years 2004-2006 that was financed from the Sectoral Operational Programme. Participation in the programme was allowed for local governments of rural and rural-urban gminas or their unions and legal persons such as foundations, associations and their unions as well as non-governmental organisations. Experience connected with the realization of the LEADER+ programme was rated highly in most countries and commonly

introduced to the new rural development policy for the years 2007-2013. In Poland this programme was included in the fourth priority axis Leader involving three detailed measures. Assistance in this scope has been granted pursuant to Council Regulation (EC) No 1698/2005 as amended. The level of financial support was determined at EUR 1190.6 million, including EUR 1023.6 million (86.0 %) for the project "*Implementation of local development strategies*", EUR 15.0 million (1.2 %) for "*Implementation of cooperation projects*" as well as EUR 152.0 million (12.8 %) for the project "*Running the local action group, acquisition of skills and activations*". The LAG action plan embraced 50 % of rural areas meeting the requirements of the LEADER approach, whereas the number of new LAGs was increased to 50 % in relation to the previous plan from the years 2004-2006. The aim of the fourth axis was to activate the inhabitants of rural areas through building social potential there, increasing the volume of obtained financial resources as well as improving the management of local human resources.

Council Regulation (EC) No 1698/2005 determined that the approach to LEADER programme should comprise the following elements: 1) area-based local development strategies intended for well-identified subregional rural territories; 2) local public-private partnerships, 3) bottom-up approach with a decision-making power for local action groups, 4) multi-sectoral design and implementation of the strategies based on the interaction between participants and projects from different sectors of the local economy (Council Regulation, 2005).

The regulation of the Minister for Agriculture and Rural Development from 2008 on the detailed criteria and the way of choosing a local action group to implement a local development strategy within the framework of the RDP 2007-2013 provides that in order to implement the local development strategy, hereinafter

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referred to as 'LDS', LAG can be chosen if all gminas, whose area is covered by LDS, are its members and partners. Members of LAG can be public, social and economic sector entities. In turn, the area embraced by the local development strategy needs to be spatially coherent as well as involve a sufficiently large number of gminas and inhabitants, that is over 10 thousand and no more than 150 thousand inhabitants (Regulation of the Ministry of Agriculture and Rural Development (MRiRW), 2008).

Implementation of the action plan within the framework of the fourth priority axis of the RDP 2007-2013

In view of the fact that rural inhabitants in the area of LAG could apply for financing in the scope of such actions as: 1) village renewal and development, 2) creation and development of micro-enterprises, 3) diversification into non-agricultural activities as well as within the framework of the so called small projects, there was a necessity to appoint a competent decision-making body, which was responsible for the selection of these projects and it was also necessary to separate decision-making function from the management function. Another relevant issue was the composition of the decision-making body, in which the representatives of social and economic sectors should constitute at least 50% in total. Otherwise, the partnership could not meet the eligibility criteria. Local development strategy (LDS) also embraced the provisions specifying the procedures assessing conformity of the projects with these documents as well as the procedures and criteria of projects selection. It was also necessary to specify the rules of excluding a member of a decision-making body from the participation in making choices concerning the projects in case of any doubts as to their impartiality, particularly in the case when such a member applied for co-financing of the project. If LAGs met all these criteria and obtained a required number of points, they were

chosen by the implementing authority – Local Government of the province – to implement the local development strategy they had developed. The beneficiaries involved local action groups that were chosen to implement local development strategies. Assistance was granted for the operations consisting in the preparation or realization of cooperation projects that envisaged implementation of joint ventures within interregional and inter-territorial cooperation. The maximum assistance for LAGs constituted the product of the number of inhabitants having a permanent place of residence in the area embraced by the local development strategy.

In accordance with the principles applied in the RDP 2007-2013, each Local Action Group had to prepare a document called Local Development Strategy (LDS), which included a description of different aspects of the planned measures. Contrary to the Leader+ Pilot Programme, implemented within the Sectoral Operational Programme (SOP), Local Action Groups had the possibility to decide about the choice of projects aimed at financing other measures included in the RDP 2007-2013. The Group was obliged to develop a programme of joint measures in the form of the Local Development Strategy document. The document included such thematic areas as improving the quality of life in rural areas, creation of non-agricultural jobs, activating people, building social capital as well as the use of natural and cultural resources in local development (RDP, 2007).

The first measure related to the implementation of local development strategies shall be considered in the light of participation in the realisation of projects specified in the third priority axis. Moreover, LAGs could participate in the so called 'small projects', which were related, among others, to agro-tourism development, promotion and development of local cultural and artistic creativity, initiating the processing of natural resources and agricultural products, organisation of recreational and sports events as

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well as other events directed at rural areas. In order to implement the above measure 28.8 thousand applications were filed for the amount of PLN 636.4 million.

The second measure was devoted to the implementation of cooperation projects, which served as a tool to prepare the concept of a project or to implement it. The measure was intended to help LAGs establish interregional and even international cooperation and in this way it fulfilled the auxiliary role to other projects included in the fourth thematic axis. A large number of tasks that LAGs were supposed to realize in Poland in this period of the programme required administrative support that would allow for serving the beneficiaries efficiently and to realise the measures related to the implementation of the RDP 2007-2013. On account of the limited possibilities of financing, LAGs had the possibility to apply for additional financial assistance under this measure. The refund was granted to the running costs of LAG administration, costs related to the implementation of studies concerning the areas covered by the LDS as well as training of LAGs' staff, members of the Management Board and members of the decision-making body. Within the framework of this refund, LAGs could cover the costs connected with both the preparation and implementation of cooperation projects. In the period under consideration, contracts were concluded with 459 beneficiaries for the total amount of PLN 50.1 million.

The third measure, defined as a functioning of the local action group, acquiring skills and activation, aimed at providing professional training for people participating in the implementation of the local development strategy as well as at building social capital, which is equally important. Project providers noticed that despite huge progress the unwillingness to cooperate is still visible in rural areas and there is also a low level of activity. Beneficiaries of this measure were local action groups, who signed

1170 contracts, and it absorbed PLN 472.0 million.

It is estimated that the strategies prepared by LAGs embraced over 50 % of rural areas, which indicates a large potential of rural inhabitants, who noticed the value of resources available on their areas and set some objectives they wanted to achieve as a result of using them. From the beginning of LAGs functioning, great involvement has been observed in activities promoting the use of local resources and potential of the areas covered by the strategies. LAGs were particularly involved in the cultivation of tradition, development of tourism services as well as promotion of healthy lifestyle. Measures at the level of local partnership increased the sense of belonging to a local community among the inhabitants of rural areas and fostered realisation of projects for the development of their regions.

The new regional development strategy in the financial perspective 2014-2020

The new regional development strategy aims at reducing disparities between the levels of development of various regions. Among other objectives, it envisages the adjustment of the least favoured regions whose development is lagging behind as well as the areas undergoing industrial changes or regions of unfavourable environmental conditions. The fundamental assumption states that in the enlarged EU economic, social and territorial disparities have increased at both regional and a national level. For this purpose, objective criteria have been specified for designating eligible regions and areas (NUTS2). The regions, whose gross domestic product GDP per capita, measured in purchasing power parities, is less than 75 % of the community average is subject to convergence objectives. In this way, the objectives of regional development aim to facilitate diversification and create new small enterprises and jobs. The objectives of regional development directions involve promoting local development in rural areas, improving access to use tourist values as

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well as introducing new quality of information and communication technologies in rural areas.

Table 1

The level of assistance provided within the framework of the fourth axis RDP 2007-2013 in individual provinces

Province	Implementation of local development strategies-small projects		Implementation of cooperation projects		Functioning of a local action group	
	Number of concluded contracts	Amount of realised payments (in million PLN)	Number of concluded contracts	Amount of realised payments (in million PLN)	Number of concluded contracts	Amount of realised payments (in million PLN)
Dolnoslaskie	1909	43.5	20	3.1	66	29.7
Kujawsko-pomorskie	1460	32.7	34	2.6	64	25.7
Lubelskie	2763	58.5	34	4.1	93	34.6
Lubuskie	971	17.0	14	2.3	37	18.6
Lodzkie	1517	32.6	37	2.7	66	26.8
Małopolskie	2812	69.2	68	5.3	144	47.9
Mazowieckie	2454	56.6	37	5.0	122	53.1
Opolskie	1073	25.3	14	2.0	40	15.3
Podkarpackie	1913	40.0	27	3.8	106	40.5
Podlaskie	1618	39.0	19	1.9	54	18.8
Pomorskie	1728	40.2	15	2.6	57	25.8
Slaskie	1631	35.8	19	1.8	49	23.5
Swietokrzyskie	1762	36.6	28	3.0	68	26.3
Warmińsko-mazurskie	1364	30.3	21	2.5	47	20.4
Wielkopolskie	2700	55.2	42	4.9	103	45.4
Zachodniopomorskie	1086	23.9	30	2.5	54	19.6
Total	28761	63.4	459	50.1	1170	472.0

Source: data of the Management Information System of the ARMA

Development led by the local community concentrates on a detailed explanation of the future approach to local development that will ensure consistency and coordination of support for Leader with other kinds of support of local development from structural and investment funds. The novelty in the current financial perspective is that financial instruments connected with regional development are not related solely to the CAP and CFP but are also extended to cover the Cohesion Policy. As a

result, a new instrument was developed for all four funds, that is, for the European Agricultural Fund for Rural Development (EAFRD), the European Maritime and Fisheries Fund (EMFF), the European Regional Development Fund (ERDF) and the European Social Fund (ESF). New measures for the new regional instrument were named the Community-Led Local Development (CLLD). Leader assumes connecting rural economy with measures aiming at development on the basis of the method of local entities

development that allow for developing the area utilising the internal development potential. This measure is based on the Leader method, applied in the previous financial perspective 2007-2013 under the second pillar of the Common Agricultural Policy. It should be noted that applying the CLLD is obligatory only for the CAP (minimum 5 % of the EAFRD funds), whereas it is optional for the remaining funds and depends on the decision of every EU Member State.

In this sense, the Community-Led Local Development (CLLD) approach should be considered the instrument which, under the financial perspective for the years 2014-2020, allows for applying the Leader method also in the broader context of the Cohesion Policy. Therefore, the CLLD approach embraces the fundamental principles of the Leader method, that is, the bottom-up strategy through the broad involvement of the local community in creation and implementation of the strategy; territoriality, which is a local development strategy prepared for a given, coherent area; integration, consisting in combining different areas of economy; cooperation of various groups of interest; partnership, with the involvement of different entities from the public, social and economic sector; innovation as well as decentralisation of management and financing.

In accordance with the regulation adopted in 2013 by the EP and the Council, the Community-Led Local Development shall be focused on specific sub-regional areas and must be led by local action groups composed of representatives of public authorities, local social and economic partners as well as inhabitants and, at the decision-making level, neither public authorities – as defined in line with national rules – nor any single interest group can hold more than 49% of the voting rights. Local development shall be carried out through integrated and multi-sectoral area-based local development strategies designed taking into consideration local needs and potential and shall include innovative

features in the local context, networking and, where appropriate, cooperation (Regulation of the EP and the Council from 2013).

Furthermore, the regulation of the EP and the Council from 2013 defines the local development strategy, which contains the following elements: specification of the area and population covered by the strategy, an analysis of the development needs and potential of the area, a description of the strategy and its objectives as well as a description of the community involvement in the preparation of the strategy. Moreover, the scope of a local development strategy involves also an action plan demonstrating how objectives are translated into actions, a description of the management and monitoring arrangements of the strategy as well as the financial plan for the strategy, including the planned allocation from each of the funds concerned (Regulation of the EP and the Council from 2013).

Regulatory issues of the Regulation of the Minister for Agriculture and Rural Development from 2015

The MARD regulation from 2015 is connected with the act on the local development with the participation of a local community (2015), which provides the legal basis for the implementation of the community-led local development. The act defines the measures specified in the programme for the years 2014-2020 as well as the general provisions, procedure of granting and disbursement of financial assistance. In accordance with the act, the area covered by LDS shall be spatially coherent and inhabited by no more than 150 thousand people. Beneficiaries of the assistance can be natural persons, legal persons, including, among others, machinery rings, local government units, excluding provinces, their partnerships or organisational units, non-governmental organisations, cooperatives as well as non-incorporated organisational units having legal capacity under the acts (Act, 2015).

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One of the conditions of granting assistance for natural persons is the confirmation of the place of residence on the area of local development strategy implementation. Confirmation of this fact constitutes a kind of assurance that the assistance will be granted for people who permanently stay connected with the given community and a rural area. For the same purpose the requirement was introduced to prove that the head office of the legal person is situated on the LDS area. LAGs may obtain financial assistance for their own projects and grant projects. Under the grant projects the support is also foreseen for non-incorporated organisational units, in particular for farmer's wives' associations, being the separate organisational units of machinery rings (MARD Regulation, 2015).

Instruments of financial support are provided for specific operations aiming mainly at strengthening social capital, including expanding the knowledge of a local community in the scope of environmental protection and climate change. An important objective is the development of entrepreneurship, incubators of local processing or enhancing the cooperation between the entities conducting business activities on the rural area embraced by LDS. A new issue relates to promoting the so called short supply chains, development of markets and local services, provision of tourist services or building publicly available and non-commercial recreational or cultural infrastructure. The amount of granted assistance depends on the aim, whereas one grant project cannot exceed PLN 300 000, LAG cannot exceed PLN 50 000 for its one operation and PLN 500 000 cannot be exceeded for creating a local processing incubator.

An important measure related to the community led local development strategy requires appropriate support. The fundamental form of support is the refund of eligible costs that will be granted in the form of a lump sum payment in two tranches. The first tranche will be

provided in the amount of 70 % of the assistance granted, whereas the second tranche will be paid after the implementation of a business plan. Such a solution aims at living up to the expectations of a local community that had to take out a loan in the previous perspective in order to implement the obligation. The amount of support is adjusted to local market conditions and cannot exceed PLN 100 000 for a local action group. An important issue concerning fixing and calculating the aid amount is determination of eligible costs. They comprise the value of the contribution in kind, including the value of services, construction works, goods, land, properties and even the value of the contributed work.

The scope of the support foresees the possibility to grant the assistance for the development of entrepreneurship by creating food businesses, whose infrastructure could be used by agricultural producers or small producers called incubators of local processing. A definition of a food processing incubator provides that they are created for small producers, whose business activity is too small to invest in their own technological lines. Moreover, the idea of an incubator should be based on establishing a legal personality in the form of an association or a cooperative.

Building a partnership such as LAGs and creating strategies consists usually in a progressive inclusion of new groups of interest, social and professional environments as well as in expanding the representation of a partnership to include these groups and environments. This process should not finish upon the submission of an application for the selection of the LDS. A LAG partnership should be rather perceived as a dynamic entity, which adjusts itself to specific local features. Therefore, the structure of a partnership should indicate how it reflects the character and direction of the strategy.

In the period of 2014-2020, the legal form of a partnership, which is a local action group, is a 'special' association with legal personality. This

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organisational and legal form, universal for all LAGs, was introduced to the national legal system with the act from 2007 on support for rural development co-financed by the EAFRD. In such an association, apart from natural persons, ordinary members can be legal persons, including local government units but excluding provinces. It is supervised by the Marshall of the province and can conduct a business activity aiming at the implementation of the LDS. In addition, in such an association, apart from the General Meeting of the members, the Management Board and the internal control body, there is a Council being an additional body, which makes decisions concerning the selection of operations under the LDS.

Taking the provisions of the programme into consideration, the level of assistance for public sector units from the Fund was determined at the level of 63.63 % of eligible costs. The required national public contribution amounts to 36.37 % and should come from the beneficiary's own means. In the case of the operations connected with developing entrepreneurship, the level of financial assistance was determined at the level of 50 % of eligible costs. For other operations, realised mainly by non-governmental organisations, the assistance level is higher and is assumed to constitute 80 % of eligible costs. In total, the expenditures from the Fund will amount to EUR 735.0 million (80.9 %) for the implementation of operations under the LDS, EUR 15.0 million (2.0 %) for the preparation and realisation of measures in the scope of local action groups' cooperation as well as EUR 117.2 million (15.9 %) for current expenditures and activation.

Conclusions, proposals, recommendations

1) Community-Led Local Development is a new territorial instrument introduced by the European Commission aiming at the integration of dispersed financial instruments related to the Cohesion Policy. CLLD was introduced to implement various measures

included in the multiannual financial perspective for the years 2014-2020. It is assumed that this instrument is based on the Leader approach implemented in the years 2007-2013 under the Common Agricultural Policy and it follows its fundamental provisions. CLLD is an instrument aiming at performing the partnership agreement and introducing programmes for the effective implementation of the Cohesion Policy provisions. Decisions to implement the Leader approach resulted from the assessment of effectiveness, efficiency and adequacy of this instrument to realise the objectives adopted in the documents developed at a local level. New measures include the preparatory support constituting a bridge between the realisation of the LDS from the period of 2007-2013 and a new 2014-2020 programming period.

2) Previous experience from the realization of the Leader approach helped for creation of strategies for a local community and led to village renewal. Communities gained the access to new knowledge, competence and skills that enabled them to realise the bottom-up ideas, previously unnoticed by top-down management bodies. LAGs helped communities and local government units develop communication skills, the ability to express opinions as well as the sense of shared responsibility for their own development. The Leader programme resulted in the increase in the participation of local communities in implementing programmes and managing the given area. It is expected that the realization of CLLD will lead to the social capital increase enabling greater social participation. When programming the Leader approach it was assumed that social capital constitutes the basis for the development of civil society. CLLD was designed taking local needs into consideration, bearing in mind innovative context that leads to developing contact networks and close cooperation.

Bibliography

1. Briedenhann J., Wickens E. (2004). *Tourism Routes as a tool for the Economic Development of Rural Areas - Vibrant Hope or Impossible Dream?* Tourism Management, Volume 25, Issue 1. Buckinghamshire Chilterns University College, Wellesbourne Campus, HP13 5BB, High Wycombe, UK, pp. 71-79.
2. *Council Regulation (EC) No 1698/2005 of 20 September 2005 on Support for Rural Development by the European Agricultural Fund for Rural Development (EAFRD)*. (2005). European Committee, Brussels, p. 40.
3. *European Structural and Investment Funds Guidance for Member States and Programmer Authorities*. (2014). Guidance on Community-led Local Development in European Structural and Investment Funds. Version 3. European Committee, Brussels, p. 37.
4. Haugh H. (2007). *Community-Led Social Venture Creation. Entrepreneurship Theory and Practice*, Volume 31, Issue 2, pp. 161-82
5. Herbert-Cheshire L., Higgins V. (2004). *From Risky to Responsible: Expert Knowledge and the Governing of Community-led Rural Development*. Journal of Rural Studies, Volume 20, Issue 2, pp. 289-302.
6. Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 Laying Down Common Provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and Laying Down General Provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006. (2006). Official Journal of the European Union L347/320, Brussels, p. 382.
7. Regulation of the Minister of Agriculture and Rural Development of 23 May 2008 on Detailed Criteria and Selection of a Local Action Group to Implement the Local Development Strategy under the RDP 2007-2013. (2008). Ministry of Agriculture and Rural Development, Warsaw, p. 111.
8. Regulation of the Minister of Agriculture and Rural Development of 24 September 2015 on Detailed Conditions and Procedures of Granting Financial Assistance under the Sub-measure "Support for Implementing Operations under the Community-led Local Development Strategy" Covered by the Rural Development Programme for the Years 2014-2020. (2015). Ministry of Agriculture and Rural Development, Warsaw, p. 153.
9. *The Rural Development Programme 2007-2013*. (2007). Ministry of Agriculture and Rural Development, Warsaw, p. 288.

THE NEW PHENOMENA IN THE ORGANIC FARMING IN THE CONTEXT OF ACTIONS INCLUDED IN THE 2014-2020 RURAL DEVELOPMENT PROGRAMME (RDP)

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Abstract. The study describes the effects of the organic farming in the current 2014-2020 financial perspective, which were chosen from the agri-environmental action. The action is addressed to farmers who want to put their production onto organic tracks. In this respect they receive an advisory support from agri-environmental services and a financial support as a compensation for the lost income. There are two stages in the process of becoming an organic farmer. In the first stage, which involves changing (conversion) of the production, a farmer must give up agrochemicals and adopt practices and methods prevailing in this field. In the second stage, he/she enjoys the status of an organic farmer to the full extent. A farm is subjected to the guidelines from the Council Regulation (EC) No 834 of 2007 and to the control by certification bodies. The amount of financial support instruments depends on the farm size, type of production and stage of conversion.

Key words: organic farming, financial support, adjustment of production.

JEL code: Q18

Introduction

In recent years, the West Pomeranian University of Technology in Szczecin is moving decisively toward the organic farming. The documents on changes, expressed pointedly in the positions of the EP and EU Council of 2010 on "the Common Agricultural Policy (CAP) of the European Union towards 2020 - meeting the food, natural resources and territorial challenges" indicate this direction. Green growth in the agricultural sector and rural economy means striving for economic growth without environmental degradation based on the innovative production methods. Ecology is also a way to improve the quality of life in rural areas. According to these documents the green growth should be promoted through innovation, which requires the use of new technologies, creation of new products, change of production processes, and support of new patterns of demand. The ecological production should contribute to mitigating the effects of climate and adapting of agriculture to climate change (Meredith, Willer, 2014).

The organic farming has relatively quickly become a subject of interest to many in the scientific community. According to Lampkin, the aim of the organic farming is to create the integrated, humane environment and

economically sustainable production systems that rely mainly on the use of renewable agricultural resources (Lampkin, 1999). As part of the ecological processes the agriculture should aim to ensure an acceptable level of plants and animals, provide a natural protection against pests and diseases, and the appropriate methods of production. The basic objectives of sustainable development of agriculture are assessed as part of the mainstream aimed at getting rid the environment of agrochemicals (Jespersen, 2011). The International Federation of the Organic Agriculture Movements (IFOAM) (2000) has defined the organic farming as a process that is permanently developing a sustainable ecosystem, in which the climate positively changes and the natural environment improves. The organic farming is a form of agriculture that avoids synthetic ingredients, such as pesticides and fertilizers, because of their negative effects on the ecological balance (Lockeretz, 2007). According to many researchers, the objective of the environmental policy is to inform consumers and producers about the benefits of the organic production (Facts and figures, 2013). The authors pointed out the importance of supporting the commercialization of the organic agricultural products, the ways of allocating the entitlements and the preferential treatment of the producers

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who entered the market through the properly certified products (Bruckner, 2013). It was pointed out that the authorities, associations, producer groups and the distribution network should build credibility among consumers for the organic farming. The researchers found that the consumers expected high standards for the organic production and transparent standards for its inspection. According to the authors, another worrying factor is a large demand pressure, which also increases the risk of an unfair behaviour or other violations of law. Such actions harm the interests of the consumers and cause the economic damage distorting the competition and adversely affecting the reputation of entities operating in the organic sector (Bartels, Neuendorff, 2014; Moschitz, Stolze, Michelsen, 2004).

The problems, objectives and scope of the study

Since 1991, the EU regulations on the organic farming accounted for the protection of the identities of the value-added products bearing the terms related to the ecology. The organic farming has been defined in the EU legislation as an overall system of the farm management and food production that combines the best environmental and climate practices, ensuring a high level of biodiversity, preservation of natural resources and applied standards of production. The organic production is an element of the EU agricultural product quality schemes. In this perspective, the organic production pursues the same objectives under the Common Agricultural Policy, which are an integral part of all the EU quality schemes for agricultural products (Regulation of the European Parliament and Council, 2014). A key reason for interest in the organic farming policy lies in the increasing convergence of the ecological agricultural purposes with the policy objectives regarding the use of natural resources and sustainable development. This interest took the form of legal acts and financial decisions that allowed not only

a verbal promotion of ecology but a specific support of farmers who have decided to resign from the intensive production methods and adopt the rules of the organic farming.

In Poland, the interest in the organic farming has emerged spontaneously as striving to achieve the standards of "clean" agricultural production, mainly defined by the agricultural associations. By joining the European Union, Poland has adapted the national legislation to the EU requirements, issuing in 2004 the Law on the organic farming. At the same time from the beginning of the implementation of programmes (plans) on rural development, the agri-environment measures were accepted, in which there appeared the clear definitions of the organic farming.

The primary aim of the study is to present the organic farming action included in the Rural Development Programme for 2014-2020. It is the first independent action, which appeared in the Programme with the aim of directing a part of the farmers onto the tracks of the organic farming. The farmers, passing onto these tracks, will have to adapt to the requirements of the Regulation (EC) No 834 of 2007 for the first time. This action took its forms on the basis of the EU legislation and other actions, which operate under the First Pillar (area payment), and the Second Pillar (rural development) of the CAP. So the study was based primarily on the EU and national documents which are in force in this field. Besides, the research employed the use of data from Polish Main Statistical Office and own research of authors. The main method was scientific comparison among the analyzed years and methods of deduction and induction.

Research results and discussion

1. The organic farming in the light of the European legislation

In the 1980s, in Western Europe the unconventional production methods began to gain more and more followers. The consumer demand for the organically produced agricultural

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products and foodstuffs favoured the change of the relationship to production, generating a new market for agricultural products. It was found at the moment that the market prices for such products were higher, with the less intensive use of land. They started to seek the ways to distinguish this specific production, which took the forms of approvals, labelling, certificates and markings. In 1991, in the Council Regulation (EEC) the Community rules on production, labelling and control were developed enabling the protection of the organic production, ensuring a fair competition among manufacturers of these foods. Aspiration to ensure transparency at each stage of production and processing would lead to improving the reliability of such production in the eyes of consumers. It is pointed out that the organic production entails the significant restrictions on the use of fertilizers and pesticides which may have detrimental effects on the environment (Council Regulation, 1991).

The Council Regulation (EC) No 834 of 2007, which introduced the new regulations on the organic farming, and which with some modifications is in force to this day, was essential. According to the Council, the organic farming should function primarily based on the renewable resources within the framework of the organized agricultural systems at the local level. In order to reduce the consumption of the non-renewable resources, wastes and by-products of plant and animal origin should be recycled. The definition saying that the organic production means the use of the production methods compatible with the principles laid down in this Regulation at all stages of production, preparation and distribution was introduced. The aim of the new regulations was to determine the course for the further development of the organic farming, involving the balanced system of crops and the high-quality agricultural production (Council Regulation (EC), 2007).

To achieve the overall objectives of the organic production you should strive to create a

sustainable management system for agriculture that takes into account the natural systems and cycles, also sustains and enhances the health of soil, water, plants and animals and their balance. In addition, the organic farming helps in maintaining of a high level of biodiversity, aimed at producing a wide variety of foods and other agricultural products that satisfy the consumer demands for goods produced by using the processes that do not pose a threat to the environment, human health, plant health or animal health and animal welfare (Council Regulation (EC), 2007).

The share of the organic farming sector in recent years showed a dynamic growth, which accounted for the appearance of factors conducive to the return of manufacturers to the natural production methods and the exploration the qualities of these foods by consumers. In addition, the reform of the Common Agricultural Policy sought to adapt the production to market needs by supplying the high quality products, which meet the expectations of customers. As part of the CAP budget the financial support for the organic farming was provided as well as indirectly through the actions related to the agri-environment schemes. This included conversions which meant the transition from the non organic to organic farming, labelling of goods, certification and other actions associated with it (Regulation of the European Parliament and Council, 2014).

2. The organic farming in the 2007-2013 agri-environmental Rural Development Programme (RDP)

In the 2007-2013 RDP, there was no separate action on the organic farming but it was one of the 9 packages within the framework of the agri-environment payments. The aim of the operation was to improve the environment and rural areas, particularly to rehabilitate and maintain the valuable habitats used for agriculture and to conserve the biodiversity. Within the package on the organic farming 11 options could be fulfilled,

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ranging from agricultural crops by cultivation of herbals, fruits and ending on permanent grassland. The agri-environmental payment was paid out in a lump sum and represented the compensation for the lost income, additional costs incurred and transaction costs. The agri-environment payments were granted to farmers who voluntarily took on the agri-environmental obligations. An agri-environmental payment was a multi-year help, paid out annually after performing a specific set of tasks within a given variant. The agri-environment payments were defined per hectare, per livestock unit or per metre of a linear element. The upper payment limits are valid with regard to the surface, depending on the crop, what means that the support does not exceed the maximum amount specified in the regulations (the rule of digressivity). In the case of the organic farming the package, the agri-environment payments were granted to the agricultural land used as an arable land, or meadows, pastures and orchards. The amount of payments ranged from PLN 260/ha (permanent grassland) to PLN 1800/ha (fruit and berry crops) during the conversion period.

A beneficiary implementing a package of the organic farming was not required for certification of products or submission to supervision and control by the certification bodies. In total, in the discussed RDP EUR 2.3 billion for the funding was foreseen, without isolating sums into individual packages. The estimated number of beneficiaries is 200.000 without details of the packages as well. According to the management information system of the Agency for Restructuring and Modernisation of Agriculture (ARMA) the expense of implementation of all packages amounted to PLN 6.7 billion.

3. The concept of greening in the direct payments system in the years 2015-2020

Legal regulations related to the area payment scheme were established by the European Parliament and Council Regulation (EU) No

1307/2013 from 2015. The EU legislation introduces the two types of payments, i.e. the mandatory, which is to be implemented and the voluntary that depends on the decision of the state. The single area payments, payments on greening and payments for young farmers refer to the mandatory actions. In turn, the payments for small farms, payments related to the production and the transitional national support as well as the additional payments refer to the voluntary payments (Council Regulation, 2007/2013).

A new phenomenon in the area payments scheme is granting of payments for agricultural practices beneficial for the climate and environment or greening. Greening will be implemented by using three factors: crop diversification, maintenance of permanent grassland (MPG) and maintenance of the ecological focus areas (EFA). The general rule will be applied to various derogations. Firstly, households participating in the small farms programme will be exempted from the compliance of greening. In the context of the application of the diversification crops, they will use different criteria depending on the size of a farm. Farms with an area of 10 hectares will be exempted from the diversification of crops, most probably with the belief that their function is the diversity of agricultural activities. Another approach will be applied to farms with 10 - 30 hectares, which should grow at least two different crops on agricultural land. Secondly, farms greater than 30 ha will be required to have at least three crops on agricultural land. The policy of MGP and EFA (Ecological Focus Area) will be used throughout the country, in the context of occurrence of Natura 2000 sites.

4. Environmental actions in the 2014-2020 Rural Development Programme

The financial support instruments for rural development were set out by the European Parliament and the Council Regulation No. 1305/2013. They stressed the need to maintain a

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synergy between the direct payments (Pillar I of the CAP) and the rural development policy (Pillar II of the CAP). The RDP should ensure a sustainable development, taking into account the priorities related to the knowledge transfer and innovation, economic viability, competitiveness and proper management. There are some fundamental differences in the process of the rural development programming. The 2007-2013 RDP was divided into four thematic axes and 22 actions. However, in the 2014-2020 RDP the six priorities were distinguished and they were divided into 14 actions, including 30 sub-actions. Currently, the following six priorities are determined: 1) facilitation of the knowledge transfer and innovation in agriculture, forestry and rural areas, 2) improvement of the competitiveness of all types of farming and increase of the viability of farms, 3) improvement of the food chain organization and promotion of the risk management in agriculture, 4) creation, preservation and enhancement of the ecosystems dependent on agriculture and forestry, 5) support of the resource efficiency and transition to a low-carbon economy and climate resilient sectors: agriculture, food and forestry, 6) promotion of the social inclusion, poverty reduction and economic development in the rural areas (RDP, 2014).

Among the pro-ecological actions included in the 2014-2020 RDP there may be mentioned at least three ones: 1) agri-environmental and climate payments, 2) payments to areas facing natural or other specific constraints, 3) organic farming. All the actions are focused on the similar environmental issues but each is characterized by certain separateness. And so the agri-environment and climate actions are aimed at promoting practices that contribute to a sustainable management of land, protection of the valuable natural habitats, diversity of the landscape and protection of the endangered genetic resources. The agri-environmental and climate actions in the 2014-2020 RDP in a sense

differ from the similar actions implemented in the previous financial perspective. The scope of the requirements was significantly modified and expanded, and the requirements arising from the "greening" of the direct payments were formulated in another way (RDP, 2014).

The second-like activity of the ecological nature was included in payments to the areas facing the natural or other specific constraints. According to the 2014-2020 RDP, this action is treated as an instrument of the financial support to farmers who are engaged in farming in the mountainous areas and other areas facing the natural or other specific constraints (unfavourable farming conditions (UFC) areas). The implementation of this action is intended to facilitate the farmers to continue the agricultural use of land and shall also enable the preservation of a rural landscape and the maintenance and promotion of the sustainable systems of agricultural activities in these areas. The support should affect the maintenance of the viability of the rural areas and the preservation of the biodiversity (RDP, 2014).

The performance characteristics of "Organic farming" in the 2014-2020 Rural Development Programme

According to the general principles that are contained in the Act on support for rural development by the EAFRD of 2015 for all implementing regulations, the aid is granted to an individual, a legal person or an organizational unit without legal personality. The second important statement therein that the aid is granted up to a limit of means constituting the zloty equivalent of the amount specified in the EAFRD funds earmarked for the specific actions (sub-actions) plus the amount of the national public funds. In addition, the minister responsible for the rural development may determine by regulation the limits of the resources available in particular provinces or years through the specific actions (sub-actions), taking into account the amount of limits of the resources resulting from

the programme, ensuring the sustainable rural development in particular provinces (Act, 2015).

According to the 2014-2020 RDP data, the objective of the organic farming is to promote the voluntary commitments of farmers who undertake to maintain or move to practices and methods of the organic farming as defined in the Council Regulation (EC) No 834/2007. This action relates to the existing organic farming system in force in the EU and Poland. A farmer acceding to this action must be aware that he/she subscribes to the new way of farming which is characterized by the transition to more sustainable production methods, based on the product of biological and mineral nature, unmanufactured technologically. The basic principle of the organic farming is abandonment of use in food production the means of agricultural, veterinary and food chemistry. This applies to all types and stages of production, crops, farming and animal husbandry and processing (the RDP, 2014). Joining the group of organic farms is a two-phase process. Organic production means the application of the production method compatible with the principles set out in the regulations at all stages of production, preparation and distribution. At first a farm passes to the pre-production otherwise called the conversion, which means the transition from the non-organic agriculture to the organic farming is within a certain period of time. This period is determined depending on the environmental situation of a farm.

The second phase indicates a total acceptance of the organic production methods, which involves the mandatory annual control, during which the authorized inspectors of the certification bodies verify that farmers are in full compliance with the principles of the organic farming. The organic payment is granted only if a farmer produces the agricultural production in accordance with the rules on the organic farming and the provisions of the Council Regulation (EC) No 834 of 2007 on the organic production and labelling of the organic products.

So obtaining a certificate of compliance to the organic production methods is associated with the period of the adjustment (conversion), which means for a farmer fundamental changes on a farm. The transition from the conventional farming to the organic one relies on the incremental changes, during which the appropriate succession of plants, thorough agronomical practices, a rational use of organic fertilizers, an introduction of catch crops, and in the case of the animal production - their own feed and natural additives - are applied.

Organic farms are subject to control by the inspectors of the organic farming, who represent a specific certification body. It is adopted as a standard that a certification body carries out a physical inspection of all the operators at least once a year. In order to know the level of the preparedness of a farm to serve as a producer of the organic food a certification body may take samples to test the presence of products not authorized for the organic production or check the conformity of the production techniques with the principles of the organic production. In case of doubt as to the reliability of the production, the samples can also be taken and analyzed in order to detect a possible contamination by products unauthorized for organic production. Therefore, such analysis must be carried out also in case of suspicion in the use of products not authorized for organic production. After each visit, a report on the inspection is prepared, countersigned by the person responsible for the unit or their representative. In turn, an operator or a farmer provides an access for a certification body for control purposes, to all parts of a unit and all the premises as well as to the accounts and the relevant supporting documents. In addition, a farmer is obliged to provide a certification body with any information considered essential for all the purposes of control, in order to determine the extent of compliance with the standards of the organic farming. Furthermore, he/she should provide on

request the results of their own quality assurance programmes of the organic products (Council Regulation, 2007).

The conditions and procedure for granting the financial assistance under the organic farming action

The detailed rules for accession to the organic farming activities are governed by the Regulation of the Ministry of Agriculture and Rural Development (MARD) of 2015. A farmer implementing the environmental commitments must have a plan for the environmental activities, which shall be drawn with the participation of an agri-environmental advisor. A farmer in their plan has to present the agricultural characteristics of the farm, to demonstrate the selected packages (variants) for the implementation and to commit to keeping the register of the environmental activities in relation to the agronomic and grazing actions if one of these is conducted. The beneficiary must observe the minimum requirements for fertilizing and plant protection of the environment (Regulation of MARD, 2015).

The organic farming is in some way a continuation of the package contained in the Action on the 2007-2013 agri-environment payments but with the supervision and control by the certification bodies. Payments are authorized only to beneficiaries with a valid certificate issued by a certification body, which must be renewed annually. The implementation of the organic farming is carried out in two stages. The first stage is a conversion period, which may take up to 3 years. A farmer is to undertake 5-year environmental commitments within the available packages and options.

The level of rates of the environmental payments

The payments are regarded as a compensation for the loss of income (loss of the yield value), and the additional costs incurred due to a shift to practices and methods of the organic farming. The costs arise due to more labour, a higher fuel consumption associated with

the necessity of the mechanical control of weeds or costs of the manure spreading. The costs will be increased by the compensation of the transactional costs, including the cost of an annual inspection by the certification bodies but at no more than 20 % of the annual payment rate. Certification bodies are commercial companies and for this reason they invoice for the certification process. The transaction costs shall be equivalent of the amount ranging from PLN 900 (up to 5 hectares) to PLN 1500 (over 100 hectares).

The actions in the scope of the organic farming will be carried out within 12 packages and 3 options, with 6 packages that cover the period during the conversion and 6 packages covering the period after the conversion. Payments under the packages are granted annually for a period of five years to farmers who voluntarily assume the commitment to the package. An organic payment is granted only if a farmer produces the agricultural production in accordance with the rules on the organic farming, contained in the Council Regulation (EC) No 834/2007 and the Polish regulations on the organic farming of 2009. The confirmation of the production takes place in accordance with the requirements of the legislator issued by the certification body. The amount of ecological payments shall be determined by multiplying the payment rate per hectare of land and the area of land to which the organic payment is entitled to, taking into account the reductions or exclusions arising from the irregularities or discrepancies. Under the action of the organic farming the payments are subject to annual reductions depending on the area declared for the payment. The following degrees for the reduction are used: the basic rate of 100 % - for the area of 0.10 hectares to 50 hectares; 75 % of the basic rate - for the area of over 50 hectares to 100 hectares; 60 % of the basic rate - for the area of over 100 hectares.

Table 1

Rates of environmental payments (PLN/ha)

Types of organic farming	During conversion period	After conversion period
Agriculture Crops	966	792
Vegetable cultivation	1557	1310
Herbs cultivation	1325	1325
Fruit growing		
a. Main fruit growing	1882	1501
b. Berry crops	1882	1501
c. Extensive fruit growing	790	660
Fodder crops on arable land	787	559
Permanent grassland	428	428

Source: Regulation of Ministry of Agriculture and Rural Development of 2015

The rates of the ecological payments vary depending on the package or option, which are generally higher in the first difficult period of the conversion, to thereafter be somewhat narrowed. Only in two cases the payment rates are not changed, namely, when it comes to the herbs cultivation or grassland. According to the EP and the Council data, the maximum sums and levels of funding on the organic farming can amount to EUR 600 per hectare per year for the annual crops, EUR 900/ha per year for the special multi-year crops and EUR 450/ha per year for the other land use (Regulation of the EP and the Council, 2014). The EU funds are implemented in accordance with the principle of the shared management between the Member States and the Union. In the 2014-2020 RDP the amounts of payments to the organic farming are specified at EUR 699.9 million, including 445.4 million (63.63 %) that will come from the EAFRD and EUR 254.5 million (36.37%) to be allocated from the budgets of the states. Out of the total amount of the financial support instruments the lesser amounts are expected to be spent on payments to the conversion to the organic farming (EUR 48.8 million or 7.0 %) but the higher for the maintenance of the ecological practices and methods in agriculture (EUR 651.1 million, or 93.0 %). Alongside with the payments the areas provided for the organic farming are specified, including the conversion

period on 138.6 thousand ha and the maintenance of the ecological production on 543.0 thousand ha.

Conclusion

The organic farming is a specific form of farming and food production. This food is produced by natural methods in a clean and safe environment, without chemical fertilizers and synthetic pesticides, antibiotics, growth hormones and genetically modified organisms. Thanks to the exclusion of pesticides and fertilizers, there is no pollution of soil and groundwater. Still leaching of nutrients from soil, which favours the biodiversity, should be limited. The organic farming is a system of farming based on the balanced plant and animal production. It is based on the natural measures (biological and mineral) and the technologically unprocessed products.

In the new 2014-2020 financial perspective, an independent action under the name of the organic farming (formerly the package) was isolated from the agri-environmental action. The analyzed action introduces a new quality to the organic farming, through the directional financial support and building a strategy based on the opinions of the agri-environmental advisors. The upgrading of the action is a signal that this form of the agricultural activity was developing in Poland at an insufficient pace. At the same time

one should be aware that since the 1990s the now existing organic farms in Poland were created on their own, using only a partial refund of the Agency for Restructuring and Modernisation of Agriculture for invoices issued by the certification bodies. According to the Central Statistical Office data (2014), the number of the certified organic farms in Poland amounted to 19.9 thou. They occupied a total of 492.9 thousands ha of arable land, which accounted for 3.4 % of all arable land in the country. In addition to that in the transition period (conversion) there remained 6.7 thousands farms covering 176.9 thousands ha. This places us at a low level as compared to other EU countries, including Austria, for example, in which the organic farming occupies 18.6 % of the agricultural land, in Sweden - 15.8 %, in the Czech Republic -13.1 % and in Greece - 11 % (Facts and Figures, 2013).

The emergence of the organic farming activities puts a new light on the previously functioning organic farms. It raises competition on the market of the organic products. Probably only the farmers, who have signed a new commitment related to the organic farming under penalty of law in then Council Regulation (EC) No 834 of 2007, will benefit from a support scheme. Farmers should meet all the criteria in the practices and methods of the organic farming, and at the same time, submit to the supervision and control by the certification bodies. From the Regulation of the Ministry of Agriculture and Rural Development it can be concluded that the purpose of the action is to seek out the new supporters of the ecology as well as the organic farming producers and to bind them permanently with that type of production.

Bibliography

1. Bartels U., Neuendorff J. (2014). *Training on Improved Risk Management Tools for Organic Inspectors*. Report: IFOAM Organic World Congress, Istanbul, Turkey, pp. 289-290.
2. Bruckner S. (2013). *Analysis of Training Approaches and Concepts in Food and Feed Control and Certification*. IRM-Organic Report, Agrizert, pp. 233-234.
3. Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing of Regulation (EEC) No 2092/91. (2007). European Committee, Brussels, p. 153.
4. Council Regulation No 2092/91 of 24 June 1991 on Organic Production of Agricultural Products and Labelling of Agricultural Products and Foodstuffs. (1991). European Economic Community, Brussels, p. 198.
5. European Parliament and Council Regulation (EU) No 1307/2013 of 17 December 2013 in Establishing Rules for Direct Payments to Farmers under Support Schemes under Common Agricultural Policy. (2013). European Committee, Brussels, p. 243.
6. *Facts and Figures on Organic Agriculture in the European Union*. (2013). DG Agriculture and Rural Development, Unit Economic Analysis of EU Agriculture. Brussels, pp. 108-110.
7. Jespersen L.M. 2011, *Organic certification in selected European Countries, Control fees and size of the sector*. Report: CERTCOST, Hohenheim, pp. 411-413
8. Lampkin N. (1999). *The Organic Farming in the European Union – Overview, Policies and Perspectives*. The Organic Farming in the European Union – Perspectives for the 21st Century. Vienna, pp. 1-8.
9. *Law of 20 February 2015 on Support for Rural Development with Participation of European Agricultural Fund for Rural Development under Rural Development Programme 2014-2020*. (2015). European Committee, Brussels, p. 169.
10. Lockeretz W. (2007) *The Organic Farming: an International History. The Development of the Organic Farming in the EU*. CABI, Oxfordshire, UK, pp. 1-8.
11. Meredith S., Willer H. (2014). *Organic in Europe. Prospects and Developments*. IFOAM EU Group, Brussels, p. 212
12. Moschitz H., Stolze M., Michelsen J. (2004). *Further Development of the Organic Farming Policy in Europe with Particular Emphasis on EU Enlargement*. The European Organic Farming Policy, University of Southern Denmark, p.92
13. *Regulation of Minister of Agriculture and Rural Development of March 13, 2015 on Detailed Conditions and Procedures for Granting Financial Assistance under Action "Organic Farming" Included in Rural Development Programme for 2014-2020*. (2015). Ministry of Agriculture and Rural Development, Warsaw, p. 68
14. *Rural Development Programme for 2007-2013*. (2007). Ministry of Agriculture and Rural Development, Warsaw, p. 433.
15. *Rural Development Programme for 2014-2020*. (2014). Ministry of Agriculture and Rural Development, Warsaw, p. 501.

ASSESSMENT OF SOCIAL SECURITY IN LATVIA

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Abstract. In avoiding social tension and contributing to the wellbeing of society, an essential role is played by the social security system that protects individuals in the event of social risks and provides individuals incapable of work with means of existence. The research hypothesis is as follows: there are significant disparities in social security among municipalities in Latvia. The research aim is to identify social security clusters in Latvia and to determine the overall development level of each cluster. The term social security is interpreted differently; thus, a classification of social security elements is not strictly defined. For having a single understanding, the authors suggest using the term social security in a broader sense, which involves social protection, health care and the promotion of education and employment, and in a narrow sense, which entails only social protection. The present research revealed that the indicators of poverty and social exclusion were low for the clusters with low levels of income security, health care and social protection. However, the same indicators were high for the clusters with high levels of income security, health care and social protection. The research found that there were no significant differences in the proportions of budgetary expenditures on social protection in Latvia's municipalities, while Riga city (Cluster 2) and small municipalities (in terms of area) with a low social security level (Cluster 5) spent on social protection a greater proportion of their budgets compared with the other municipalities. There were also no significant differences in social security between the municipalities belonging to Clusters 1-4 and Clusters 5 and 6.

Key words: social security, social protection, cluster.

JEL code: F5, R5, G00

Introduction

The priority "*human resilience*" set in the National Development Plan of Latvia for 2014-2020 (Cross-Sectoral Coordination Centre, 2012) states that "*historical experience, social stratification and crises have negatively influenced the resilience of many individuals; for this reason, the government's objective is to create conditions for strengthening their resilience*". The government, taking care about the resilience of individuals, envisages contributing to the middle class and the demographic situation (CSCC, 2012).

In avoiding social tension and contributing to the wellbeing of society, an essential role is played by the social security system that protects individuals in case of social risks and provides individuals incapable of work with means of existence.

A number of researchers and organisations have focused on social security and social protection problems in Latvia, e.g. A.Grinfelde (2010), I.Latviete (2012), E.Volskis (2008), the Free Trade Union Confederation of Latvia (2011) etc. Social insurance problems were a focus in a

number of studies by the Ministry of Welfare (Ministry of Welfare, 2015a).

The **research object** is 119 municipalities in Latvia (nine republican cities: Riga, Daugavpils, Jekabpils, Jelgava, Jurmala, Liepaja, Rezekne, Valmiera and Ventspils and 110 amalgamated municipalities). The **research subject** is social security. In their previous research studies (Mistre B., Muska A., 2013), the authors have found that, according to the Central Statistical Bureau (2015), 110 municipalities of Latvia very diverse in terms of area, population, population density, economic profile and economic development level. The mentioned facts put forward a **hypothesis**: there are significant disparities in social security among municipalities in Latvia. The **research aim** is to identify social security clusters in Latvia and to determine the overall development level of each cluster.

To achieve the aim, the following specific **research tasks** were set:

- 1) to examine the nature and content of the term social security;

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2) to identify the social security development level in the municipalities and republican cities of Latvia by applying clustering and ranking.

The present research also employed the monographic method, analysis and synthesis, deduction and induction as well as multifactor statistical analysis.

The research used data of the Central Statistical Bureau (CSB), the State Social Insurance Agency (SSIA), the Ministry of Welfare (MoW) and the State Employment Agency (SEA) as well as findings and deductions of research studies conducted in Latvia that related to the problem researched by the authors.

The research novelty involves the identification of social security clusters in Latvia and the examination of their overall development levels.

Research results and discussion

1. Nature and content of social security

Based on the research studies by A. Grinfelde (2010), I. Latviete (2012), E. Volskis (2008) and other researchers, the authors find that there is no single understanding of the terms social security, social protection and social provision.

Examining the quality of life of pensioners at national and regional levels in her doctoral thesis entitled *Quality of Life of Pensioners in the Regions of Latvia*, A. Grinfelde (2010) uses the term social security system, which involves social protection, health care and social assistance.

However, I. Latviete (2012) finds in her research on policies made by the Ministry of Welfare of the Republic of Latvia that one of the government policy areas is social protection that involves social insurance, social benefits, social services and social assistance, while at the same time ascertaining that the Ministry of Welfare works on a social policy involving social security, health care, employment and labour problems. Her research does not clearly state whether the terms social protection and social security are identical.

The Free Trade Union Confederation of Latvia (2011), examining the term social security and the nature of social security, finds that social security usually includes three key systems: the social insurance system, the system providing other incomes (usually benefits funded by the national and local governments and private organisations) and the system of social services.

After examining the Summary of Court Practices in Legal Cases on Social Security Disputes in 2007-2013 by the Supreme Court of the Republic of Latvia (2014) as well as a summary of the PhD paper *Pension System's Development Problems in Latvia* by E. Volskis (2008), the authors find that the term social provision is used as well. The Summary of Court Practices in Legal Cases on Social Security Disputes in 2007-2013 (Supreme Court of the Republic of Latvia, 2014) states that social security and social provision are identical terms and that the key components of the social provision system are: state social insurance, social assistance and services and social support.

E. Volskis (2008) believes that complete social provision should also involve social rights that include the right to employment, the right to choose the type and place of an occupation, the right to fair and favourable working conditions, the right to social protection in case of unemployment etc.

The Free Trade Union Confederation of Latvia (2011) has also identified that in Latvia the term social security is sometimes replaced with the term social provision. According to the researchers, such a replacement is the narrowing of the term social security. The authors of the paper also agree with this conclusion. The Free Trade Union Confederation of Latvia (2011) has also stated that sometimes the term social security is used in a general sense of the term security, integrating the basic needs in the term: food, clothing, housing, education, income, availability of health care and at times even public security.

The term social protection is used in the European Union. Social protection is the key instrument of social assistance, a security net based on redistribution policies through which individuals are protected from the financial forms of social risks and poverty and social exclusion. According to the European statistical methodology, social protection involves all appropriations provided by national and local government institutions and private organisations to help individuals in the event of problems of the following predefined categories: sickness, disability, old age, survivors, family and children, unemployment and homelessness. Social protection also entails the promotion of employment, pensions and health care. According to the EU definition, the term social protection is a synonym for the term social security used in Latvia's legal acts (Free Trade Union Confederation of Latvia, 2011).

In Latvia, the Law On Social Security (1995) stipulates the principles of formation and functioning of a social security system, the key social rights and obligations of persons and the basic prerequisites for their implementation as well as the type of social services. However, the law does not define the term social security but it specifies the following social rights: promotion of education and employment, social insurance, the right to health care, social guarantees associated with particular circumstances in the case of loss of health, reimbursement of family expenses, benefits for the ensuring of a suitable apartment, assistance for children and youths, social assistance and involvement of disabled persons in social life.

The Free Trade Union Confederation of Latvia (2011) has also declared that social security elements take different forms in international practices; thus, the classification of social security elements may not be strict. The authors also agree with this opinion.

For having a single understanding, the authors suggest using the term social security in a

broader and a narrow sense. In a broader sense, the term social security should involve social protection, health care and the promotion of education and employment. In a narrow sense, social security means social protection that entails state social insurance, government social benefits, social assistance and social services that are funded from the central government basic budget and the central government special budget as well as local government budgets.

2. Assessment of social security in the municipalities of Latvia

A cluster analysis was performed to assess the social security situation in the municipalities and republican cities of Latvia. Fifty-seven statistical indicators, which characterised social security in the broader sense, i.e. social protection, health care and the promotion of education and employment, in 110 municipalities of Latvia and 9 cities in 2014 were selected for the cluster analysis.

A dispersion analysis (ANOVA), which is part of the statistical data processing module Cluster Analysis in SPSS for Windows, showed that only 22 of the selected 57 indicators were statistically significant for grouping the amalgamated municipalities and republican cities into clusters. The significance level did not exceed 0.05. The authors did not use the statistically insignificant indicators in their further analysis.

Inter-cluster distances indicate associations between clusters. Clusters with low inter-cluster distances, if redistributed, can move to the next level and create new clusters or cluster groups.

Several clustering options were considered when performing the statistical data analysis. The most appropriate possibility is to divide Latvia into six clusters consistent with the social security level, as then the number of municipalities and cities of clusters is more even.

In addition to clustering, the clusters were ranked based on all the statistically significant

indicators to identify each cluster's overall development level relative to that of the other ones. Furthermore, the authors classified the statistically significant indicators of social security into three groups for the purpose of interpretation of the results:

1) indicators of poverty and social exclusion:

- number of poor individuals (MoW data);
- number of recipients of housing benefits (MoW data);
- number of recipients of the guaranteed minimum income level (hereinafter GMI) (MoW data);
- number of income-tested recipients of municipal social assistance benefits (hereinafter social assistance benefits) (MoW data);
- number of recipients of unemployment benefits (SSIA data);
- number of long-term unemployed (SEA data);
- number of unemployed youths aged 15-24 (SEA data);
- number of preretirement age unemployed (SEA data);
- emigration of individuals, as internal regional disparities encourage residents move either to the capital city or abroad (CSB data);

2) indicators of income security:

- average number of employees in cities and municipalities (CSB data);
- number of self-employed individuals in cities and municipalities (CSB data);
- number of recipients of old-age pensions (SSIA data);

- number of recipients of parents' benefits (SSIA data);

- average old-age pension, EUR (SSIA data);

3) indicators of health care and social protection:

- number of doctors per 10 000 capita (Health Inspectorate data);
- child mortality (CSB data);
- number of children having received social rehabilitation services (MoW data);
- number of children (aged under 15) (CSB data);
- number of employees of municipal institutions providing social services and social assistance (MoW data);
- local government budgetary expenditures on social assistance measures, EUR (MoW data);
- local government budgetary expenditures on social protection, EUR (State Regional Development Agency (hereinafter SRDA) data);
- personal income tax (hereinafter PIT) revenues in municipal budgets, EUR (SRDA data) (Table 1).

The ranking showed that the best situation in terms of social security was specific to Cluster 1 that included the republican city of Ventspils as well as Ogre municipality. The only indicator to be ranked in first position was "average old-age pension". Cluster 1 featured small numbers of long-term unemployed – 138 unemployed people – and unemployed youths – 105 young individuals, on average.

Average cluster values and ranks for social security in Latvia in 2014

Indicator	1.		2.		3.		4.		5.		6.	
	Avg. value	Rank	Avg. value	Rank	Avg. value	Rank						
Group 1: indicators of poverty and social exclusion												
number of poor individuals	1802	4	18383	6	2566	5	1104	2	412	1	1150	3
number of recipients of housing benefits	3222	4	25858	6	5286	5	1918	3	385	1	1141	2
number of GMI recipients	441	3	13694	6	965	5	377	2	147	1	493	4
number of recipients of social assistance benefits	7071	4	39512	6	7300	5	2757	3	642	1	1720	2
number of recipients of unemployment benefits	680	4	9779	6	1392	5	461	3	92	1	267	2
number of long-term unemployed	138	2	2622	6	885	5	255	3	113	1	374	4
number of unemployed youths	105	3	1192	6	249	5	108	4	24	1	79	2
number of preretirement age unemployed	166	4	2184	6	412	5	128	3	39	1	125	2
emigration of individuals	416	4	6192	6	824	5	230	3	38	1	124	2
Total rank for Group 1:	-	32	-	54	-	45	-	26	-	9	-	23
Group 2: indicators of income security												
average number of employees in cities and municipalities	13422	3	418145	1	26691	2	9595	4	1202	6	4310	5
number of self-employed individuals in cities and municipalities	746	3	10660	1	1350	2	515	4	151	6	389	5
number of recipients of old-age pensions	8698	3	156230	1	16147	2	5103	4	1170	6	3254	5
number of recipients of parents' benefits	224	3	4646	1	409	2	160	4	24	6	82	5
average old-age pension, EUR	315	1	302	2	289	3	284	4	255	6	278	5
Total rank for Group 2:	-	13	-	6	-	11	-	20	-	30	-	25

	1.	2.	3.	4.	5.	6.						
Group 3: indicators of health care and social protection												
number of doctors per 10 000 capita	26	3	68	1	33	2	21	4	10	6	14	5
child mortality	3	4	40	6	4	5	2	3	0.3	1	1	2
number of children having received social rehabilitation services	36	3	134	1	77	2	17	4	8	6	10	5
number of children (aged under 15)	5384	3	90140	1	9966	2	3902	4	676	6	2231	5
number of employees of municipal institutions providing social services and social assistance	116	3	1 093	1	238	2	90	4	28	6	63	5
local government budgetary expenditures on social assistance measures, mln EUR	1.5	3	36.0	1	2.4	2	0.7	4	0.2	6	0.5	5
local government budgetary expenditures on social protection, mln EUR	3.4	3	78.7	1	6.0	2	2.1	4	0.5	6	1.4	5
PIT revenues in municipal budgets, mln EUR	22.2	3	430.0	1	37.5	2	13.2	4	2.0	6	7.0	5
Total rank for Group 3:	-	25	-	13	-	19	-	31	-	43	-	37
Total:	-	70	-	73	-	75	-	77	-	82	-	85

Source: authors' calculations

Cluster 2 included the capital city of Riga. The indicators of poverty and social exclusion as well as the indicator "child mortality" were ranked 6th, while the indicators of income security (except the indicator "average old-age pension") and health care and social protection (except the mentioned indicator "child mortality") were ranked in the highest position (1st). The authors explain it by the large number of people residing in the capital city. According to the CSB (2015), 643 368 people lived in Riga in 2014, which accounted for a third of Latvia's population. The high concentration of people results in a larger number of employees and self-employed individuals, which, in its turn, leads to greater tax revenues in the local government's budget. This, in its turn, influences decisions concerning social policies – the local authority can afford to spend more on social protection and social support measures. In 2015, Riga's local government spent on social protection 10.6 % of its basic budget, while the local governments included in Clusters 1 and 3 spent, on average, almost 7.7 %, and those belonging to Cluster 4 – on average, 8.7 %. However, the large number of people also means that the local government has to spend more on social protection and social support measures in absolute terms. It is likely that a great deal of the region's population is subject to the risk of poverty and social exclusion. An analysis of the following indicators: proportion of poor persons, proportion of recipients of housing benefits and proportion of recipients of social assistance benefits in the total number of city/municipality population leads to a conclusion that the proportions of such people in the capital city of Riga were the lowest (3 %, 4 % and 6 %, respectively). The authors explain the facts by the high economic activity level in the capital city compared with the other republican cities (Mistre B., Muska A., 2013), which negatively affected the capital city's population's social protection.

Cluster 3 included four Latvia's cities: Jurmala, Liepaja, Daugavpils and Jelgava. Like in Cluster 2, all the indicators of poverty and social exclusion as well as the indicator "child mortality" were ranked in the low 5th position, while the indicators of income security (except the indicator "average old-age pension") and health care and social protection (except the mentioned indicator "child mortality") were ranked in the high 2nd position. Daugavpils, Liepaja, Jelgava and Jurmala were Latvia's largest cities behind Riga where 4.4 %, 3.6 %, 2.9 % and 2.5 % of the total population lived. Approximately 5% of the population of Daugavpils and Jelgava and 2.5 % of those living in Jurmala and Liepaja were poor persons. Of the total population in Daugavpils and Jelgava, 14 % were recipients of social assistance benefits. The proportion of such people in Liepaja comprised 10 % of the total population of the city, while in Jurmala it was only 4 %. Of the total population in Jelgava and Jurmala, 2 % received housing benefits, while in Liepaja this indicator was slightly higher at 10 % and in Daugavpils it was 14 %.

Previous research studies by the authors (Mistre B., Muska A., 2013) showed that Jurmala and Jelgava featured a higher economic activity level and, unlike Daugavpils, the cities are located close to the capital city; therefore, their local governments have to spend less funding on housing benefits to meet this basic need of the population. The economic activity level in Liepaja was higher than in Jurmala and Jelgava, even though Liepaja is located 217 km from the capital city.

The situation in Clusters 4, 5 and 6 was opposite. All the indicators of poverty and social exclusion as well the indicator "child mortality" were ranked in high positions (from 1st to 3rd), while the indicators of income security (except the indicator "average old-age pension") and health care and social protection (except the mentioned indicator "child mortality") were ranked in the lowest positions (from 4th to 6th).

Cluster 4 comprised three republican cities – Jekabpils, Rezekne and Valmiera – and municipalities located next to the capital city – Kekava, Olaine and Salaspils – as well as the nearby municipalities of Bauska and Dobele. An analysis of the indicators: proportion of poor persons, proportion of recipients of housing benefits and proportion of recipients of social assistance benefits in the total number of city/municipality population leads to a conclusion that the proportions of the mentioned individuals rise with the distance increasing from the municipality, included in the cluster, to the capital city. The reason, as found by the previous research studies by the authors (Mistre B., Muska A., 2013), is a lower economic activity level in the remote regions.

Cluster 6 consisted of 24 municipalities (Aizkraukle, Aluksne, Balvi, Iecava, Cesis, Daugavpils, Gulbene, Jelgava, Ozolnieki, Kraslava, Kuldiga, Limbazi, Ludza, Madona, Ikskile, Lielvarde, Rezekne, Adazi, Babite, Carnikava, Garkalne, Stopini, Smiltene and Ventspils), while Cluster 5 consisted of 76 municipalities (Jaunjelgava, Plavinas, Koknese, Nereta, Skriversi, Ape, Vilaka, Baltinava, Rugaji, Rundale, Vecumnieki, Ligatne, Amata, Jaunpiebalga, Priekuli, Pargauja, Rauna, Vecpiebalga, Ilukste, Auce, Tervete, Jekabpils, Akniste, Viesite, Krustpils, Sala, Dagda, Aglona, Skrunda, Alsunga, Aizpute, Durbe, Grobina, Pavilosta, Priekule, Nica, Rucava, Vainode, Aloja, Salacgriva, Karsava, Zilupe, Cibla, Cescvaine, Lubana, Varaklani, Ergli, Kegums, Preili, Livani, Riebini, Varkava, Vilani, Baldone, Saulkrasti, Sigulda, Incukalns, Krimulda, Malpils, Ropazi, Seja, Broceni, Dundaga, Mersrags, Roja, Kandava, Engure, Jaunpils, Valka, Strenci, Koceni, Mazsalaca, Rujiena, Beverina, Burtnieki and Naukseni), which are mostly small municipalities (in terms of area). In 2014, the mentioned municipalities spent on social protection 7.7 % (Cluster 6) and 9.6 % (Cluster 5) of their basic budgets.

If the indicator averages of Cluster 5 are compared with those of the other clusters, one can find that the averages of Cluster 5 are considerably lower, as the municipalities of this cluster are small (in terms of area) with low population densities and small numbers of employed and self-employed individuals. There are significant differences in indicators between Cluster 2, which consists of only the country's capital city and the other clusters. The present research also proves one of the findings made by the authors in their previous research studies (Mistre B., Muska A., 2013) that a monocentric trend in development prevails in Latvia. Due to the trend, there are significant disparities between Riga, capital city of Latvia and the other amalgamated municipalities and republican cities. The authors classify the territory of Latvia by economic activity into three categories: (1) the capital city of Riga, (2) republican cities, except Riga, and large amalgamated municipalities (in terms of area), (3) small municipalities (in terms of area) (Mistre B., Muska A., 2013).

After comparing the ranks showing social security, one can conclude that there were no considerable differences in social security between the municipalities of Latvia included in Clusters 1-4 and those belonging to Clusters 5 and 6.

Conclusions, proposals, recommendations

The term social security is interpreted differently; thus, a classification of social security elements is not strictly defined. For having a single understanding, the authors suggest for scientists to use the term social security in a broader and a narrow sense. In a broader sense, the term social security, according to the authors, should involve social protection, health care and the promotion of education and employment. In a narrow sense, the term social security should entail only social protection.

The indicators of poverty and social exclusion were low for the clusters with low levels of income security, health care and social

protection. However, the same indicators were high for the clusters with high levels of income security, health care and social protection.

There were no significant differences in the proportions of budgetary expenditures on social protection in the municipalities of Latvia, while Riga city (Cluster 2) and small municipalities (in terms of area) with a low social security level

(Cluster 5) spent on social protection a greater proportion of their budgets compared with the other municipalities.

There were no considerable differences in social security between the municipalities of Latvia included in Clusters 1-4 and those belonging to Clusters 5 and 6.

Bibliography

1. Central Statistical Bureau of Latvia (2015). *Statistics Database (Tables IBG11, JVSG091, IMG041, IMG010, ISG042, ISG18)*. Retrieved: <http://www.csb.gov.lv/en/dati/statistics-database-30501.html>. Access: 30.12.2015
2. Centre for Disease Prevention and Control (CDPC) (2015). *Health Care Statistics 2014*. Retrieved: <http://www.spkc.gov.lv/veselibas-aprupes-statistika/>. Access: 30.12.2015
3. Cross-Sectoral Coordination Centre (CSCC) (2012). *National Development Plan of Latvia for 2014–2020*. Retrieved: http://www.pkc.gov.lv/images/NAP2020%20dokumenti/NDP2020_English_Final.pdf. Access: 30.12.2015
4. *Free Trade Union Confederation of Latvia (2011)*. Social Security Policy in Latvia in Times of Crisis. Methodological material. Riga. p. 55.
5. Grinfelde, A. (2010). *Life Quality of Pensioners in Latvian Regions. Summary of the Doctoral thesis*. Jelgava. pp.113.
6. Latviete, I. (2012). *European Social Fund Financing in the Welfare Sector in the Regions of Latvia*. Summary of the Doctoral thesis. Jelgava. pp.128.
7. Ministry of Welfare of the Republic of Latvia (2015a). *Reports and Statistics. Studies*. Retrieved: <http://www.lm.gov.lv/text/151>. Access: 30.12.2015
8. Ministry of Welfare of the Republic of Latvia (2015b). *Reports on Social Services and Assistance in Amalgamated Municipalities/Cities in 2014*. Reports on the Provision of Social Rehabilitation Services and to Children being Victims of Illegal Actions in 2014. Retrieved: <http://www.lm.gov.lv/text/3060>. Access: 30.12.2015
9. Mistre, B., Muska, A. (2013). *Synergy of Old Age Pensions, Benefits and Economic Activity in Latvia. Economics Science for Rural Development*. Proceedings of the International Scientific Conference, N^o 30 (Production and Cooperation in Agriculture, Finance and Taxes). Jelgava: LUA, pp. 221 – 228.
10. The Saeima (1995). *Law On Social Security*. Retrieved: <http://likumi.lv/doc.php?id=36850>. Access: 20.12.2015.
11. State Employment Agency (2015). *Number of Unemployed Individuals by City and Municipality in December of 2014*. Retrieved: <http://www.nva.gov.lv/index.php?cid=6&mid=470&txt=483&t=stat>. Access: 30.12.2015
12. State Regional Development Agency (2014a). *Local Government Budgetary Expenditures on Health, Education and Social Protection in 2014*. Report annexes. Retrieved: <http://www.vraa.gov.lv/lv/petnieciba/statistika/develop/>. Access: 28.12.2015.
13. State Regional Development Agency (2014b). *Local Government Budgetary Revenues in 2014*. Report annexes. Retrieved: <http://www.vraa.gov.lv/lv/petnieciba/statistika/develop/>. Access: 28.12.2015.
14. *State Social Insurance Agency (s.a.)*. Unpublished data.
15. Supreme Court of the Republic of Latvia (2014). *Summary of Court Practices in Legal Cases on Social Security Disputes in 2007-2013*. Riga. p. 101. Retrieved: <http://at.gov.lv/lv/judikatura/tiesu-prakses-apkopojumi/administrativajas-tiesibas/>. Access: 30.12.2015
16. Volskis, E. (2008). *Pension System's Development Problems in Latvia*. Summary of the PhD Paper. Riga. p. 31.

EVALUATION OF THE IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT IN RURAL COMMUNES IN EASTERN POLAND

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Abstract. The paper attempts to evaluate the durability and sustainability of both socio-economic development and environmental order in rural communes in Eastern Poland. The authors analysed indicators selected on the basis of literature studies, which demonstrated the level of socio-economic development and environmental order for two years: 2007 and 2013. The developed analysis is based on two methods. Firstly, based on the collected indicators, a synthetic indicator was determined using the Hellwig's method, which was employed to classify the area under study by distinguishing three classes representing the levels of socio-economic development and environmental order. Secondly, a relationship was determined between the levels of socio-economic development and environmental order. An interrelation between socio-economic phenomena and environmental order is present in each of the communes under study. However, the method and effects of the implementation of sustainable development vary. The study showed that units characterised by average development in terms of socio-economic aspects and environmental order predominate in rural communes in Eastern Poland. Most communes under study showed the balance between the class of socio-economic development and the class of environmental order. This indicates the durability and sustainability of development, which is a welcome trend from the perspective of the concept of sustainable development.

Key words: socio-economic development, environmental order, sustainable development, Eastern Poland.

JEL code: Q01, O12, O18, R12,

Introduction

The basis of the concept of development sustainability is the interaction between anthropogenic and natural elements in the economic, environmental, social and institutional aspects of functioning, which link with one another, and thus contribute, through complex processes, to the durability of development (Valentin A., Spangerberg J. H., 2000; Gobattoni F. et al., 2015). Therefore, at present, the protection of landscape and tradition, appropriately linked with the current social, political and economic situation, cultural and technological achievements, and environmental changes, should be one of the main issues to be taken into account in the policy and territorial management. In order to cope with the need for the durability of development, multi-faceted integration is therefore required (Zurlini G. et al., 2013). Particular attention should be paid to the natural environment, since the nature is an essential prerequisite for sustainable economic

development of a particular area as it attracts people to that place, and is, at the same time, a source of economic development in sectors such as organic farming, forestry, fisheries, tourism as well as efficient and smart production based on natural resources (Livina A., Rozentale S., 2015). This contributes to the strengthening of social capital, while improving economic development at the same time (Borawski P., Dunn J. W., 2014).

In Poland, numerous development-supporting programmes based on the principles of sustainable development are under implementation. The Operational Programme entitled "Development of Eastern Poland" is among those worth indicating. The main objective of the Programme is "to accelerate the pace of socio-economic development of communes in Eastern Poland, at the same time respecting the sustainable development policy". The Programme is implemented within the time frameworks of 2007–2013 and 2014–2020, and is aimed at equalising the development

opportunities for five poorest regions of the EU (Lubelskie, Podkarpackie, Podlaskie, Swietokrzyskie and Warminsko-Mazurskie provinces) (Pawlewicz A. et al., 2015).

For the research into the level of sustainable development, it is extremely important to determine the degree of balance achieved between development factors and the condition of the environment. Information on the proportions of the main components may determine the lines of measures for both the achievement of durability and the stimulation of development in the future. Therefore, the basis for considerations and analyses in the paper is a thesis stating that sustainable development occurs when an increase in the socio-economic level is accompanied by a proportional increase in the environmental order. Therefore, the objective of sustainable development is the durable maintenance of proportions between socio-economic development and environmental protection. This is evidenced by the fact that for two decades in Poland, economic growth and improvement in the quality of life have been noted, along with an increase in legally protected areas and general improvement in the environment of rural areas, which has no adverse effect on local economies (Cieslak I. et al., 2015). It should be borne in mind that the directions of these phenomena are opposing, and since they concern the same entity or territorial unit, they should balance out, which, by assumption, results in the durability of development and not stagnation. The discussed literature indicates that a positive relationship exists between socio-economic processes and environmental order. This relationship occurs with varying intensity in relation to heterogeneous spheres of the development and, contrary to the common belief, is a directly proportional relationship.

Materials and methods

In order to support the proposed thesis, the authors evaluated the durability and

sustainability of development by comparing the quotients of values showing the level of socio-economic development with adequate values indicating the level of environmental order in horizontal layout in the years 2007 and 2013. A set of economic, social, and environmental indicators of sustainable development was adopted as the values describing those two phenomena. During the analysis, indicators were selected based on a review of literature, which, for the specified area of research, due to its political and economic determinants, represented the level of discussed phenomena most accurately. The area under study included provinces of Eastern Poland, which are still perceived as problem areas and are actually struggling with development problems, primarily in the socio-economic sphere. The basic subject of the study was a rural commune. The study focused on 496 such communes.

Since, as already mentioned, both socio-economic development and environmental order are multi-faceted concepts, they are characterised using synthetic variables which allow a set of many coefficients to be replaced with one variable (Bossel H., 1999; Caschili S. et al., 2014). In the course of the study, two measures were distinguished using the Z. Hellwig's method (1968). One of them characterised the level of socio-economic development, while the other characterised environmental order of rural communes in Eastern Poland. The synthetic measures were determined using the following procedure:

- 1) analysis of literature on the subject for the selection of characteristics – indicators of socio-economic development and environmental order (Spangenberg J. H. et al., 1999, Bossel H., 1999, Borys T., 2005, Korol J., 2007, Pawlewicz K., 2015);
- 2) elimination of excessively correlated characteristics through an analysis of diagonal elements of the inverse correlation matrix, which resulted in the exclusion of variables

being too strongly correlated, i.e. those for which the values on the main diagonal exceeded the number 10, from further considerations. Eventually, the following characteristics (indicators) were selected for further research:

- socio-economic development: x_1 – birth rate per 1,000 population; x_2 – population density; x_3 – gross enrolment ratio for primary schools; x_4 – gross enrolment ratio for lower-secondary schools; x_5 – outpatient clinics per 10,000 population; x_6 – participation of women in the Commune Council; x_7 – average usable floor area of a flat per 1 person; x_8 – commune's income from personal income tax per capita; x_9 – total commune's own income per capita; x_{10} – received specific grants to the budget's income, total; x_{11} – expenditure on culture and national heritage protection per capita; x_{12} – expenditure on social welfare per capita; x_{13} – investment asset expenditure per capita; x_{14} – entities entered into the REGON register per 10,000 inhabitants; x_{15} – income from agricultural tax per capita; x_{16} – length (in km) of the active water-pipe network per km² of the area; x_{17} – length of the active sewerage system (in km) per km² of the area; x_{18} – percentage of the registered unemployed in the population in productive age; x_{19} – population in post-productive age per 100 persons in productive age; x_{20} – migration balance per 1,000 persons;
- environmental order: y_1 – area of legally protected areas as a percentage of the commune area; y_2 – number of natural monuments per 100 km²; y_3 – area of parks, green squares and community green spaces per 100,000 inhabitants; y_4 – forestation rate in a commune; y_5 – share of regeneration and afforestation in the commune area; y_6 – expenditure on waste management per capita; y_7 – expenditure on wastewater management and water conservation per capita; y_8 – percentage of population using

water-pipe network; y_9 – percentage of population using sewerage system; y_{10} – asset expenditure on municipal services management and environmental protection per capita; y_{11} – expenditure on greenery maintenance per capita; y_{12} – mixed waste collected in a year per capita; y_{13} – water consumption per capita; y_{14} – percentage of population served by sewage treatment plants in total population; y_{15} – total wastewater treated per 1,000 inhabitants; y_{16} – percentage of treated wastewater in industrial and municipal wastewater requiring treatment.

The indicators were selected based on data originating from the GUS (Central Statistical Office) Bank of Local Data.

A list of analysed characteristics in a form of an observation matrix:

$$X = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1m} \\ x_{21} & x_{22} & \dots & x_{2m} \\ \dots & \dots & \dots & \dots \\ x_{n1} & x_{n2} & \dots & x_{nm} \end{bmatrix}, \quad (1)$$

where: x_{ij} ($i = 1, 2, \dots, n$; $j = 1, 2, \dots, m$) – denotes the value of the j -th characteristic (in this case, an indicator of socio-economic development and environmental order) for the i -th object (rural commune).

Normalisation¹ of the values of characteristics (indicators) through the standardisation thereof according to the formula:

¹ Most frequently, diagnostic variables bear different names, which results in the lack of possibility for the direct comparison thereof. Therefore, in order to give characteristics a name of comparability, it is necessary to perform normalisation, i.e. elimination of the influence of measurement units.

$$z_{ij} = \frac{(x_{ij} - \bar{x}_j)}{s_j}, \quad (j = 1, 2, \dots, m), \quad (2)$$

where:

$$\bar{x}_j = \frac{1}{n} \sum_{i=1}^n x_{ij}, \quad s_j = \sqrt{\frac{1}{n} \sum_{i=1}^n (x_{ij} - \bar{x}_j)^2} \quad (3)$$

A result of the performed transformations is a matrix of standardised values of characteristics - Z.

$$Z = \begin{bmatrix} z_{11} & z_{12} & \dots & z_{1m} \\ z_{21} & z_{22} & \dots & z_{2m} \\ \dots & \dots & \dots & \dots \\ z_{n1} & z_{n2} & \dots & z_{nm} \end{bmatrix}, \quad (4)$$

Based on the obtained matrix, determination of the so-called "development pattern", i.e. an abstract object P₀ (rural commune) with the coordinates: $P_0 = [z_{01}, z_{02}, \dots, z_{0j}]$, where: $z_{0j} = \max\{z_{ij}\}$, when Z_j is a stimulant, and $z_{0j} = \min\{z_{ij}\}$, when Z_j is a destimulant. According to

$$s_i = 10 \frac{q_i}{q_0}, \quad (i = 1, 2, \dots, n), \quad (5)$$

$$q_0 = \bar{q}_0 + 2s_0, \quad \bar{q}_0 = \frac{1}{n} \sum_{i=1}^n q_i, \quad s_0 = \sqrt{\frac{1}{n} \sum_{i=1}^n (q_i - \bar{q}_0)^2}.$$

where:

Hellwig's synthetic measure of development S_i typically takes values from the range of (0.1). The closer the values thereof are to 1, the higher is the level of maintenance of particular componential orders (social, environmental-and-spatial, and economic) of the object under study.

Performance of the linear ordering of objects under study (rural communes) and the determination of typological classes for socio-economic development and environmental order using an arithmetic mean and standard deviation in according with the following procedure:

$s_i > \bar{s}_i + s_{s_i}$ - Class I - a higher level of socio-economic development, environmental order;

$\bar{s}_i - s_{s_i} < s_i \leq \bar{s}_i + s_{s_i}$ - Class II - an average level of socio-economic development, environmental order;

considerations, it should be noted that the "development pattern" is a hypothetic rural commune with the most favourable values of variables.

$$q_i = \sqrt{\sum_{j=1}^m (z_{ij} - z_{0j})^2}. \quad (4)$$

The next step was the determination of Euclidean distances for each object P_i under evaluation (rural commune) from the determined "development pattern".

Based on the determined values q_i, a value of Hellwig's synthetic measure of development was calculated, which was used to evaluate the rural communes under study. The indicator value may be presented according to the following formula:

$s_i \leq \bar{s}_i - s_{s_i}$, - Class III - a lower level of socio-economic development, environmental order;

where:

S_i - value of the synthetic measure calculated using the Hellwig's method for: socio-economic development; environmental order,

\bar{s}_i - arithmetic mean of synthetic measure S_i,

s_{s_i} - standard deviation of synthetic measure S_i.

Then, based on specific classes, sustainability coefficients (indicator of sustainable development) were determined in accordance with the following procedure:

$$ISD = \frac{KRSG}{KLS}, \quad (6)$$

where:

ISD – indicator of sustainable development (intensity indicator – a relative value expressing the formation of the value of a phenomenon against the background of another one being logically linked with it);

KRSG – class of socio-economic development;

KLS – class of environmental order.

when:

ISD = 1 – sustainable development – the balance occurs between the class of socio-economic development and the class of environmental order;

ISD < 1 – protective (passive) development – focused on environmental protection, the class of socio-economic development is lower than the class of environmental order;

ISD > 1 – expansive (aggressive) development – focused on economic expansion, the class of socio-economic development surpasses the class of environmental order.

Research results and discussion

Analysis of the data showed that units characterised by average development (Class II) in terms of socio-economic aspects and environmental order predominate in rural communes in Eastern Poland (Table 1). In 2007, there were 380 of analysed communes in the first case and 394 in the second, out of the total 496. In turn, in 2013 an increase by just under one unit took place for socio-economic factors, and an increase by nearly 7 % (31 communes) for indicators for environmental order. This is affected by the fact that, on the one hand, there are many areas with favourable natural assets, a relatively small area of degraded soils, and a typical rural landscape (Pawlewicz A., Pawlewicz K., 2012). On the other hand, this is a result of the adaptation to the standards in force in the EU Member States, which is necessary for the implementation of pro-environmental projects (Mazur-Wierzbicka E., 2015).

In 2007, there were 66 units with a higher level (Class I) of socio-economic development, and 42 units with a higher level of environmental order. As regards this typological class, it may be noted that units characterised by a high level of socio-economic development failed to maintain durability as in 2013, a decrease by nearly 1% was noted. In turn, environmental order was durable as there had been no change to the number of communes characterised by a high level of sustainable development.

In turn, in Class III, i.e. the class of units characterised by a low level of development, bilateral changes occurred during the analysis. On the one hand, the number of communes characterised by a low level of socio-economic development increased from 50 in 2007 to 52 in 2013. On the other hand, the number of territorial units characterised by a low level of environmental order decreased very significantly: in 2007, there were 60 of them, while in 2013, only 29. Therefore, one can notice a positive trend indicating an improvement to the quality of life but mainly in terms of environmental protection. Unfortunately, having analysed economic and social aspects, an increase may be observed in the number of communes in which economic downturn occurs, which results in their transfer to a lower class of development (details provided in Table 1).

Another studied phenomenon was the formation of the balance of socio-economic factors and environmental order, which are logically linked. According to results of the analysis conducted in 2007, 341 of 496 communes showed the balance between the class of socio-economic development and the class of environmental order, which indicates strong durability and stability of both factors. However, in 2013 there were 10 more of those communes. In turn, as regards economic expansion (**ISD** > 1), in 2007 there were 94 communes, while in 2013, a decrease to 72 territorial units (nearly 5% of the entire population under study)

was noted. A reverse situation occurred for communes focused on development based on environmental protection (ISD < 1): in 2007

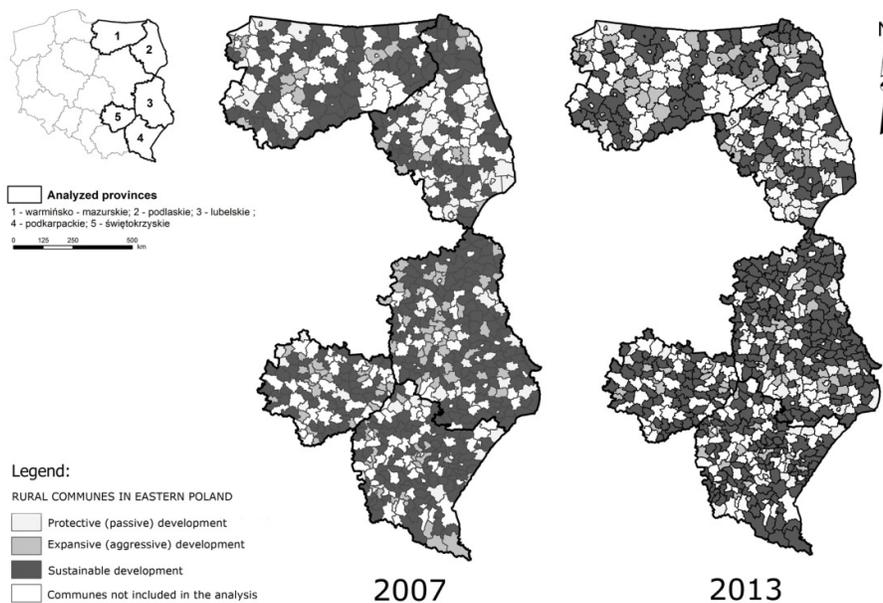
there were 61 communes, while in 2013 there were 73 of them, which is an increase by nearly 3 % (Table 1).

Table 1

Comparison of the number of communes according to the typological classes and sustainability indicator in the years 2007 and 2013

	2007		2013		2007/2013 (496=100%)	
The number of communes by classes						
	socio-economic development	environmental order	socio-economic development	environmental order	socio-economic development	environmental order
Class I	66	42	63	42	-0.64	0.00
Class II	380	394	381	425	0.21	6.61
Class III	50	60	52	29	0.43	-6.61
Total	496	496	496	496	-	-
The number of communes by ISD						
	ISD 2007		ISD 2013			
ISD = 1	341		351		2.13	
ISD > 1	94		72		-4.69	
ISD < 1	61		73		2.56	
Total	496		496		-	

Source: authors' construction based on GUS (Central Statistical Office) Bank of Local Data



Source: authors' construction based on GUS (Central Statistical Office) Bank of Local Data

Fig. 1. Spatial differentiation of the value of sustainability indicator in rural communes in Eastern Poland in the years 2007 and 2013

A positive trend can be observed: firstly, an increase in the number of units with socio-economic development balanced with environmental order as well as an increase in the number of communes which are focused on

environmental protection. However, in order to nevertheless achieve sustainability in the long term, communities should be more focused on economic activity, creating cooperation networks, and developing new economic activities allowing

the society to be entrepreneurial (Paula L., 2015). Secondly – a decrease in the number of units which are only focused on an economic expansion. It should be borne in mind that only integrated measures may contribute to the combination of socio-economic development with environmental protection (Lanfranchi M. et al., 2015).

Changes between the year 2007 and 2013 as regards spatial differentiation of the value of sustainability indicator are presented in Figure 1.

Conclusions, proposals, recommendations

The determination of the level of balance between economic-and-social factors and the condition of the environment is very important in analysing the degree of sustainable development. This is of significance because of the question: *"Is it possible to combine economic growth with the objective of sustainable development?"* Theoretically, a model of "sustainable development" (self-sustaining and durable, in which all three dimensions are maintained at a permanent equilibrium) is an ideal model, the implementation of which should be pursued through following a long-term policy of development. Knowledge of the relationships between the main components of the process under study may help implement lines of measures aimed at achieving the durability, and stimulate development in the future.

The proposed thesis was considered to be true, and its validity was demonstrated in the course of the study on the balance between the status of socio-economic development and environmental order as illustrated by the example of 496 communes in Eastern Poland. It was demonstrated that sustainable development, owing to its particular determinants, is an extremely sensitive process due to the fluctuation of indicators being representative for both phenomena. The following conclusions were drawn in the course of the study:

1) In rural communes in Eastern Poland, the predominant units are those characterised by average development in terms of socio-economic aspects and environmental order.

2) Most communes under study showed the balance between the class of socio-economic development and the class of environmental order. This indicates the durability and sustainability of development, which is a welcome trend from the perspective of the concept of sustainable development.

3) A relationship between socio-economic phenomena and environmental order is present in each of the communes under study. However, the method and effects of the implementation of sustainable development vary.

4) The studies being carried out provide a possibility for monitoring the status of and changes in the process of implementation of the concept of sustainable development.

5) Horizontal analysis of synthetic values constructed on the basis of representative indicators for the phenomena under study provides a clear answer to the question about the level of sustainable development, with account taken of particular determinants of the area under study. Such research allows targeting self-government's measures as well as following the policy of both the state and the UE towards the strengthening of specific components of sustainable development. This may lead to the optimisation of living conditions while maintaining the intergenerational justice, which is the primary objective of the concept of sustainable development. This is of exceptional importance, particularly to the poorer regions where the pursuit of rapid economic development may frequently threaten the maintenance of a proper level and the protection of natural environment, leading to irreversible changes and permanently

threatening the idea of sustainable development.

Bibliography

1. Borys, T., (ed). (2005). *Wskazniki zrównowzonego rozwoju (Sustainable Development Indicators)*. Warszawa-Białystok. Ekonomia i Środowisko. p. 247.
2. Bossel, H. (1999). *Indicators for Sustainable Development: Theory, Method, Applications*. Winnipeg: International Institute for Sustainable Development. p. 138.
3. Borawski P., Dunn J.W. (2014). *Evaluation of Human Capital in Dairy Farm Owners According to the Level of Education*. in: Rural Development in Poland: the Role of Policy, Tourism and Human Capital. Edited by: Borawski, P; Brelik, A; Czyzewski, B., WSES Ostrołęka, pp 115-123.
4. Caschili, S., De Montis, A., Trogu, D. (2014). *Accessibility and Rurality Indicators for Regional Development. Computers, Environment and Urban Systems*. Volume 49. pp. 98-114.
5. Cieslak, I., Pawlewicz, K., Pawlewicz, A., Szuniewicz, K. 2015. *Impact of The Natura 2000 Network on Social-economic Development of Rural Communes in Poland*. Research for Rural Development 2015. Volume 2, pp. 169-175.
6. Gobattoni, F., Pelorosso, R., Leone, A., Ripa, M. N. (2015). Sustainable Rural Development: The Role of Traditional Activities in Central Italy. *Land Use Policy*, 48, pp. 412-427.
7. Hellwig, Z. (1968). Zastosowanie metody taksonomicznej do typologicznego podziału krajów ze względu na poziom ich rozwoju oraz zasoby i struktury wykwalifikowanych kadr (Procedure of Evaluating High Level Manpower Data and Typology of Countries by Means of the Taxonomic Method). *Przegląd statystyczny*, Vol. 15, I. 4, Warszawa: PWN, pp. 307-327.
8. Korol, J. (2007). Wskazniki zrównowzonego rozwoju w modelowaniu procesów regionalnych. (Sustainable Development Indicators in Modelling Regional Processes). Wyd. Adam Marszałek. p. 211.
9. Lanfranchi, M., Giannetto, C., De Pascale, A. (2015). *The Link between Economic Growth and Environmental Quality in the Case of Coastal Tourism in the Rural Areas*. Applied Mathematical Sciences, Volume 9 (35), pp. 1745-1755.
10. Livina, A., Rozentale, S. (2015). Nature as Indicator of Place Economic Sustainability. *Integrated and Sustainable Regional Development. Economic Science for Rural Development*, 38. pp. 92-102.
11. Mazur-Wierzbicka, E. (2015). Nakłady inwestycyjne w ochronie środowiska w Polsce (Investment Expenditures on Environmental Protection in Poland). *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*. Volume 395. pp. 252-262.
12. Paula, L. (2015). Capability of Communities as Precondition for Sustainability of Rural Areas. *Integrated and Sustainable Regional Development. Economic Science for Rural Development*, 38. pp. 103-112.
13. Pawlewicz, A., Cieslak, I., Pawlewicz, K., Szuniewicz, K., (2015). Natura 2000 Sites and Socio-economic Development of Rural Communes in Eastern Poland. *Integrated and Sustainable Regional Development. Economic Science for Rural Development*, 38. pp 14-23.
14. Pawlewicz, A., Pawlewicz, K. (2012). Nakłady inwestycyjne na ochronę środowiska obszarów wiejskich na przykładzie województwa warmińsko-mazurskiego (Investment Expenditures on Environmental Protection of Rural Areas Based on the Example of Warmia and Mazury). *Acta Scientiarum Polonorum. Administratio Locorum*, No 2(11), pp. 165-175.
15. Pawlewicz, K., (2015). Differences in Development Levels of Urban Gminas in the Warmińsko-Mazurskie Voivodship in View of the Main Components of Sustainable Development. *Bulletin of Geography. Socioeconomic Series*, No. 29, pp. 93-102.
16. Spangenberg, J. H., Pfahl, S., Deller, K. (1999). *Indicators for Institutional Sustainability*. In: Malkina-Pykh I. (Ed.) *Indices and Indicators of Sustainable Development: A System Approach*. Proceedings of the Second Biannual INDEX Conference, St. Petersburg, Oxford.
17. Valentin, A., Spangenberg, J. H. (2000). A Guide to Community Sustainability Indicators. *Environmental Impact Assessment Review*, 20(3), pp. 381-392.
18. Zurlini, G., Petrosillo, I., Jones, K. B., Zaccarelli, N. (2013). Highlighting Order and Disorder in Social-ecological Landscapes to Foster Adaptive Capacity and Sustainability. *Landscape Ecology*. 28 (6), pp. 1161-1173.

LOCAL GOVERNMENT AS A PUBLIC INSTITUTION SUPPORTING ORGANIC PRODUCTION IN THE OPINION OF THE PRODUCERS FROM NATURAL VALUABLE AREAS OF THE LUBLIN VOIVODESHIP (POLAND)

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Abstract. Undertaking organic farming is conditioned by carrying out a series of tasks related to, inter alia, the implementation of the new procedures, technologies. This means that for the proper functioning, building regional capacity in this aspect, it is necessary to have support of institutions and organizations. Agricultural production (including organic food production) in this regard needs support not only from the corporate market but state institutions as well, including local government units.

The aim of this paper is to estimate support for organic food production provided by local government units compared to other institutions and organizations. It has been verified whether the local government unit indicated by producers as the most crucial with reference to the support provided for organic producers would be Marshall's Office. Research material for the purpose of the following paper was collected from 43 households producing organic food in 30 communes out of the most valuable areas according to the rate formulated by D. Guzal-Dec as part of studying the ecological value of rural and urban-rural communes of Lublin voivodeship. The research was conducted by means of a diagnostic survey with the use of a questionnaire.

Key words: organic production, valuable natural areas, local government.

JEL code: Q12, Q57, H79

Introduction

Lublin region is a region with a typically agricultural character. Located in the Eastern part of Poland, bordered in the South with Carpathian voivodeship, in the North with Podlaskie voivodeship and, in the West, with Mazovia as well as Swietokrzyskie voivodeships. The Eastern border of Lublin voivodeship is also one of Polish borders and the border of the European Union – a border with Belarus and Ukraine. Lublin voivodeship is the third largest area, just following Mazovia and Greater Poland voivodeships in the country (area 25122 km²).

Lublin voivodeship is one of the least developed voivodships. It is also a region characterized by fragmented agricultural structure. According to the 2010 General Agricultural Census, in Lublin voivodeship, there were 233559 farms engaged in agricultural activities, 233372 of which were private farms, and 66 public sector entities. Agricultural production area amounting to 1359882 ha in 2010 was used by 233372 individual farms engaged in agricultural activities. This area covers 54.1 % of the total area of Lublin voivodeship in 2010. Due to environmental benefits Lublin voivodeship is an area where

ecological agriculture should develop. It is the farming that creates conditions for the exploitation of natural resources providing permanent soil fertility and animal and plant healthiness, such production is based on using natural means of production (Wojcik G., 2012).

Number of organic producers operating in the field of ecological agricultural production Poland, as of 31 December 2013, amounted to 26598. In Lublin voivodeship, there were 2129, representing 8% of those carrying out this type of activity in the country. Another group of entities in the organic sector are enterprises engaged in the processing of organic products and the production of feed and / or yeast. Overall, the number in Poland, as of 31 December 2013, amounted to 407 (in Lublin voivodeship 45) (Agricultural and Food Quality Inspection, 2014).

First changes in the system of public administration in Poland took place in 1990, when the system of public services management changed at the commune level. This was the year of the start of independent local government (Act of 8 March 1990). Another important step in carrying out the reform of local government took place in 1999, when, under the Act on Local

government, full decentralization and the creation of two new types of local government (district and provincial government) took place (Act, 2014). The implementation of the reform was associated with conducting basic territorial division of the state.

Currently, in Poland, there is a three-tier territorial division. As of January 1, 2014, Poland was divided into 16 voivodeships, 314 poviats, 66 towns with poviat rights, 2479 communes (including 305 urban, 1566 rural, 608 urban-rural), 913 cities (including 608 cities in urban-rural communes). The local government reform, since the beginning of its operation, has aroused a number of emotions and discussions. Especially changes introduced on January 1, 1999, mainly related to decreasing the number of voivodeships (from 49 to 16 units at present) sparked a debate on a large scale. So far adjustments have been associated with local government. They relate particularly to the commune level.

Proper functioning of the public administration is associated with the execution of tasks by various local government units. The range of tasks performed by communes in accordance with the Local Government Act includes activities in the area of public affairs of local importance (not defined for other entities). Referring to commune activities associated with farming and organic food production, one should pay special attention to the following tasks involving: "spatial management, real estate, environmental and nature conservation and water management; promotion of the commune; cooperation and activities of non-governmental organizations and entities mentioned in Art. 3 paragraphs 3 of the Act of 24 April 2003 on Public Benefit and Volunteer Work (Journal of Laws of 2010, No 234, item 1536, as amended)" (Act, 2013a).

In the case of another unit of local government, activities include public tasks of the supra-commune level "water management, environmental protection and nature conservation, agriculture, forestry and inland

fisheries, promotion of poviats, cooperation and activities of non-governmental organizations and entities mentioned in Art. 3 paragraph 3 of the Act of 24 April 2003 on Public Benefit and Volunteer Work (Journal of Laws of 2010, No 234, item 1536, as amended)" (Act, 2013b).

Poviat is yet another unit constituting part of the system of local government. According to the Law on Local Governments, it is an entity that defines the strategy of development of the region taking into account the number of objectives, among others: "stimulating economic activity, raising the level of competitiveness and innovation of the region; preserving the cultural and natural environment values, taking into account the needs of future generations; rational use of natural resources and shaping the environment, in accordance with the principle of sustainable development; promotion of values and opportunities for regional development" (Act, 2013c). Other tasks performed by the regional government include modernization of the countryside and the environment (Act, 2013c).

Analyzing individual tasks of all of the elements of local government in relation to the promotion of organic production, it can be observed that there is no such a clear reflection in legislation. In the case of the unit being near farms – commune – the tasks are very vague, cannot concentrate mainly on issues of promotion and possible co-operation with NGOs, which are important in the case of organic producers. Paying attention to the problems of agricultural production is much wider in the case of the tasks assigned to poviats and voivodeship governments. Environmental protection is equally important in all of the case it has been highlighted in the mentioned tasks. Tasks imposed by legislation on voivodeship government indicate the need for modernization of rural areas, and the rational use of natural resources. Organic production carried out on farms is included in the implementation of these tasks by voivodeship governments.

Analyzing the role of local government in supporting organic production, it should be noted that this production is supported both from the national budget and the European Union under the Rural Development Plan (2004-2006), the Rural Development Programme (2007-2013). Institutions at the voivodeship level proved to be significant for the implementation of the aforementioned programmes. Therefore, the main purpose of the paper is to identify how farmers evaluate the support in organic production provided by local government units. Due to the fact that main institutions implementing national plans and programs are voivodeship institutions, the hypothesis has been made that support given by Marshall's Office would obtain the highest ratings from respondents in comparison to other local government units.

Methodology

The overall study area included 40 rural and urban-rural communes of Lublin voivodeship (about 20 % of all municipalities), including 30 of the group of the greater natural value and 10 municipalities of a comparative group of communes with low natural value according to the index developed by D. Guzal-Dec in the study of natural value of rural and urban-rural commune of the Lublin voivodeship (Guzal-Dec D., 2013). The natural valuable communes include: Janow Podlaski, Konstantynow, Jozefow, Lukow, Obsza, Dzwola, Janow Lubelski, Modliborzyce, Janowiec, Kazimierz Dolny, Wawolnica, Krasniczyn, Wilkow, Debowa Kloda, Sosnowica, Stezyca, Lubycza Krolewska, Susiec, Tarnawatka, Tomaszow Lubelski, Rossosz, Slawatycze, Urszulin, Wlodawa, Adamow (zamojski), Krasnobrod, Labunie, Skierbieszow, Stary Zamosc, Zwierzyniec. Comparative communes include: Biala Podlaska, Radzyn Podlaski, Komarowka Podlaska, Tyszowce, Wohyn, Turobin, Kamionka, Niemce, Ryki, Fajslawice.

In the area of research, 200 interviews were carried out, including: 30 large farms with an area of more than 50 ha, 60 conventional farms with an area of over 5 ha, 50 agritourist farms, 60 farms engaged in organic production. Forty-two research studies have been conducted as part of ecological farms from natural valuable areas (30) by means of a diagnostic poll method with the use of a questionnaire

Research results and discussion

The studied farms, practicing organic production, from the area of natural valuable sites of Lublin voivodeship are entities with an average area of 23.48 ha (standard deviation 28.6). Three quarters of them focuses on crop production.

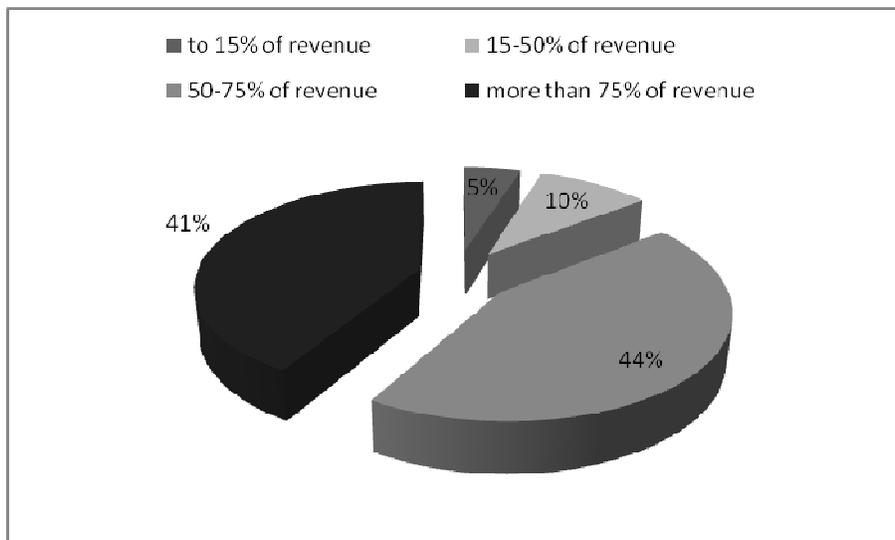
Implementation of agricultural production is associated with making and execution of plans, both short and long-term plans oriented development activities or changes in their profiles. Among the 42 studied farms, pursuing organic production, only one farm owner is considering to cease organic production in the next three years. The vast majority of the surveyed producers consider increasing organic production (15 %), increasing the current level of organic production and introduction of new types of crops (22.5 %), increasing the current level of organic production, while reducing the number of crops (10 %).

The interest in this type of activity in farming in recent years in rural areas in Poland is unabated. What is more, producers who undertake it, try to pursue this type of production gradually. This is due, inter alia, to the level of income derived from such a production. Over 40 % of organic producers pointed that income from this type of production was more than 75 % of household income. An equally important group includes farms in respect of which income from organic production accounts to 50-75 %. Only 15% of subjects included in the study group receives income from the production of organic

food amounting to less than half of total household income.

It is worth noting that almost 30% of the income from the production of organic food represented the total amount of their income in

the household. Economic factor is one of the motives for undertaking organic production, both on microeconomic (regarding individual households) and macroeconomic (as regards national economy) levels (Ciburienne J., 2014).



Source: author's construction

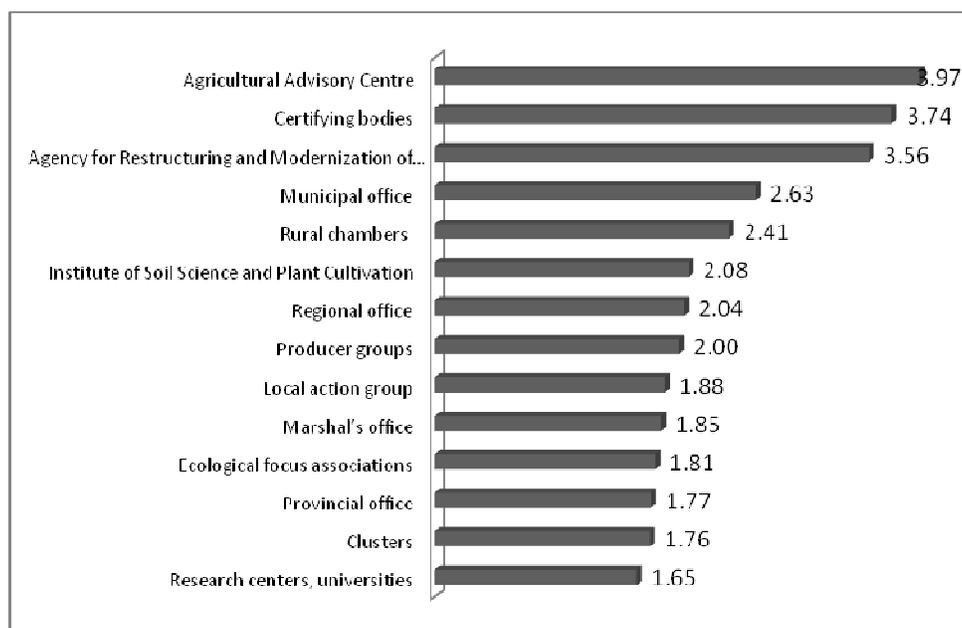
Fig.1. Share of income from organic production in total farm income

A significant portion of the income of the producers of organic food comes from subsidies. Over 80 % of respondents claimed that these amounts were not sufficient, and the level of their income allowed for continued production.

The level of income earned is determined by the level of prices for organic products, which, in the opinion of 77 % of the surveyed producers, should be higher. Whatever way you look at the level of income achieved, an important factor to improve the income of almost 40 % farms producing organic food in the study group was to

change their production profile. Heads of these households pointed that the level of income after the transition from traditional to organic production had increased.

In order to assess the received support, respondents evaluated support from a number of institutions and organizations in the implementation of organic production. The strength of the impact was evaluated on a scale from 1 to 5, where 1 meant the lowest level of support and 5 - the highest level of support.



* rating scale of 1 to 5, wherein the lowest level of support is 1 and 5 is the highest level

Source: author's construction

Fig.2. **Average for the evaluation of support of selected institutions and organizations in the implementation of organic production***

Among all of the tested institutions, respondents rated support by Agricultural Advisory Centres the highest (mean 3.97, standard deviation 1.25), followed by certifying bodies (mean 3.74, SD 1.26) and the Agency for Restructuring and Modernization of Agriculture (mean 3.56; standard deviation 1.42).

Agricultural Advisory Centres are part of the Farm Advisory System (FAS - Farm Advisory System). They are institutions of self-government, they run broadly understood advisory services for both farmers and agricultural entrepreneurs. In Poland, there are 16 AACs, they are subject to Local Government Provincial. Agricultural Advisory Centres implement a number of measures to support both organic production as well as the activities of all agricultural producers (Firlej K., Rydz A., 2012). Producers participating in the study indicated mainly: consulting, training, workshops, assistance in filling in documentation, organization of fairs, festivals and information activities as forms of support to be implemented by entities.

Certification bodies are one of the components of a system of certification and control of "C"

organic products. This system is applicable in four EU countries. In Poland, it consists of the following entities (Ministry of Agriculture and Rural Development, 2011):

- certifying bodies
- the Minister of Agriculture and Rural Development
- the Quality Inspection of Agricultural and Food (IJHARS)
- certification bodies.

Based on the decision of the Minister for Agriculture and Rural Development, ten bodies are authorized to carry out inspections and issue and revoke certificates of compliance for organic farming (Ministry of Agriculture and Rural Development, 2014). Majority of respondents (94 %) indicated a certificate obtained at Ekogwarancja PTRE Ltd., Warsaw. Among the actions that certification bodies implemented the respondents indicated mainly organization of training courses, seminars, advisory control and information activities.

The third unit highly rated by the test group of agricultural producers was the Agency for Restructuring and Modernization of Agriculture.

The Agency was created in 1994. In order to promote the development of agriculture and rural areas. It is the entity responsible for the implementation of direct payments, among other things, the Rural Development Programme 2007-2013. The ARMA also continues the implementation of the assistance from national funds in the form of subsidies to the interest on investment loans.

Assessing the support of local government units in the opinion of the respondents, it should be noted that out of the four respondents (Municipal Office, Office of the Poviát, the Marshall's Office, Provincial Office) support by the municipal office was rated the highest. Average rating of the Municipal Office support in the implementation of organic production among the surveyed producers was at 2.63 (standard deviation 1.18). Support of the Regional Office and the Marshall's Office was rated much lower. Average rating ranged respectively at the level of 1.85 and 1.65 (standard deviation: 1.02, 0.95). Among the activities undertaken by Municipal Offices, respondents mentioned mainly: organization of festivals, fairs and promotional activities. In the case of actions taken by District Offices, educational activities related to the organization of seminars, training and information meetings had been highlighted. Related activities were perceived by respondents in relation to the activity of support granted by the Regional Office and the Marshall's Office. However, it should be noted that only a single respondent drew attention to the role of these institutions in terms of financial support in the form of subsidies and grants. Nevertheless, as indicated by the research conducted by Polish Academy of Sciences Institute of Rural and Agricultural Development, active local government units are an undeniable development potential for both organic production and rural areas in a broader context (Polish Academy of Sciences Institute of Rural and Agricultural Development, 2013). In the context of organic

production development, it is crucial to support producer groups and other forms of farmers' organized activity. The problematic aspects of organic production development should constitute the subject of analysis in many communes and include their developmental strategies. In this way, it might constitute the subject of a lot greater interest as regards implementing various actions undertaken on different levels of government.

Conclusions

Implementation of new solutions, even related to the modernization of agriculture and rural areas is a challenge for both farmers as well as the institutions that support these activities. Particularly large role is to be played by public institutions, which are, among others, representatives of local governments.

The results indicate low assessment of support from local government units in the implementation of organic production, which may be due to lack of action on this issue from their side. However, one should also consider this bad score regarding lack of knowledge on the actions taken by local governments. The latter aspect is especially pointed out by low awareness of respondents in the organization of the process associated with the payment of subsidies, financial assistance. The hypothesis made in the article has not been confirmed. Organic food producers evaluated the support of both Marshall's Office and Governor's Office as much worse than that provided by Communal Office and Poviát Office.

Respondents perceived a significant role of local government units in terms of marketing activities, especially promotion of the organization of various events which allow promoting organic production.

Any action taken by the local government as reflected in the opinions of respondents can be found in the tasks entrusted to them under the legislation. The farmers have not indicated other actions that would be the subject of local

government units activity going beyond the operations imposed on them. It does not mean that such operations are not being implemented

but it may signalize the lack of communication and flow of information between farmers and public institutions.

Bibliography

1. Act (2013a). *Ustawa z 8 marca 1990 r. o samorządzie terytorialnym*, Dz.U z 2013 r., nr 16, poz. 95 (Act of 8 March 1990 on the Local Government, Polish Journal of Laws Dz. U. of 2013, No. 16, item 95).
2. Act (2013b). *Ustawa z dnia 5 czerwca 1998 r. o samorządzie powiatowym*, Dz. U. z 2013r. poz. 595, 645 (Act of 5 June 1998 on the Powiat Government, Polish Journal of Laws Dz. U. of 2013, item 595, 645).
3. Act (2013c). *Ustawa z dnia 11 marca 2013 r. o samorządzie województwa*, Dz. U. z 2013 r. poz. 596 (Act of 11 March 2013 on the Voivodeship Government, Polish Journal of Laws Dz. U. of 2013, item 596).
4. Act (2014). *Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym*, Dz. U. z 2014 r., poz. 379, 1072 (Act of Act of 8 March 1990 on the Local Government, Polish Journal of Laws Dz. U. of 2014, item 379, 1072).
5. Agricultural and Food Quality Inspection (2014), *Statistical Information of Organic Food Producers (Informacja statystyczna o producentach żywności ekologicznej)*, Inspekcja Jakości Handlowej Artykułów Rolno-Spożywczych, Warszawa.
6. Ciburiene, J. (2014). *Organic Agriculture for Sustainable Rural Development: Lithuanian Case*. Economic Science for Rural Development No. 36, p. 56. Retrieved: <http://www.esaf.llu.lv/getfile.php?id=821>. Access: 10.12.2015.
7. Firlej, K., Rydz, A.(2012). *The System of Agricultural Advisory Services in Poland and its Exploitation in the Context of 114 PROW 2007–2013 Operation*. The volumes of Kujawy and Pomorze University in Bydgoszcz, No 2, p. 217.
8. Guzal-Dec, D. (2013). Operationalization of the Model Pressure-state-response Study of Ecological Valuables Rural Communities on the Example of the Province of Lublin: Annual Set the Environment Protection / Yearbook of Environmental Protection, Vol 15, No. 3, p. 2925-2941. Retrieved: <http://www.ijhar-s.gov.pl/pliki/A-pliki-z-glownego-katalogu/ethernet/2014/czerwiec/Tabela%201%20liczba%20producentow%202013.pdf> Access: 3.10.2014.
9. Ministry of Agriculture and Rural Development (2011), *Action Plan for Food and Organic Farming in Poland in 2011-2014*, Warsaw.
10. Ministry of Agriculture and Rural Development (2014). *Information about the Institutions of Certification (Informacja o konstytucjach certyfikujących)*, Ministerstwa Rolnictwa i Rozwoju Wsi, Warszawa. Retrieved: <https://bip.minrol.gov.pl/Informacje-Branzowe/Produkcja-Roslinna/Rolnictwo-Ekologiczne/Jednostki-Certyfikujace>. Access: 12.06.2014.
11. Polish Academy of Sciences Institute of Rural and Agricultural Development (2013). *Ecological Farming as a Factor of Local Development– the Analysis of Selected Cases*, Warsaw. Retrieved: http://irwirpan.waw.pl/polski/IRWiR_PAN_raport_Rolnictwo_ekologiczne_czynnikami_rozwoju_lokalnego.pdf. Access: 10.12.2015.
12. Wojcik, G. (2012). The Importance of Organic Farming In Poland in the Context of Changes Planned for 2011-2014. *Zootechnical News*, No. 4, p. 109.

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DEVELOPMENT OF ORGANIC AGRICULTURE IN LATVIA

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Abstract. In recent years, "green" lifestyle is becoming more typical. Agriculture is one of the most important sectors which must be sustainable, because it provides basic human needs and can influence all society. Therefore, such concepts as green products, organic food etc. are becoming relevant. Organic agriculture is being practiced in many countries around the world. It is rapidly developed also in Europe in the past years. The aim of the research is to estimate the development of organic agriculture in Latvia. The research is based on literature review as well as secondary statistical data and comparative analysis. The author also compares the development of organic agriculture in Latvia with her own previous research. The results show that Latvia is in the top five countries for organic farming in Europe, the number of organic farms is very high: at the beginning of 2016 there are 3340 farms registered as organic in Latvia. Latvia's organic farms mostly have multi-branch production, and, it depends on the type of farming. It is necessary to develop production systems, which are more environment-friendly and use local resources more efficiently as well as are less dependent on artificial, industrial inputs.

Key words: organic, green, agriculture, farming, Latvia.

JEL code: Q1, Q01, Q13

Introduction

In today's globalised world, every sector of the economy needs to re-orient itself to meet the changing demand. The concept of sustainability, which originally referred to environmental consequences of human activities, has been widely discussed at the global and national levels in any economic sector. The rural sectors are not exceptions. Agriculture is one of the main sectors which should be sustainable, that is, economically profitable, socially responsible and environmentally oriented. Agriculture is a multi-functional sector which is closely related to the environment. It also provides basic human needs, and in many countries is an important source of national income, foreign trade and employment.

The aim of the research is to estimate the development of organic agriculture in Latvia.

In order to achieve the aim, the author has set up the following tasks: 1) to estimate historical development of organic agriculture in Latvia and its structure; 2) to analyse the current situation of organic agriculture in Latvia.

Research methodology is based on literature review as well as secondary statistical data and comparative analysis. The general logical methods of deduction and induction are used. The analysis is also based on summary of the

results of earlier studies held by author in 2009 and 2013 (Tambovceva, Geipele, 2009; Tambovceva, Tambovcevs, 2013).

The main sources are the official records and reports of EUROSTAT (Statistical Office of the European Commission), IFOAM (International Federation of Organic Agriculture Movements), the Ministry of Agriculture of Latvia (MA), Agriculture Data Service (ADS), Food and Veterinary Service (FVS) and Farm Accountancy Data Network (FADN).

Research results and discussion

1. Sustainability and sustainable agriculture

Sustainability concept has been popular worldwide over recent years and nowadays it's used for almost every activity in human life. A comprehensive definition of sustainability as the attempt to balance economic, social, and environmental goals may be as follows: "*improving the quality of human life while living within the carrying capacity of the supporting ecosystem*".

The concept of sustainability, which originally referred to environmental consequences of human activities, has been widely discussed not only at the national but at the global level as well as in particular economic sectors. Agriculture is one of the main sectors which many believe should be sustainable, that is, ecologically sound,

economically viable, and socially responsible. This is so because agriculture provides basic human needs, and in most developing countries it is an important source of national income, foreign trade and employment. Agriculture is also a multi-functional sector which is closely related to the environment. Agriculture is one of the biggest environmental polluters and destroyers. Agricultural production systems pollute soil and water with agro-chemicals, reduce biodiversity, lead to degradation, desertification, erosion of soils and, in many cases result in poorly structured, monotonic agricultural landscapes.

According to the Sustainable Development Strategy of Latvia until 2030: "*Sustainable use of the natural capital may promote the forming of the image of Latvia as green country. It is the possibility to promote the development of export and many sectors of economy and creative activity, for example, in the service industry – environmentally-friendly tourism, leisure, recreation and medical treatment, health oriented catering services; in agriculture – biological agriculture and aquaculture...*" (Sustainable Development Strategy of Latvia until 2030, 2010).

Based on European Commission¹ "*Organic agriculture is an agricultural system that seeks to provide consumers with fresh, tasty and authentic food while respecting natural life-cycle systems*". It means that organic agriculture is a production system that sustains the health of soils, ecosystems and people.

Organic farming is a method of production which places the highest emphasis on environmental protection and, with regard to livestock production, on animal welfare considerations. It avoids or largely reduces the use of synthetic chemical inputs such as fertilisers, pesticides, additives and medicinal products. The production of genetically modified organisms (GMOs) and their use in animal feed is

forbidden. Based on the Eurostat²: "*organic farming differs from other agricultural production methods in the application of regulated standards (production rule), compulsory control schemes and a specific labelling scheme*".

The International Federation of Organic Agriculture Movements (IFOAM)³ presents its own definition of organic agriculture: "*Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved*".

The objectives of organic farming are the following:

- to ensure sustainable production of high-quality healthy food (instead of concentrating on maximizing yield), while maintaining crop and livestock diversity and preserving the environment (including plants, animals, soil, water and air);
- to ensure the fulfilment of requirements for livestock welfare (providing the animals with access to daylight, air, clean water, natural pastures and sufficient space etc.);
- to use direct solar energy more efficiently and, as much as possible, to reduce the use of fossil energy.

To achieve this, organic agriculture relies on a number of objectives and principles as well as common practices designed to minimise the human impact on the environment, while ensuring the agricultural system operates as naturally as possible. Sustainable development in agriculture is based on 4 principles IFOAM (http://www.ifoam.bio/sites/default/files/poa_en

¹ http://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/index_en.htm

² <http://ec.europa.eu/eurostat/web/agriculture/organic-farming>

³ <http://www.ifoam.bio/en/organic-landmarks/definition-organic-agriculture>

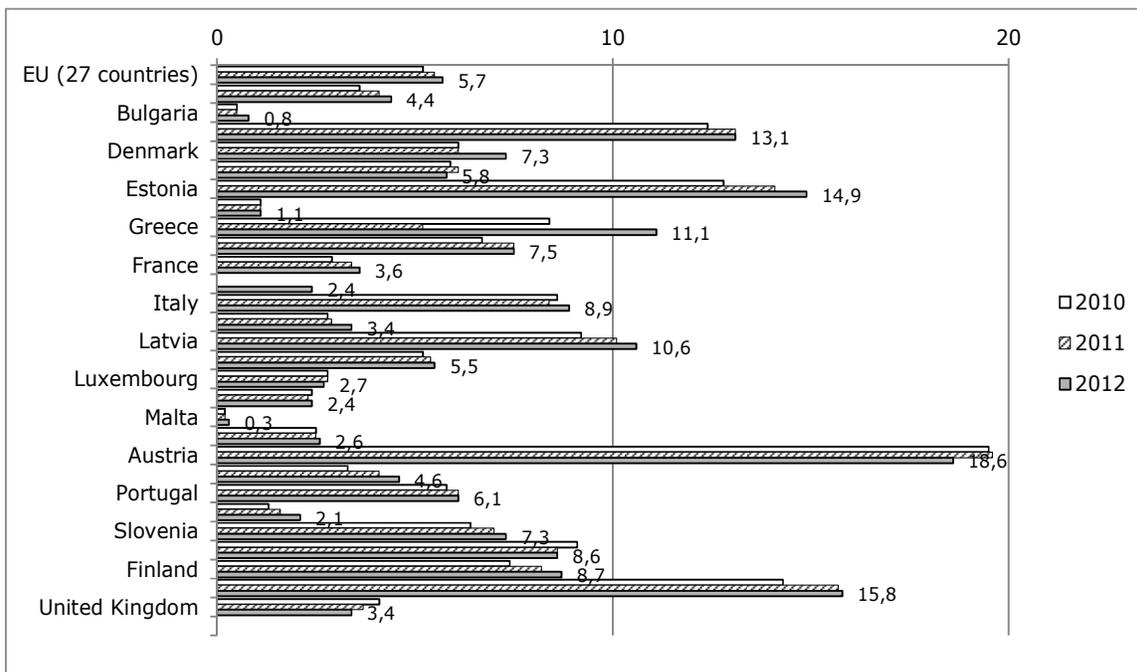
glish_web.pdf): 1) the principle of health; 2) the principle of ecology; 3) the principle of fairness, and 4) the principle of care.

Typical organic agriculture practices include (European Commission http://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/index_en.htm):

- wide crop rotation as a prerequisite for an efficient use of on-site resources;
- very strict limits on chemical synthetic pesticide and synthetic fertiliser use, livestock antibiotics, food additives and processing aids and other inputs;
- absolute prohibition of the use of genetically modified organisms;

- taking advantage of on-site resources, such as livestock manure for fertiliser or feed produced on the farm;
- raising livestock in free-range, open-air systems and providing them with organic feed;
- choosing plant and animal species that are resistant to disease and adapted to local conditions;
- using animal husbandry practices appropriate to different livestock species.

Organic agriculture is practicing in many countries around the world. It is rapidly developed also in Europe in the past years. Figure 1 shows the area under organic farming in Europe.



Source: author's construction based on the Eurostat (<http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsdpc440>)

Fig. 1. Area under organic farming in Europe, %

Sustainable agriculture is investigated by many reports (Shaller, 1993; Gafsi et al., 2006; Lockeretz, 2007; European Commission, 2014). Much knowledge has been acquired concerning the processes involved in the conversion from conventional to organic agriculture in various regions of the world. Condition and prospects of development of organic farming in the European

Union have been described by Pawlewicz (2014). He forecasts that the area under organic crops in the European Union may increase to as much as 14 million ha by the year 2020. The characteristics of organic farming, their application and perspectives in Lithuania have been analysed by Ciburiene (2014). Dunn, Borawski, and Pawlewicz (2014) present the state

of organic farming development in the USA and evaluate the organic food market development and exports in the USA. Karasova (2014) gives an overview of organic production as an innovative trend in export-oriented development of Ukraine's agriculture. Jahroh (2010) declares that organic farming is based on special regulations, standardization and certification, which is designed to support the quality and management of organic production. Kucinska et al. (2008) conclude that organic farming can be an opportunity for smaller farms with poor soils and challenging economic conditions. A sustainable farm must achieve both economic and environmental goals without losing sight of social aspects (such as family quality of life, human health, relationships with community, farmer's education and skills etc.) (Den Biggelaar and Suvedi, 2000). Nikolova (2013) describes challenges to organic agriculture in Bulgaria. Daniloska (2014) developed the model of knowledge system for organic agriculture in the Republic of Macedonia. Dantsis, Loumou, and Giourga (2009) provide a case study of organic farming in Greece.

Organic farming sector is growing. Overall positive trends in organic farming are (State Ltd "Certifying and Testing Centre", 2015a):

- increasingly growing consumers' demand gives farmers a lot of new opportunities;
- being organic farmers, the producers receive a certificate and obtain the right to market their products under the label "organic";
- healthy and natural product enters the market increasing the competitiveness of producers;
- the market price for organic products is higher because the consumer is willing to pay more for high quality food, animal welfare and environmental protection;
- it is possible to get annual state aid for organic products.

Development of organic agriculture in Latvia

Latvia is predominantly rural country and has a rich history in agriculture. Latvia occupies a

territory of 64 589 km², of which the inland waters take up 2543 km² and dry land 62 046 km², including agricultural land 24 710 km² (around 39%) and forest 29 503 km² (more than 54 %), 32.3 % of Latvian population lives in rural areas.

Before the beginning of World War II, Latvian farms were in private hands. During the Soviet times the small individual farms were replaced by the much larger state or collective farms. By the end of the 1950s, the consolidation of independent homesteads was almost complete, with over 90 % of the farms turning into the "kolhozs" (James, 2009).

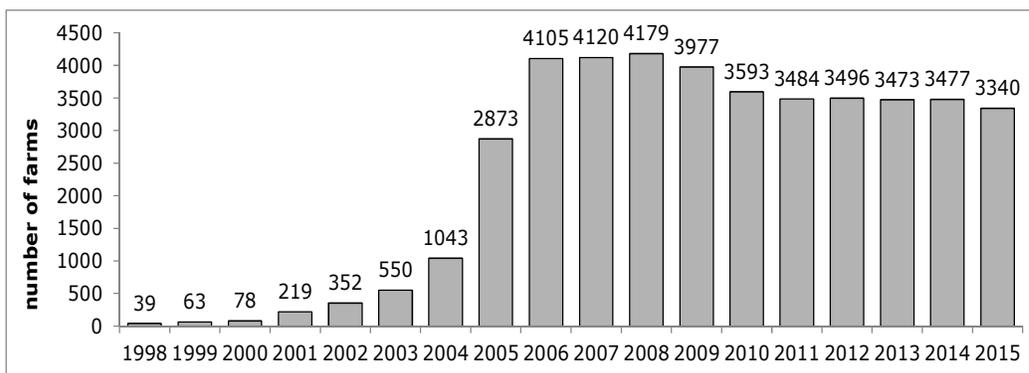
The development of organic agriculture in Latvia started in 1990 from three registered organic farms and rapidly grew after 2001. Growth has been triggered by two activities: 1) the implementation of an inspection system according to the EU Regulation No 2092/91 in 2001; 2) the implementation of an action plan in the country in 2003 that stimulated farmers' interest in converting to the organic system. Local organic farming organizations cooperated and established an association in 1995. In 2003, the government accepted the Organic Farming Development Programme. Then, the Latvian Organic Farming Organisation joined the International Federation of Organic Agriculture Movements (IFOAM). After Latvia's accession to the EU in 2004, the number of organic farms has increased more than four times (Melece, Praulins and Popluga, 2009).

Nowadays, agriculture is one of the most important economic sectors in Latvia, because the agricultural land occupies around 39% of Latvia's territory. Agriculture, forestry and fishery sector employed 66.3 thousands people in 2014, it is by 7.8% less than in 2013. Employment in the plant, livestock and hunting decreased by 4.3 thousand people (46.4 thou.), or 8.5%, and together make up 5.2% of the country's employment (Ministry of Agriculture, 2015).

Agricultural sector is a place of life and work for a large part of society, which produces food and raw materials and has always been one of the important sectors in Latvia's economy. It constitutes 1.7% of the Gross Domestic Product (EUR 235.8 million in 2014) on average.

The European Union (EU) demand for organically grown and produced food is growing steadily, therefore the organic farming sector and the market is developing. According to the European Commission (2013) information the top 5 countries for organic farming are: Austria -

19%, Sweden - 15.7%, Estonia - 14%, Czech Republic- 13%, and Latvia - 10%. The number of organic producers worldwide as well as in Europe has sharply increased in the last decade. At the end of 2014, the number of organic farms in Latvia reached 3477, which is a slight increase, compared to the previous year but in general during the last five years the number of certified organic farms is stable. Total number of organic farms in Latvia in period from 1998 to 2015 is shown in Figure 2.



Source: author's construction based on: the Ministry of Agriculture, 2015; Agriculture Data Service, 2015; FVS, 2016

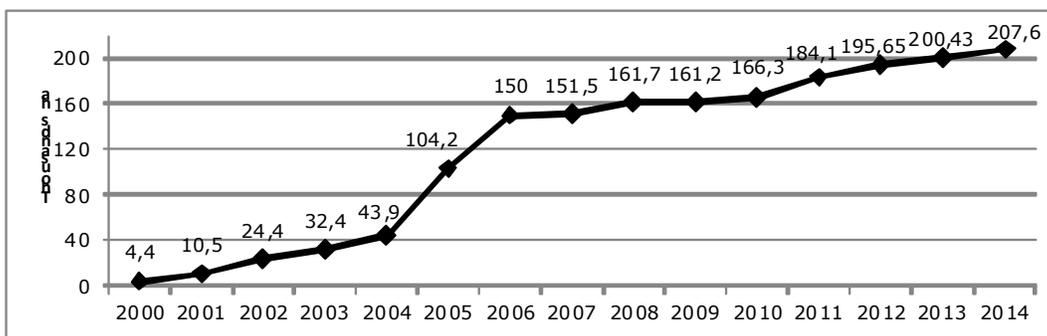
Fig. 2. Number of organic farms in Latvia

There were 3475 agricultural producers and 2 aquaculture animal breeders certified in 2014 in Latvia as well as 63 refineries, 6 importers, 1 exporter, and 60 other operators. Totally in 2014 there were 3607 certified organic operators in Latvia. At the beginning of 2016, there are two different values possible to find in the web pages. The Food and Veterinary Service (FVS) has 3183 organic farms registered in control bodies but the State Ltd „*Certifying and Testing Centre*” (2015b) database provides information about 3340 organic farms.

Despite the fact that the number of farms is large enough, however, these are small companies and their number is not sufficient. The

largest number of organic farms is located in districts of Daugavpils (179 farms), Madona (137 farms), and Gulbene (104 farms). Currently largest total amount of organic farms is in Latgale, i.e. 994 farms, which is almost 30 % (Agriculture Data Service, 2015).

Top 5 countries with the largest area for organic farming are: Spain - 1.8 million ha, Italy - 1.1 million ha, Germany - 1 million ha, France - 0.97 million ha, and the United Kingdom - 0.63 million ha. Together these countries account for 57 % of the total organic area of the European Union (European Commission, 2013). Figure 3 depicts organically certified agricultural land in Latvia for period from 2000 to 2014.



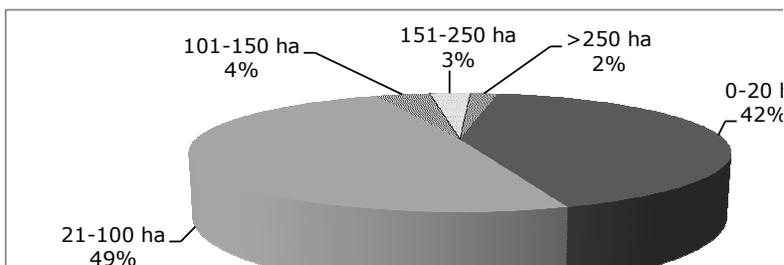
Source: author's construction based on the Ministry of Agriculture, 2015

Fig. 3. Organically certified agricultural land in Latvia, thousands ha

Organic farming sector is growing. Overall positive trend in organic farming is increasingly growing consumers' demand, which gives farmers a lot of new opportunities. Being organic farmers, the producers receive a certificate and obtain the right to market their products under the label "organic". As a result, healthy and natural product enters the market increasing the competitiveness of producers. The market price for organic products is higher because the

consumer is willing to pay more for qualitative food, animal welfare and environmental protection. It is possible to get annual state aid for organic products.

In Figure 4 the author collected information about the size of organic farms in Latvia. The results show that the vast majority (91 %) belongs to small farms with the total area not more than 100 hectares.



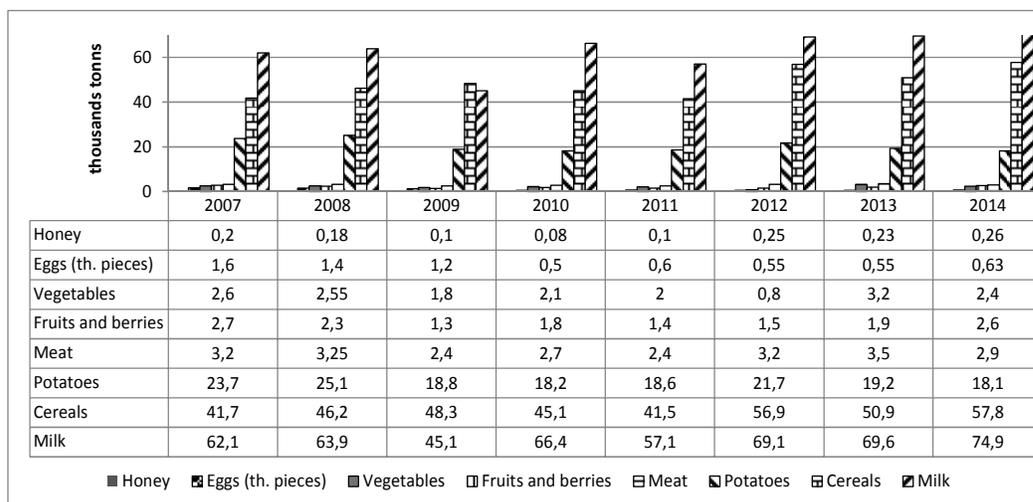
Source: author's construction based on the Ministry of Agriculture, 2015

Fig. 4. Size of organic farms in Latvia, ha

Organic production and labelling are subject to certification process. State Ltd „Certifying and Testing Centre" (2015a): assesses conformity of the enterprise in the following areas: crop cultivation, livestock breeding, beekeeping, rearing of aquaculture animals, wild animal breeding, mollusc growing, earthworm farming, product processing, fertilizer producing. The main production areas are crop production, including cereals and vegetables, and dairy farming.

Cereal farms specialize in rye and wheat for bread baking, while oats and barley are produced for fodder, thus, securing the domestic demand

for organic feedstuffs. Consumer demand is the highest for vegetables and fruit. The main crops are potatoes, onions, carrots and beet and, in terms of early vegetables from greenhouses, cucumbers, tomatoes and sweet peppers. In the past years, there has also been a strong increase in the demand for medicinal and aromatic plants. The main types of livestock are dairy cows, beef, pigs and poultry. Different types of honey, pollen and beeswax products are also popular. Figure 6 presents development of organic production in Latvia from 2007 to 2014.



Source: author's construction based on the Ministry of Agriculture, 2007- 2014

Fig. 6. Organic production in Latvia in period from 2007 to 2014

The import of all types of food and agricultural products increased year over year. A considerable part of the green products in Latvia is exported. The largest part of goods was exported and imported from/ to the European Union countries. The most important export partners for Latvia are Lithuania and Estonia, while Germany and Lithuania were the most important import partners.

During recent years, the popularity of food products produced in Latvia's organic farms has grown. The customers have also become more interested in visiting farms that offer an insight into organic farming and a unique opportunity to strengthen one's health and get some rest. *"Spend a weekend at the organic farm, feed animals, taste herbal teas, enjoy a bathhouse, learn to bake bread and do various other wonderful activities,"* encourages the Association of Latvian Organic Agriculture. Latvian farms are surrounded by picturesque scenery, encouraging guests to make use of the opportunity and observe wild animals and hike on the most beautiful forest trails.

Conclusions, proposals, recommendations

Organic agriculture is a model for rural development and it demonstrates with real-life

examples how to enhance economic, environmental and social sustainability at the regional, national, and global levels. The development of organic farming in Latvia is one of the priorities of the Ministry of Agriculture and it works on increasing the number of organic farmers, the cultivating land and the range of offered organic products.

The research results show that the growth rate of the GDP is approximately 2 % annually, while crop and animal production, hunting and related service activities remains at the same level.

During the last five years, there have been no significant changes in the number of organic farms in Latvia but area of organically certified agricultural land in Latvia slowly growing by approx. 5-6% annually.

The interest in organic farming in Latvia is growing all the time and it is based on the global increase of demand for such products as well as on the favourable market conditions. A considerable part of the green products is exported and is very well accepted on both the local and European market.

The development of organic agriculture in Latvia should be based on the government's focused effort in: improving the regulatory

framework and harmonizing it with international standards, subsidies for organic farmers, promoting the development of production and sales infrastructure for organic agriculture's products, shortening of food chains, any other

support for organic farming market participants. Changes for the whole farming system are necessary which show the multifunctional role of agriculture.

Bibliography

1. Agriculture Data Service. (2015). [Lauksaimniecības datu serviss]. Retrieved: http://pub.ldc.gov.lv/pub_bio.php. Access: 03.01.2016.
2. Area under Organic Farming. Eurostat. Retrieved: <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsdpc440>. Access: 06.01.2016
3. Ciburiene, J. (2014). Organic Agriculture for Sustainable Rural Development: Lithuanian Case. Economic Science for Rural Development. Jelgava, Latvia University of Agriculture, No. 36. pp. 51-57.
4. Daniloska, N. (2014). Model of Knowledge System for Organic Agriculture in the Republic of Macedonia. Economic Development, Volume 1, issue 2, pp. 49-65.
5. Dantsis, T., Loumou, A., Giourga, C. (2009). Organic Agriculture's Approach Towards Sustainability; Its Relationship with the Agro-Industrial Complex, A Case Study in Central Macedonia, Greece. Journal of Agriculture Environmental Ethics, Volume 22, pp. 197-216.
6. Definition of Organic Agriculture. *IFOAM Organics International*. Retrieved: <http://www.ifoam.bio/en/organic-landmarks/definition-organic-agriculture> Access: 26.12.2015
7. Den Biggelaar, C., Suvedi, M. (2000.) *Farmers' Definitions, Goals, and Bottlenecks of Sustainable Agriculture in the North-Ventral Region*. Agriculture and Human Values, Volume 17, issue 4, pp. 347-358.
8. Dunn, J.W., Bórawski, P., Pawlewic, A. (2014). *Development of Organic Farming in the USA*. *Oeconomia*, Volume 13, issue 3, pp. 55-68.
9. Food and Veterinary Service (FVS). (2016). *Kontroles institūcijas reģistrētie bioloģiskās lauksaimniecības uzņēmumi*. Retrieved: http://www.pvd.gov.lv/lat/lab_izvzne/registri/atzto_un_reistrto_uzmumu_sarak/kontroles_institucijas_reistrti Access: 07.01.2016
10. Gafsi, M., Legagneux, B., Nguyen, G., Robin, P. (2006). Toward Sustainable Farming Systems: *Effectiveness and Deficiency of the French Procedure of Sustainable Agriculture*. Agriculture Systems, Volume 90, pp.226-242.
11. Jahroh, S. (2010). Organic Farming Development in Indonesia: Lessons Learned from Organic Farming in West Java and North Sumatra. ISDA (Innovation and Sustainable Development in Agriculture and Food), Montpellier-France, June 28-30. Retrieved: www.isda2010.net Access: 13.11.2015.
12. James, O. (2009). *Latvian Farming's from Traditional Methods to Organic Incentives*. Retrieved: <http://www.baltictimes.com/news/articles/23574/>. Access: 05.01.2016
13. Karasova, N. (2014). *Organic Production as an Innovative Trend in Export-Oriented Development of Ukraine's Agriculture*. Management Theory and Studies for Rural Business and Infrastructure Development. Scientific Journal. Volume 36, issue 2. pp. 308-315.
14. Kucinska K., Pelc J., Golba J., Popławska A. (2008). The Prospects of Organic Agriculture Development in the Chosen Regions of Poland Podkarpacie and Kurpie. 16th IFOAM Organic World Congress, Modena, Italy, 16-20 June. Retrieved: <http://orgprints.org/11916/1/11916.pdf> Access 14.11.2015.
15. Lockeretz, W. (2007). *Organic Farming: an International History*. Wallingford: CABI. p.282
16. Ministry of Agriculture. (2015). [Zemkopības ministrija]. *Latvijas lauksaimniecība 2015*. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/63/66/LS_gadazinojums_2015.pdf Access: 27.12.2015
17. Melece, L., Praulins, A., Popluga, D. (2009). *Organic Farming in Latvia: Development and Economics*. *Zemes Ukio Mokslai*. Volume 16, issue 3-4, pp. 145-153
18. Nikolova, M. (2013.) Challenges to Organic Agriculture in Bulgaria. *Ekonomskie Teme*. Volume 51, issue 1, pp. 191-208.
19. *Organic Farming*. Eurostat. Retrieved: <http://ec.europa.eu/eurostat/web/agriculture/organic-farming>. Access: 16.12.2015
20. Pawlewicz, A. (2014). Importance of Horizontal Integration in Organic Farming. Economic Science for Rural Development. Jelgava, Latvia University of Agriculture, No. 34. 2014. pp. 112-120.
21. Principles of Organic Agriculture. *IFOAM Organics International*. Retrieved: http://www.ifoam.bio/sites/default/files/poa_english_web.pdf. Access: 26.12.2015
22. Shaller, N. (1993). *The Concept of Agricultural Sustainability*. Agriculture, Ecosystems and Environment. Volume, 46, pp. 89-97.
23. State Ltd „Certifying and Testing Centre”. (2015a). *Certification of organic agricultural enterprises*. Retrieved: <http://www.stc.lv/en/services/certification-of-organic-agricultural-enterprises/> Access: 16.12.2015
24. State Ltd „Certifying and Testing Centre”. (2015b). Issued certificates. Retrieved: <http://www.stc.lv/lv/pakalpojumi/biologiskas-lauksaimniecibas-uznemumu-sertifikacija/izsniegtie-sertifikati/> Access: 16.12.2015

25. *Sustainable Development Strategy of Latvia until 2030*, (2010). Retrieved:
http://www.cbs.nl/NR/rdonlyres/B7A5865F-0D1B-42AE-A838-FBA4CA31674D/0/Latvia_2010.pdf. Access:
16.12.2015
26. Tambovceva, T., Geipele, I. (2009). Sustainable Agriculture in Latvia. *Ekonomika ir vadyba: aktualijos ir perspektyvos*, Volume 2, issue 15, pp. 286–294.
27. Tambovceva T., Tambovcevs A. (2013). *Development of Organic Agriculture: Case of Latvia* // Recent Advances in Energy, Environment, Ecosystems and Development, Volume 12. Proceeding of the International Conference on Environment, Energy, Ecosystems and Development, EEED 2013, Greece, Rhodes, pp. 108-115.
28. *The EU Organic Farming (R)evolution. (2013)*. European Commission. Retrieved:
http://ec.europa.eu/agriculture/organic/images/infographics/organic-farming_en.pdf Access: 10.12.2015.
29. *What is Organic Farming. (2014)*. European Commission. Retrieved:
http://ec.europa.eu/agriculture/organic/organic-farming/what-is-organic-farming/index_en.htm Access:
03.01.2016.

SOCIO – RESPONSIBLE BEHAVIOR OF SMALL AND MEDIUM SIZED COMPANIES

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Abstract. Small and medium-sized enterprises (SMEs) have a strong impact on the economy of each country but their development depends on the general state of the national economy and also on the economic conjuncture in other European countries. But the entrepreneurial success depends also on the position of SMEs mainly in external environment, where the SMEs companies have dealt with own activities as well as how the SMEs have taken into account the CSR. The main goal of the submitted paper is to evaluate the socio – responsible behaviour of small and medium sized companies by using of selected information and methods of evaluation. This article contributes primary information from literature sources and secondary information from questionnaire research, which were processed by the statistical method called χ^2 test of square contingency and other methods.

The research also studied the customer understanding of CSR and revealed that people expect companies to act beyond their legal responsibilities and commonly imagine ethical behaviour, environmental protection and high quality of products and services among three most common characteristics of responsible behaviour of enterprises. The tasks of research have been confirmed on the main goal of the article.

In conclusion, we evaluated the results from the questionnaire in total and suggested recommendations for the oncoming small and medium sized enterpris 's business activity.

Key words: small and medium sized enterprises (SMEs), Corporate Social Responsibility, rural development

JEL code: M4, Q56, R58

Introduction

Small and medium-sized enterprises play a significant and essential role in all countries with a market economy. They also have extraordinary significance in the development of the Slovak economy, for creating new jobs and in regional development. However, small and medium-sized enterprises are to an increased extent sensitive to the quality of the business environment. The government's task is to continue improving the business environment and thereby generating the conditions for increasing their competitiveness in the domestic and international markets. The categorization of enterprises by size used in this chapter is in accordance with the European Commission Recommendation No 2003/361 EC, in force from 1 January 2005. The SME category is composed of businesses employing less than 250 employees, while enterprises with 250 employees or more are considered large. Among SMEs, a differentiation is made between micro-enterprises (0-9 employees), small enterprises (10-49 employees) and medium-sized enterprises (50-249 employees). In cases where micro-enterprises are not separately broken out,

all enterprises with 0-49 employees are classified as small enterprises. From this point of view, it is possible to state that the SMEs have played very important role in application Corporate Social Responsibility (CSR) in their activities and have the impact on their development in rural environment (Palkechova L. et al., 2014). It means that the Corporate Social Responsibility (CSR) is not new but nowadays it seems everyone is talking about it and organizations and businesses are being urged to protect the environment, save energy, and use ethical trading methods. The current concern that all businesses and the general public have for ethical behaviour and social responsibility is not restricted to the domestic situation. There are many authors who deal with the CSR in the expert 's or scientific articles. Although there was a huge debate about CSR during the 1950s, there was not a lot of action. Following Carroll (2008), business leaders were just learning how to get comfortable with this concept. Besides this, Carroll emphasizes the fact that in this period society could notice just few corporate actions other than philanthropy. What is most important for the period between the 1950s and the 1960s

is the fact, the social responsibility has moved from practice to academic field and became a theoretical concept (Gond, Moon, 2011).

Especially in Europe, where 99% of business companies are SMEs, the focus is devoted to more structured implementation of CSR concept into SMEs business strategies (Ubreziöva, A. and Horska, 2011). The same opinion is shared Mura and Buleca (2011) and Ubreziöva et al. (2013) or Gurska and Valova (2014). Concept of CSR plays an important role in this environment and presents a great opportunity for companies to become successful while also making world a better place. The corporate social responsibility of companies trying to enter new markets in relation to rural development and internationalize their production is a hot topic, nowadays. Decision makers are solving issues connected with the profit maximization, quality improvement, lowering costs, outsourcing, resources recovery, and satisfaction of stakeholders. Companies, operating on more than one markets, have to adapt their production processes and management to the requirements of the several markets. The European Commission's definition highlights the voluntary nature of this particular concept and the impact on the functioning of the company's stakeholders (European Commission, 2011). According Skypalova and Kucerova (2014), many small and medium sized enterprises in the Czech Republic have taken part in development of CSR concept and resulted in recommendations for the government in the form of concrete proposals on how the government could be involved in supporting the CSR concept with focus on SMEs. The basic recommendation is to formulate national documents (National Strategy and National Action Plan for CSR) as recommendations that will clearly identify the objectives and strategy of the Czech government in the CSR area. The state should primarily fulfil the informational role (dissemination of information among companies and other

stakeholders in the region via chambers of commerce and information sites), supportive role (individual assistance of the employees of the Ministry of Trade and Industry towards SMEs representatives) and educational role (to educate SMEs managers on CSR via e-learning and individual coaching).

This paper was created within the research project VEGA supported by the Ministry of Education, Science, Research and Sport of the Slovak Republic VEGA Corporate Social Responsibility (CSR) of the Slovak Enterprises in the context of Internationalization in Business. Project registration number 1/0044/13. The time of research was April 2014 till April 2015.

Since the thesis is focused on SMEs, the main stage of research will be based on a random sample of 100 companies in the Slovak Republic with respect to proportionate representation of every size – micro, small and medium sized companies. The data acquired from the questionnaire were statistically processed in Microsoft Excel and displayed by using both graphical and numerical means.

As a part of research, the following hypotheses in relation to the research in selected company were formulated:

- It is assumed that there is a relation between the knowledge of CSR concept and education level achieved.
- It is assumed that there is a relation between the preference of particular CSR aspect and gender of the respondent.
- It is assumed that there is a relation between the familiarity of selected company and age of the respondent.

As mentioned above, the primary data obtained from questionnaire survey and documents from the companies were processed by the use of mathematical and statistical methods. To graphically display research results, the authors used MS Excel and statistical processing SAS. The following methods and tests were applied:

- content and document analysis;
- methods of induction and deduction;
- methods of synthesis and analysis;

Chi square test.

To test if these dependencies are truthful, statistical method called χ^2 test of square contingency was used. This is a test for nominal data of two independent sets and is used to test hypotheses concerning the existence of dependencies between own questions and classifying variables. The authors used the formula by Obtulovic (2004):

$$\chi^2 = \sum_{i=1}^m \sum_{j=1}^n \frac{(E_{ij} - T_{ij})^2}{T_{ij}} \quad (1)$$

Where:

E_{ij} - empirical frequency

T_{ij} - theoretical frequency

m - Number of categories of the first character

n - Number of categories of the second character

The hypothesis general assumptions are following:

- H_0 : It assumes independence between studied characters.
- H_1 : It assumes dependence between studies characters.

Evaluation of the test is then as follows:

- If $P > \alpha \rightarrow H_0$ is accepted, between studied characters was demonstrated independence.
- If $P < \alpha \rightarrow H_0$ is rejected, the characters examined demonstrated dependence.

Results and discussion

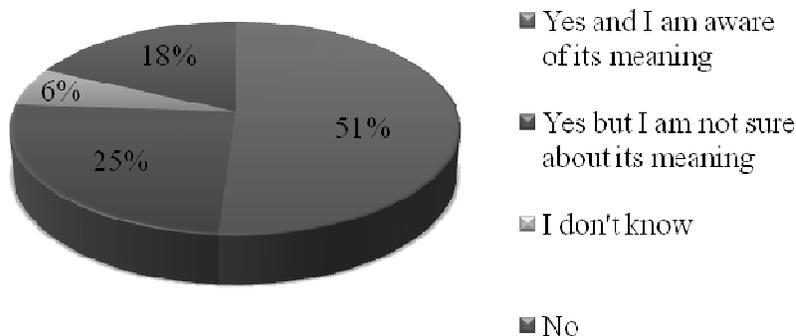
This paper deals with the topic which importance is increasing lately as many intense debates on the world forums are lead – Corporate Social Responsibility and its implication in the selected SMEs companies located in the

Slovak Republic. Since the 1990s, there has been a very big change in the relationship between business and society. When speaking about this change, several factors have contributed to it, such as globalization, deregulation, increased size of companies and many others. As a consequence of globalization, the whole world is more interdependent and multinational corporations have become the main drivers of this phenomenon as they support international trade, growth and development.

Generally, the basic aim of "classic" firm is achieving the biggest possible profit what is all right – it is the reason why the companies exist. However, doing the business responsibly is much more complicated and is described by the concept of the Corporate Social Responsibility (CSR). The basic difference between these approaches is that company applying CSR takes into consideration not only gaining the profit but also the way how it will be achieved.

Following question is oriented to find out if respondents SMEs are familiar with the term CSR and what do they understand under this concept. In recent years, the concept of corporate social responsibility received awareness and interest of companies and general public around the world.

When asked "Have you ever met with the term Corporate Social Responsibility?", 51 respondents claim that they are familiar with this term and know what the concept is about. Other 25 respondents have already come in touch with CSR but they are not sure about its significance. There are 6 respondents who do not know whether they have ever met with the term and 18 respondents are not familiar with the concept at all (Figure 1). The results are rather positive and it is possible to assume that socially responsible behaviour of the SMEs companies is attracting increasing attention of the public. With a view to the creation of new jobs and the improvement of rural development, it has an indispensable role in the economy of Slovakia (Machova, 2015).



Source: authors' construction based on results of the research.

Fig. 1. Have you ever met with term "Corporate social responsibility"?

Within this question, the first hypothesis were set. It was assumed that there is a relation between the knowledge of CSR concept and education level of respondents (Egerova, 2013). The following options were tested:

- H0: There is no relation between the knowledge of CSR concept and education level of respondents.
- H1: There is a relation between the knowledge of CSR concept and education level of respondents.

Table 1

Relation between the knowledge of CSR concept and education level

Outcomes	Chi table	Chi calculated
	16.9190	10.5576

Source: authors' calculations based on own research

Based on the outcome of the chi-square test of square contingency (Table 1), the authors do not reject the zero hypothesis which means that at the significance level of $\alpha = 0.05$ there is no relationship between the knowledge of CSR concept and achieved education level of the respondent. Next question offers more detailed information about what do respondents understand under corporate social responsibility. There were nine specific ideas of perceiving this concept and respondents could choose maximum of three answers. Out of total respondents, 67 think Ethical behaviour of an organization characterizes the concept of CSR best. Environmental protection was placed as second important activity of socially responsible enterprises with 54 respondents' choices,

followed by The quality and safety of products and services provided by a company which ended up with 40 respondents choosing it as one of the options. Then, 37 respondents understand under CSR Caring about company's employees as one of the relevant explanations, while 32 consider Community support as an area that should not be ignored by companies. A good relationship with business partners is understood by as CSR initiative by 20 respondents. Other 16 respondents of those asked think that Organizing charity and volunteering events is an important activity within the responsible behaviour followed by Globalization trend which is understood with 14 answers and Sponsorship and donations with only 8 respondents considering it a typical CSR activity as you can see in Figure 2.



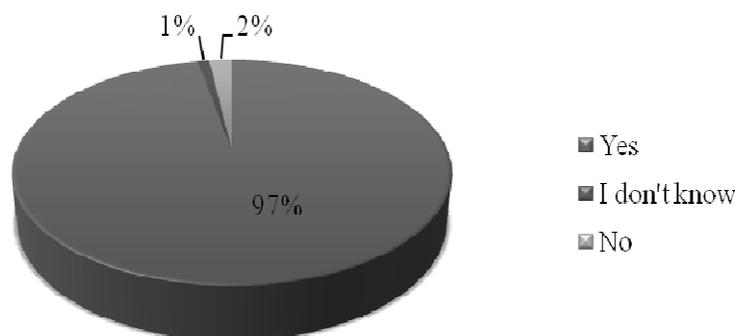
Source: authors' construction based on own research

Fig. 2. What do you understand under CSR?

Great example is Cadbury chocolate factory in the UK that has promoted today's CSR message "successful business in successful communities" already in 1890s. As the business prospered, Cadbury brothers decided to build a new factory, called Bournville that was different from every other. The vision of George Cadbury was to provide low-cost and quality living for their employees, and with his pretty huge passion for social reform, he decided for Bournville to be such place. The factory continued to grow up and after few years, it was managed scientifically and provided everything for its employees – analytical laboratories, medical department, education and training. They managed to set new standards for

working and living conditions. Therefore, Bournville became place known as the factory in the garden. (Jones 2013, Katsoulakos et al. 2004, Ella 2009)

The following question seeks to find out whether respondents think companies should involve CSR activities within their business and so become not only profit-oriented but also try to ensure the well-being of the community or environment around them. The results of this question are very obvious, 97% of respondents believe companies should behave responsibly towards society, 1% do not know and 2% find it unnecessary and consider profit maximization as the only focus of the company (Figure 3).



Source: authors' construction based on own processing

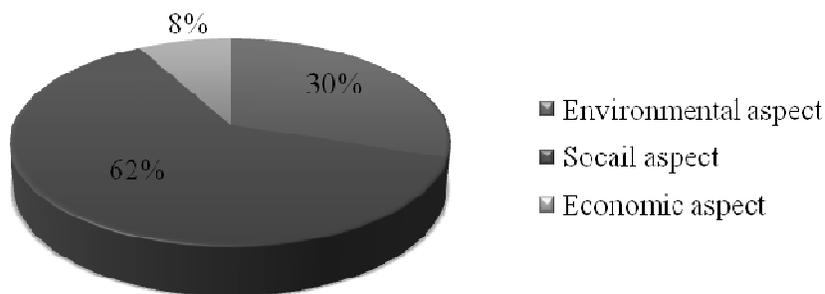
Fig. 3. Necessity of socially responsible behaviour of companies

By the following question, the authors wanted to find out which of the three CSR aspects do respondents prefer. Social aspect was chosen as

the most important with 62 respondents believing in its importance. Altogether, 30 respondents think Environmental aspect is the

most important of the three and only 8 people believe Economic aspect should come first before

environmental and social initiatives of a company (Figure 4).



Source: authors' construction based on own processing

Fig. 4: Importance of CSR aspects

In 1996, Slovakia was among the first countries all over the world that applied Environmental Management Systems (EMS). Certification was affirmed by certifying company from foreign country and confirms EMS according to ISO 14001. One year later, the first 11 products received the label Environmentally Friendly Product, sponsored by the Ministry of Environment. The national programme of environmental product evaluation and labelling was developed in 1996. When dealing with CSR in Slovakia, it is essential to mention the Foundation for a Civil Society Pontis established in 1997. They operate till nowadays as a Slovak branch of the American Foundation for a Civil Society. Their first contribution to the development of CSR in Slovakia was in 1998 when they introduced the award VIA BONA. It is the most prestigious award related to philanthropy and SR of companies and every year. Over the years, its significance is increasing and more and more companies are involved in this competition. The latest award was received in 2013, when 52 companies were nominated to win the award. In the year 1999, the Open Society Foundation conducted a survey regarding to cooperation of SMEs companies with non-profit sector as well as to the amount funds donated to non-profit projects in relation to rural development. In discussion with Fazekasova, M.

(2006) CSR is a very complex phenomenon which is difficult to define, but significantly influences the long term success of the company. On the one hand it can be a source of strength for an enterprise and its competitive advantage, on the other hand, a stranglehold of its development.

Conclusions, proposals, recommendations

1) SMEs that are socially responsible should demonstrate this "responsible approach" within the three pillars of society which are profit, people and planet. It is possible to state that the SMEs in sample, with the help of their complex CSR policies that includes environmental protection, sustainable business, support and development of employees, communities as well as the increased emphasis on the quality and safety of products being sold and cooperation with international organizations, are fully oriented on all three pillars. It is possible to say that CSR policies and activities of SMEs either in Slovak or in the international market have several common characteristics. Diversity of SMEs' CSR policy in international and Slovak market can be observed in the extent of the activities, the level of their effectiveness and impact of such activities on the rural environment.

2) It is possible to conclude that not only selected companies but every company that applies the corporate social behaviour to the rural development brings benefits in the end not only for society but definitely presents itself better in front of the customers and positively influence its corporate image. Based on the findings, the authors conclude that concept of CSR is becoming still more important and both people and companies are aware of this importance which opens the door for even greater application in the future. One can hope that companies worldwide will understand the advantages of responsible behaviour and will use this sustainable advantage in the long run. There is a strong connection between the responsible attitude and increasing profit and improving image and we hope this fact will assure us brighter and more sustainable rural development in the future.

3) When talking about connection between socio - responsible behaviour of SMEs and

entrepreneurship, we can propose the following recommendations:

4) to follow further entrepreneurial activities of small and medium sized enterprises in relation to the three main pillars of corporate social responsibility in their entrepreneurial activities,

5) continuous innovation and implementation of new environmentally friendly production methods and cooperation with environmental organisations for the knowledge transfer can contribute to the raise of an awareness about the good practises of the SMEs companies,

6) very important is to keep good relationships with regular customers and also attracting the new possible ones by implementation of innovative customer care and production in the selected set of SMEs,

7) to understand the reasons why to be socially responsible SMEs company and to apply the Corporate Social Responsibility and Behaviour in practice not only in the SMEs.

Bibliography

1. Carroll, A. (2008). *A History of Corporate Social Responsibility: Concepts and Practices*. In Crane, A., McWilliams, A., Matten, D., Moon, J. and Siegel, D. (eds), *The Oxford Handbook of Corporate Social Responsibility*. Oxford: Oxford University Press, pp. 19-46.
2. Egerova, D., Jirincova, M., Lancaric, D., Savov, R. (2013). *Applying the Concept of Diversity Management in Organisations in the Czech Republic and the Slovak Republic: A Research Survey*. *Journal of Technological and Economic Development of Economy*. Volume 19, Issue 2, (2013), pp. 350 - 366.
3. Ella, J. 2009. *Cadbury: The legacy in Birmingham*. [online] BBC. Retrieved: <http://news.bbc.co.uk/local/birmingham/hi/people_and_places/history/newsid_8412000/8412655.stm>. Access: 18.01.2016
4. European Commission. (2011). *A Renewed EU Strategy 2011-14 for Corporate Social Responsibility*. [online] COM (2011) 681 final, Brussels, pp. 15. Retrieved: <http://ec.europa.eu/enterprise/policies/sustainable-business/files/csr/new-csr/act_en.pdf>. Access: 29.12.2015
5. Fazekasova, M. (2006). *Manažment teórie a praxi*. [online]. Retrieved: <<http://casopisy.euke.sk/mtp/clanky/3-4-2006/fazekasova.pdf>>. Access: 18.01.2016
6. Gond, J. P., Moon, J. (2011). *Corporate Social Responsibility in Retrospect and Prospect: Exploring the Life-Cycle of an Essentially Contested Concept*. Nottingham University Business School, pp. 40.
7. Gurska, S., Valova, A. (2013). *Corporate Social Responsibility in Mining Industry*. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*. Volume 61, Issue 7, pp. 2163-2170.
8. Jones, T. M. 1980. *Corporate Social Responsibility Revisited, Redefined*. In *California Management Review*, pp. 59-67.
9. Katsoulakos, P. – Koudsodimou, M. – Matraga, A. and Williams, L. 2004. *A Historic perspective of the CSR movement*. White paper, INLECOM, Ltd.
10. Machova, R., Mura, L., Korcsmaros, E., Huszarik, S. E., Buleca, J., Haviernikova, K. (2015). *Innovation Business and Evaluation of Innovation Potential of Business Nets (Inovačné podnikanie a hodnotenie inovačného potenciálu podnikateľských sietí)* Brno TRIBUN EU, pp. 182.
11. Mura, L., Buleca, J. 2013. *Trends in International Business of the Slovak Small and Medium Food Enterprises*. In *Procedia-Social and Behavioral Sciences*, Volume 110, pp. 905-912.
12. Obtulovic, P. (2004). *Biostatistics (Biostatistika)*. Volume 3. Nitra: SPU, pp. 132.

13. Palkechova, L., Svoradova L., Viragh R. (2014). *Analysis of Vacation Behaviour in Rural Tourism and Agrotourism in the Slovak Republic Conditions*. In Proceedings from IX International Conference on Applied Business Research ICABR 2014, 782. Retrieved: <http://www.icabr.com/fullpapers/icabr2014.pdf>. Access: 04.01.2016
14. Skypalova, R., Kučerova, R. (2014). *The Role of the State in Launching Social Responsibility in Small and Medium Enterprises*. In Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, Volume 62, Issue 6, pp. 1407-1415.
15. Ubreziava, A., Horska, E. (2011). *Perception and Approach towards Corporate Social Responsibility in SMEs: Case Study of Slovak and Czech Republic*. In: PEFnet 2011 "European Scientific Conference of Ph.D. Students, Brno: Mendelu, pp. 1-7.
16. Ubreziava, I., Stankovic, L., Mihalcova, B., Ubreziava, A. (2013). *Perception of Corporate Social Responsibility in Companies of Eastern Slovakia Region in 2009 and 2010*. In Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis. Volume 61, Issue 7, pp. 2903-2910.

PERSPECTIVE DEVELOPMENT OF NEW SPECIES IN LATVIAN AQUACULTURE

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Abstract. The present paper studies the economic feasibility of certain new species in aquaculture and the market potential for their breeding in Latvia. Aquaculture is a rapidly developing industry in the world. Its volumes are increasing also in Latvia; however, there are few species that are bred in large volumes. Therefore, there exists an essential need for research on the species suitable for breeding. Aiming at studying the economic and market potential of particular less bred species, tilapias, chars, sturgeons and shrimps were selected for this research.

The research involves methods of economic analysis. The balance method was applied to analyse the markets for the researched species. A semi-quantitative method – McKinsey matrix – was applied to determine the potential export markets. McKinsey matrix was developed for particular species of fish on regional markets identified in advance.

The performed analysis provides a basis for concluding that breeding of sturgeons (Siberian and Russian sturgeons, sterlets and bester fish), chars as well as shrimps (*L.Vannamei*) has a potential in Latvia and that these fish should be included in the list of supported aquaculture products.

At the same time, taking into consideration that most of the consumers do not recognize these products, there is a need for promotional activities. Collaboration with foreign companies to acquire the export markets has a perspective regarding this.

The potential for breeding tilapias has not been justified due to the market situation in Europe (availability of cheap mass product) and the comparatively high production costs in Latvia.

Key words: aquaculture, species, production data, competition.

JEL code: D2, D4, Q22.

Introduction

The research aim is to study the economic substantiation and the market opportunities for less popular fish and shellfish bred in Latvian aquaculture.

Aquaculture is one of the most rapidly growing industries in the world. Its role in Latvia is rather small at present but it exhibits a growing tendency. According to statistical data, 680 tons of aquaculture production (fish and shellfish) were sold in Latvia in 2014. Over three years, 25% increase in production volumes has been reached. However, for the present, it does not reach even 1% of the fishery volume. At the same time, the trend both in the world and in Latvia is that the proportion of aquaculture products in the consumption of fish and other aqua products is increasing, thus the industry presents the growth potential. Aquaculture is a rather capital-intensive and high investment-risk industry. Therefore, information about the costs of breeding various potential species, about the sales prices and the market potential is of utmost importance in order to start a successful business activity.

The hypothesis set for the research is that it is possible to develop a feasible production of new, previously less known aquaculture products in Latvia.

The following objectives have been set to attain the aim:

- to assess the breeding costs (feed, energy etc.) of the selected species in particular enterprises for various species and to assess the main factors affecting them as well as the potential production price taking into account the costs;
- to develop the economic justification for selected species, taking into account the type of production technology and the production volume;
- to study the demand and supply of the aquaculture production for the selected species;
- to analyse the export opportunities for the selected species.

To perform the research, Latvian and foreign research and publications, materials of international conferences in aquaculture industry,

laws and regulations, database information of the Rural Support Service (RSS), data of the Central Statistical Bureau (CSB), EUROSTAT database information as well as consultations with leading experts of Latvian aquaculture, industry specialists and fish breeders, including the information gathering from the fishery farms.

Within the research framework, the data available on the approximate costs of the respective species when bred in recirculation systems (WRS) with different volumes are collected, the factors affecting the costs are analysed and the potential sales price are calculated, taking into account the production volume and the sales price. The Latvian and international markets for the particular species are analysed, the market potential and the opportunities for Latvian farmers are assessed. Both aspects - production costs and the market potential are taken into consideration for developing the conclusions and recommendations.

The research applied methods of economic analysis. The desk research method, interviews, calculation, comparative analysis used to calculate the economic substantiation and to obtain information. The potential export markets were determined by applying a semi-quantitative method – developing McKinsey matrix for particular types and products of fish in regional markets identified in advance.

The numerical information collected in the research is indicative, taking into consideration the small number of enterprises that deal with producing the researched products and the little experience in breeding the fish and promoting them. It has to be taken into consideration that the Latvian market is small; so a rapid increase in the supply can significantly affect the price. Hence it is understandable that attaining a significant aquaculture volume is closely linked with export opportunities.

Research results and discussion

1. Brief characteristics of the species included in the research

Fish of the sturgeon family

In the world, sturgeons are mainly bred for obtaining caviar. Due to the reduced stock, fishing sturgeons has been almost completely stopped in the world. Therefore, they are mainly bred in aquaculture. The main producing countries in Europe are Italy and France. Breeding sturgeons to obtain fish meat is less popular worldwide albeit flesh constitutes 67% of the sturgeon. Its meat is of very good quality and it does not contain bones (European Commission, 2012).

Latvia also belongs to the sturgeon breeding countries. In recent years, the volumes of breeding sturgeons have increased rapidly in Latvia, and it has become the second most popular species of fish, right after carps. Siberian sturgeon, sterlet, Russian sturgeon as well as belugas and sterlet hybrids – bester fish are the most popular species of the sturgeon family.

Tilapia

Tilapia is one of the most popular aquaculture fish in the world. The total aquaculture production volume of tilapia reaches 4.7 Mt. The total volume of tilapia fishery constitutes about 0.75 Mt. In Europe, the production volumes are insignificant due to the too high production costs. All significant production countries of the world are located in the tropical climate zone. One third of the total volume is produced in China; large volumes are produced in other Asian and Latin American countries (FAO, 2013).

In 2011-2014, tilapia was cultivated in Latvia but the production volume was small: 1 – 2 tons per year. Several industry specialists have expressed their opinion that competitive breeding of tilapia is burdened because the fish loves warmth, so the power consumption would be much higher than in the countries that are located more to the south.

The fish is not demanding regarding the purity of water, hence it is suitable for mass production in the countries that have warm climate all year round. According to the information provided by the producers, other neighbouring countries (Poland, Estonia) that had started production of tilapias have also stopped it.

Char

In difference from all the other species included in the research, char is cold-water fish. Due to this reason, their breeding volumes are limited and more than 90% of the European char production comes from the region of Nordic countries (Island and Scandinavia). Char has high tolerance to fish density, so they are well suited for inland aquaculture. The global production volumes of char are comparatively small - about 6000 t in 2013. The char is bred in Iceland, Canada, Sweden, Norway, Finland, Estonia, Ireland and in West Virginia in the USA. Iceland with its 3300 t is the largest producer. The char is a high-quality salmonid fish with high fillet output (55-57%). In the north of Europe, breeding of char in aquaculture is increasing (Thorarinsdottir R.I., 2013).

In the recent 3-5 years, breeding of char has also started to develop in Latvia. Chars are feeding most actively at the temperature +4...+16 °C. In Latvia, cold-water fish can feed significantly longer and gain weight faster than in the arctic regions of Scandinavia (which are the natural areas inhabited by char), where winters are longer and colder.

The most widespread species of the char are the Arctic char and the brook trout. Interbreeding of the species is popular, resulting into the Sparctic char.

Shrimps

Searching new objects appropriate for breeding in aquaculture, especially in water recirculation systems (WRS), shrimp is a product of interest because it is the most significant fishery product in international trade regarding the value. Global production volumes of shrimp

reach approximately 7 million tons (2011), with the proportion of shrimp produced in aquaculture of about 55% (FAO, 2013).

The most significant countries producing shrimp are China, Thailand, Vietnam and Indonesia, which in total produce 80% of the global output.

Although shrimp, like tilapia, are bred in aquaculture almost only in the countries with a warm climate, the breeding technology in these countries has caused sharp protests of several international environmental protection organizations (Greenpeace a.o.). The quality of shrimps produced this way is also doubtful because in many developing countries the food standards are often incomplete or are not sufficiently followed.

As a consequence, the demand for live (fresh) shrimps is becoming more stable in the rich countries' markets even though these shrimps are more expensive than the frozen products of the tropical countries. Fresh shrimps are conquering the market niches of many countries as a Premium class product.

There are several commercial shrimp species. Previous studies (Nipers etc., 2015; Mitans A., 2013) allow conclude that the most suitable specie for breeding in Nordic environment is the white shrimp (*L.Vannamei*).

2. Assessment of the market potential

Based on the research of the demand and supply of the aquaculture fish and shellfish market, it become possible to identify the potential domestic and export markets and factors influencing competitiveness (Table 1) for them.

The potential markets for sturgeon meat are Latvia, Europe, Russia and other countries of the CIS, the USA. However, the attractiveness of Russian and the CIS markets is reduced by the low purchasing power of their population. Hence the market opportunities for surgeon meat are assessed only in Latvian, European and USA markets.

Table 1

Factors of competitiveness and market attractiveness for Latvian aquaculture products included in McKinsey matrix and significance of these factors

Competitive power (internal factors)	Factor significance	Attractiveness of the market (external factors)	Factor significance
Market share	3	Market capacity	3
Growth of the market share	2	Market growth	2
Assets and competences	3	Pricing trends	2
Marketing and distribution	3	Intensity of competition	3
Relative costs	3	Entry barriers	2
Production capacity	2	Demand fluctuations	1
Stability of the offer	2	Segmentation	1
Quality	2	Distribution structure	2
Climatic risks of production	2		
Veterinary risks of production	2		
Logistics	2		

Source: authors' assessment

In recent years, changes have been taking place in sturgeon caviar markets as the offer of the major exporting countries Iran and Russia has been decreasing but the demand has not changed significantly (Adeli A., Namdar M., 2015; Engler M., Knapp A., 2008). The market opportunities for sturgeon caviar were assessed for the markets of Latvia, Europe, the USA and the Middle East countries of Asia.

Markets for char are relatively unsaturated but the demand concentrates in developed countries with high consumer purchasing power and high impact of population health concerns on the demand (Arctic Rose Inc., 2011).

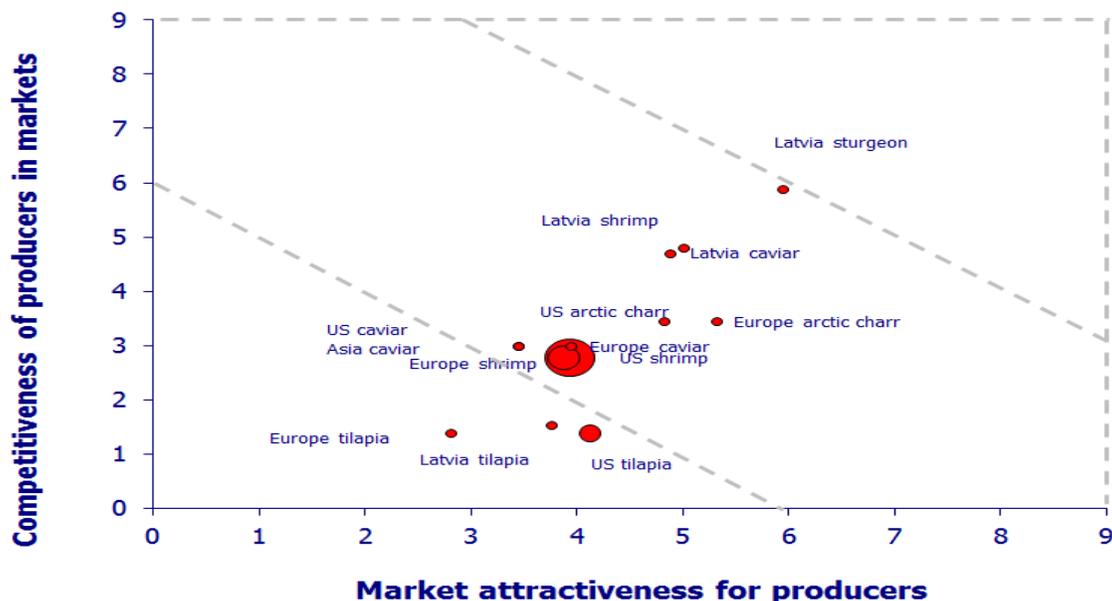
In recent years, the competitiveness of Asian countries on the most significant markets for shrimp has been decreasing due to quality problems. Hence increases the market opportunities for a more qualitative offer for a

higher price (Jory D., 2014). The market opportunities for char and shrimp were assessed in Latvian, European and US markets.

After discussions with experts, the external (attractiveness of the market) and the internal (competitiveness of the specie/product) factors and their significance are established. The factors used and their estimated importance are presented in Table 1.

To assess the market potential for Latvian aquaculture products, McKinsey matrix is developed as follows: the horizontal axis is used to depict the product position in the potential markets but the vertical axis is used to depict the market attractiveness of the region or a particular country.

The obtained competitiveness matrix is presented in Figure 1.



Source: authors' construction

Fig. 1. Competitiveness of Latvian aquaculture produce for markets with different levels of attractiveness

Enterprises are advised to start or continue their operation in the markets that are positioned in the top right triangle of the competitiveness matrix. However, location in the bottom left triangle in the competitiveness matrix requires divesting – either terminating the present operation or not starting it. Starting or continuing business activity in the markets whose position in the competitiveness matrix is in the middle segment is related to risks. The risks are lower if the position of the enterprise in the competitiveness matrix is above the diagonal which is drawn from the bottom right corner to the top left corner.

Development of the economic substantiation

This subsection comprises the information analysed during the research about the production costs and the sales prices in order to assess the feasibility of breeding the studied

species. The paper summarises the breeding costs in WRS, which is the most rapidly developing aquaculture technology in Latvia and which provides the opportunity to produce larger volumes.

To assess the breeding costs, the tentative costs for producing 1 kg of fish (or shrimp) were summarised across the most important positions (Table 2). Taking into account the particular applied technologies depending on the planned production volumes, the dependence of costs on the production volume can also be assessed. Using the example with sturgeons (this species offered the most detailed information available), it can be assessed that increase of the production volume from 5 to 45 tons per year reduces production costs per every kg of production output by EUR 0.5 or by 13%.

Table 2

Indicative assessment of production costs for the live weight of 1 kg of the aquaculture species included in the research (EUR)

Products	Production volume (t/year)	Feed	Energy	Work	Fingerlings/larvae	Maintenance	Other cost	Total cost (EUR/kg, without investment)
Sturgeon	5	1.61	1.64	0.38	0.39	0.25		4.27
	10	1.61	1.54	0.33	0.39	0.25		4.12
	45	1.61	1.27	0.29	0.31	0.25		3.73
Sturgeon roe	2	1.61	24.83	45.00	42.50	35.00		148.94
Tilapia	100	0.83	0.69	0.20	0.23	0.10	0.20	2.25
Char	150	1.40	0.40	1.00	0.50	0.25	0.50	4.05
Shrimp	50	2.34	0.58	2.40	0.35	0.20	0.55	6.42

Source: author's calculations based on the information provided by industry specialists

As the data in the table indicate, production of sturgeon roe or caviar has the highest costs but taking into consideration the high price, its production can also be the most profitable one because the producer's price for caviar reaches 600 EUR/kg in Europe, and even more for the most valuable species. The retail price in Latvia reaches 700-1500 EUR/kg.

Regarding breeding, the second most expensive species is shrimp. However, as the table indicates, when bred in large volumes, its costs increase the production costs of sturgeon and char only almost twice but their sales price is significantly higher.

Char and surgeon belong to the "expensive" fish whose production costs comprise about 4 EUR/kg even without any investment. At the same time, if cost reduction measures are implemented, these fish can also be produced in a cheaper manner. For example, sturgeon need warm water resulting into is higher power-intensity. Therefore, heat isolation of a building, economic heating and other factors are important as well as the possibility to build a WRS at a

cogeneration station to utilize the heat it produces (Muscalu-Nagi R., 2009). The mentioned aspect of heat is even more significant when breeding shrimp and tilapia, as the optimal temperature for their breeding is 26°-30°C.

Breeding of tilapia at Latvian conditions is significantly limited by the heat requirement of the fish. The heat consumption for its breeding is similar to that for shrimp but the product price is many times lower. It has to be added that the table reveals costs for producing large volumes of tilapia – 100 t per year but considering the cheap import, developing a large capacity tilapia production unit in Latvia would be extremely risky.

In addition to this, different investment costs should be taken into consideration. The paper summarises information about the necessary investment for a particular production volume. Entering both investment and production costs in the calculation, it is possible to calculate the period for the return on investment (Table 3) given the particular expected sales prices.

Table 3

Indicative assessment of costs, potential sales price and return on investment for breeding the aquaculture species included in the research

Products	Production volume (t/year)	Required investment (thous.EUR)	Production costs (EUR/kg, no investment)	Expected market price, EUR/kg	Return on investment period (years)*
Sturgeon	5	142	4.3	6.5	12.9
	10	250	4.1	6.5	10.4
	45	700	3.7	6.0	6.8
Sturgeon roe	2	1 060	150.0	400.0	2.1
Tilapia	100	520	2.3	2.0	-20.8
Char	150	2 100	4.1	6.0	7.4
Shrimp	50	3 100	6.4	25.0	3.3

* A negative figure indicates that production costs increase the sales price; thus, the investment cannot pay off

Sources: authors' calculations using the information collected

The calculation of the period for the return on investment is performed applying the following formula: return on investment period = required investment / market price*breeding volume – costs*breeding volume.

If the period for the return on investment is positive, then it is concluded that production is feasible upon the given conditions. It has to be added that the price of shrimps is conditional because now, with the volume of 2 t per year, it reaches 35-45 EUR/kg but when the volume increases, it is planned that the price declines, making the product more available. However, it will stay higher than the one for the imported product. The perspective of breeding shrimps has to be attributed exactly to the Premium class product, which is demanded in Europe.

The current sales price for surgeon and char is from 5 to 10 and more EUR/kg. The price included in the table 6.0 – 6.5 EUR/kg has to be assessed as rather modest but realistic when the production volume increases and the products become more recognized on the market.

The data in the table indicate that following the assumed conditions, breeding surgeon for caviar and breeding shrimps have the shortest period for the return on investment. The results obtained via calculations also approve the assessment of the industry specialists. It has to

be admitted, however, that for producing surgeon caviar, the table comprises only the time after when the first production starts appearing but prior to that at least 5 more years are required to breed the females. Theoretically, it would also be possible to purchase the females but it is rather difficult to carry out..

The experience shows that enterprises producing lower volumes usually can sell their products for a higher price. That happens because the product is more often sold to the end users not to wholesalers. In addition, there is a demand for fresh products.

It is difficult to determine the expected price for tilapia because the current price for fresh tilapias is 3-3.6 EUR/kg but farmers admit that there is lack of demand. Hence in breeding large volumes, the price of the imported product should be taken into account (1.50-1.90 EUR/kg). Therefore, there is a basis to question the opportunity to produce tilapias successfully at the present competitive price.

Assessment of the dependence of the costs on the production volume according to the data summarised in the table proves that the production volume impacts significantly the period for the return on investment (in the example with sturgeons it is from 6 to 13 years depending on the production volume). However,

such calculation is true only with the indicated sales prices. When the price increases to 7 EUR/kg, with the production volume 5 t per year, the return on investment period will reduce to 10.5 years. Farmers' experience (including the data about the beneficiaries of the RSS support) approve that feasible aquaculture is possible only with relatively small production volumes. Of course, in this case it will be a supplementary business for the enterprise or the rural farm that also operates in other businesses.

Fish-farming specialists indicate that the cost level can significantly differ for every producer, and it depends on several individual factors. Hence the figures offered in the present paper should not be perceived as a standard but rather as an example for comparing the species considered for breeding. Potential farmers have the opportunity to enter their particular parameters in the calculation and thus obtain an idea about the expected costs and the required sales price.

Conclusions

1) The performed analysis provides the basis to conclude that there is a perspective for breeding sturgeon (Siberian and Russian sturgeon, sterlet and bester fish), char as well

as shrimp (L.Vannamei) as Premium product in Latvia.

2) Taking into consideration that most of the consumers have little recognition of these products, there is a need for promotional activities. Collaboration with foreign companies in acquiring export markets has a perspective.

3) The perspective of tilapia breeding has not been justified taking into account the market situation in Europe (availability of cheap mass product) and the comparatively high production costs in Latvia.

4) It is possible to make the production by 25-30% cheaper by increasing the production volume from 5 t to 45 t per year. Further increase of the production volume (above 50 t per year) provides a relatively lower reduction of costs. At the same time, profitable production is possible also with small volumes but in this case, it will be just a supplementary business for the enterprise or the farm.

Bibliography

1. Adeli, A., Namdar, M. (2015). *The Iranian Caviar and its Substitutes in the World Market*, Ecopersia, 2015, 3 (1), pp. 933-944.
2. Arctic Rose Inc. (2011). *Arctic Char Aquaculture 2011: Assessing Status - Identifying Opportunity*. Final Report. p. 147. Retrieved: http://www.irzc.umcs.ca/flash_content/Dossier%20PDF/Publications/ACRDP_Final_Report.pdf Access: 11.01.2016.
3. Engler, M., Knapp, A. (2008). *Briefing on the Evolution of the Caviar Trade and Range State Implementation of CITES Resolution Conf. 12.7 (REV. COP 14)*, Report prepared for the European Commission, Contract 070307/2007/479422/MAR/E2
4. Ercan, E. (2011). *A Glance on Sturgeon Farming Potential of Turkey*, International Aquatic Research, 2011, No. 3, pp. 117-124.
5. European Commission (2012). *Sturgeon (Acipenser baerii)*. Fisheries and Aquaculture in Europe. No. 56, June 2012.
6. FAO (2013). *Fishery and Aquaculture statistics*. FAO Yearbook 2011, Rome. Retrieved: <http://www.fao.org/docrep/019/i3507t/i3507t.pdf>. Access: 07.01.2016.
7. Jory, D. (2014). *Indiana Indoor Shrimp Production Brainstorming Session*, Indiana Soybean Alliance, Indianapolis, IN, April 23, 2014
8. LVAEI (2013). 2.prioritara virziena ekonomiska analize saistiba ar akvakulturu un potencialo tirgus izpeti (Economic Analysis of 2nd Priority Axis in connection with Aquaculture and Research of Potential Markets). p. 103. Retrieved: http://www.lvaei.lv/images/LANN/Akvakulturas_%20tirgus%20petijums_2013.pdf Access: 11.01.2016.
9. Mitans, A. (2013). *Garnelu akvakulturas iespējas Latvijā un pasaule (Possibilities of Shrimp Aquaculture in Latvia and World)*. / Latvijas zivsaimniecības gadagramata (Latvian Fisheries Yearbook) 2013, LLKC. pp. 115-121.
10. Muscalu-Nagi, R. (2009). *Sturgeon Farming with Minimum Resources*. IV International conference "Fishery", Belgrade. Conference proceedings, pp. 66-69.

11. Nipers, A. et al. (2015). Garnelu produkcijas ilgtspēja Latvijas akvakultūra un perspektīvas Baltijas un Skandināvijas valstu noieta tirgos (Sustainability of Shrimp Production in Latvian Aquaculture and Perspectives in Baltic and Scandinavian Markets). Jelgava, LLU. p. 25. Retrieved: <http://www.llu.lv/getfile.php?hash=5771c56768b54cdd776f8792f23e5aa2> Access: 11.01.2016.
12. Thorarinsdottir, R. I. (2013). *Prospects of Farming Arctic Char (Salvelinus Alpinus L.)* Aquaculture Europe 2013 - Trondheim, Norway. Retrieved: <https://www.was.org/easonline/AbstractDetail.aspx?i=2079>. Access: 07.01.2016.

BEHAVIOURAL DIMENSION OF SOCIAL CAPITAL OF RURAL AREAS IN POLAND

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Abstract. In economics there has been a growing interest in non-material values, and the concept of social capital is regarded as an important endogenous factor of socio-economic development at regional and local level. This paper discusses the topic of a behavioural dimension of social capital in Poland. The aim of the study is to determine the activity of inhabitants in the formulation of development strategy of the commune by analyzing the case of rural and urban-rural communes. The participation of local citizens in strategy formulation is not obligatory but it guarantees the creation of a document to meet their real needs and it is very desirable from the perspective of the development of rural areas. The empirical section of the paper includes the findings of questionnaire surveys conducted in 2015 in the commune offices, relating to the way of the organization of the work on strategy, forms of inhabitants' participation and their involvement as well as conditioning factors of the inhabitants' activity. The survey conducted in the communes shows that there is a relatively low level of social capital in terms of its behavioural dimension. Respondents pointed to the following main causes of a low level of inhabitants' activity: lack of the knowledge of the importance of strategy and the opportunity to participate in its formulation, passivity, which is typical of rural areas, mentality, low level of trust in the authorities, lack of time and the lack of a sense that one can influence one's surroundings.

Key words: social capital, inhabitants' activity, rural areas, local development strategy, commune.

JEL code: D71, D85, O15, O18

Introduction

The concept of social capital is discussed in many fields and contexts (Sarracino F., 2009; Klimowicz M., Bokajlo W., 2010; Skawinska E., 2012). Social capital is considered to be a development factor, both on a nationwide level, and on regional or local level (Klodzinski M., 2003; Antoci A., Sabatini F., Sodini M., 2009; Strzelecki Z., 2011; Wojewodzka-Wiewiorska A., 2011a, 2011b). In literature, among many issues linked up with social capital, there are the issues of a multitude of definitions (Czapinski J., 2013), problems with the measurement of social capital (Theiss M., 2005; Westlund H., 2006; Lopaciuk-Gonczaryk B., 2012), which often result from the limited availability of statistical data, spatial differentiation in the level of social capital and the causes and consequences of a low level of social capital in a given area.

The concept of social capital should be understood as network ties between local entities, cultural traditions, norms and standards of social behaviour and common attitudes which are conducive to long-term cooperation, deepening of economic relations and trust formation. Social capital is a set of informal

values and ethical norms shared among members of a certain group of people, which enables them to effectively cooperate towards achieving the intended goals (Fukuyama F., 2003). In literature, one may come across various dimensions of social capital, such as: structural, regulatory and behavioural (Krishna A., Uphoff N., 2002; Grootaert Ch., Bastelaer Th. van., 2002; Theiss M., 2005; Kaasa A., Parts E., 2007; Skawinska E., 2012). This paper discusses the issue of participation of the inhabitants in the work on formulating a development strategy of the commune, which is associated with a behavioural component of social capital, encompassing, *inter alia*, cooperation and collective action. At the same time, reference is made to the work of Putnam, who defined social capital as the cooperation of individuals and their involvement in various initiatives, primarily on a local level.

The development strategy of the commune¹ is a long-term planning process which determines

¹ Nowadays in Poland exists a three-level administrative division, introduced on 1 January 1999. The largest units are voivodeships (there are 16 voivodeships), the second-level units are counties (380), and the smallest units are communes (2479). There are three types of

strategic objectives of its development, describes the way of their realization, and envisages the allocation of various resources, in particular financial means (Kozminski A. K., Piotrowski W., 1997). In Poland, the development strategy of the commune is not an obligatory document; however, in practice most communes have such a document, since it fulfils a number of important functions. It is a basis for writing grant applications for external funding, including the European Union funding. During discussions on the various methods of strategy formulation it is always emphasized that inhabitants or their representatives need to participate in the process. Participation of a local community in the project preparation phase is of utmost importance, since its members may communicate their real needs relating to the development of the region in which they live, which, in turn, guarantees more success in strategy implementation. Participation of the inhabitants is a necessary condition for building a good strategy.

Studies show that in Poland the level of social capital is relatively low, which may also concern the preparation of a document such as local development strategy. In addition, there are clear-cut differences in the level and forms of social capital in the countryside and in towns, the level of social capital being lower in rural areas (Wojewodzka-Wiewiorska A., 2015). In literature, however, there are opinions that the activity in rural areas is great but it is difficult to measure due to its non-formalized character (Herbst J., 2008).

The aim of the paper is to determine the activity of inhabitants in the formulation of development strategy of the commune in the case of rural and urban-rural communes in Poland. It is important to emphasize that in practice the inhabitants are not obliged to participate and cooperate with the local

communes: urban, rural and mixed (urban-rural).

authorities, and that their involvement and attitudes during the process of preparation of a strategic document on a local level point to the level of social capital. Surveys were conducted in 2015 using a questionnaire in randomly selected communes which have a current development strategy and where the inhabitants participated in the preparation of the document². Closed and open questions were addressed to the employees of the commune offices who were responsible for the implementation of the development strategy of the commune and who were acquainted with the course of the process of strategy creation and implementation. A comparative analysis was made of the activity of the inhabitants of rural and urban-rural communes.

The issue of inhabitants' participation discussed in the paper being a manifestation of behavioural social capital in the given area makes a contribution to the discussion on social capital in Poland on the micro level using the author's own surveys. It is particularly important in view of the problem of lack or limited availability of public statistical data, especially at a local level and with reference to rural areas, which makes it necessary to conduct more in-depth interviews to describe in a detailed way the conditioning factors and the manner of undertaking collective activities.

Research results and discussion

During the survey data collection it turned out that in many communes there was no person (or post) in the commune office who would know the document in the context of its realisation. Often there is no documentation concerning the organization of work on the strategy. This may indicate that there is a lack of knowledge of the significance of the document as an instrument of

² Findings were presented for 123 communes, including 85 rural communes and 38 urban-rural communes. Due to the facultative character of the document of development strategy of the commune, it is not known how many communes in Poland have such a document and how many units engage their inhabitants in the process of preparation of this document.

management and benefits stemming from its actual use. Persons who were appointed to answer the questions connected with the strategy were usually employees holding the posts of inspectors (28%), commune secretaries (25%), heads of departments (24%), commune heads and mayors or their deputies (7%).

In the rural and urban-rural communes surveyed, in which the inhabitants were involved in the process of formulation of the development strategy, most of the participants were exclusively representatives of the inhabitants. Only in 31% of rural communes and in 24% of urban-rural communes the invitations for participation were sent to all inhabitants. Among persons selected to take part in the creation of the strategy there were counsellors (20% of answers), elected chairs of the village council (over 17%), entrepreneurs (including farmers) - 13.4% of answers, representatives of education, culture (including teachers) and members of associations (12% of answers per group) as well as employees of the commune offices (7% of answers). The following participants were also mentioned by respondents: junior high school youth, firemen and priests from the parishes located in an area of the commune. In two cases the invitations to take part in strategy formulation were sent using a specific key, for

example every fourth household in each commune.

There were various ways of informing the inhabitants or their representatives about the possibility of participation in the work on development strategy of the commune, which were applied simultaneously (Table 1). The most popular channels of information transfer were announcement boards in the particular seats of the chairs of village councils and in the commune office as well as placing the information on the commune website. In 24 rural communes and only in 5 urban-rural communes respondents also pointed to a great help from the elected chairs of the village councils, who directly circulated the questionnaires among inhabitants. Other ways of passing information in the communes include: local press announcements, sending information and questionnaires by the traditional post, and, sporadically (i.e. in one or two communes), making phone calls to the inhabitants, sending SMS messages, using parochial announcements or community service network. Respondents in the communes also indicated that the inhabitants could get acquainted with the strategy project which was made available for inspection in the commune office. Besides, urban-rural communes informed people about the ongoing work on the development strategy in the means of public transport.

Table 1

Ways of informing the inhabitants about the possibility of participation in the building of the commune development strategy (percent of answers)

Ways	Rural communes	Urban-rural communes
announcement boards	28	21
commune website	26	26
information provided by the elected chairs of the village councils	17	7
local press	8	16
sending personal invitations	7	9

Source: author's calculations based on the survey research

In an overwhelming majority of the communes under review meetings were held with

the inhabitants or their representatives, in 75% of rural communes and in 79% of urban-rural

communes respectively. Most often, up to five meetings were held, and in nine communes more than ten meetings were organized. As regards the number of people who attended the meetings, respondents, that is to say persons responsible for strategy in the commune office, did not have any documentation stating exactly how many people attended the meeting organized by the commune, which shows that there was no formal approach to the work on strategy. Therefore, as indicated in various studies on social capital in Poland, there were no statistical data relating to various dimensions of this form of capital. The number of people attending the meetings given by respondents provides evidence showing low interest and involvement of the inhabitants. In fifteen communes there were fewer than 20 participants, and the number of participants was decidedly lower in rural communes (in one commune only 2 inhabitants attended the meeting); only in 16 communes surveyed the meetings were attended by more than 100 participants. In the communes where no meetings were held, the people interviewed indicated that in view of a generally known low interest of the inhabitants in the affairs of the commune the distribution of the questionnaires was regarded as sufficient, and the inhabitants

could attend the meeting of the Commune Council, where the strategy project was discussed.

In the case of less than 44% of rural communes and 40% of urban-rural communes no questionnaire surveys were conducted among inhabitants. In the remaining part of the communes, where the questionnaire surveys were conducted there were various ways of passing the questionnaires to the persons concerned (Table 2) and they were used simultaneously. According to the answers of the people surveyed, the most frequent ways were: distribution by the elected chairs of village councils and distribution in the course of consultations and village meetings in rural communes as well as distribution of questionnaires in the offices and the possibility of downloading questionnaire forms from the website in urban-rural communes. Other ways used in practice included: putting the questionnaires in public places, including schools and stores, circulating them among the employees of self-government offices, sending them by the traditional post; only in two communes questionnaire surveys were conducted by telephone, and only in one commune the local press was used.

Table 2

Ways of transmitting survey questionnaires to construct a commune development strategy (percent of answers)

Ways	Rural communes	Urban-rural communes
distribution by the elected chairs of village councils and by officials	31	10
distribution in the course of consultations	24	6
commune website	16	26
distribution in the offices	13	32
putting in public places (schools, shops)	9	16

Source: author's calculations based on the survey research

When building development strategy, 69% of the communes under review made use of the services of an external company. Most often, the help of experts encompassed the entire process

of the preparation of strategy; only one-fifth of the communes surveyed, which made use of the services of an external company, reported that the help concerned a specific part or stage of the

entire process - evaluation, counselling, methodical consultation, help in the field of determination of the consistency of the strategy content with the EU requirements or coordination and summing up of the work on the document.

Respondents were asked whether the inhabitants readily participated in the process of creating development strategy of the commune. The survey showed the highest percentage of the communes in which inhabitants were rather involved (45%); however, the share of the communes in which inhabitants were rather reluctant to participate in strategy formation was high (36%). In many communes (11% of those surveyed) people were decidedly reluctant to take part in strategy formation, while only in 4% of the communes there were answers saying that the inhabitants were very actively engaged in the work on document creation. The analysis of the results according to the type of the commune, shows that in rural communes the inhabitants are decidedly less involved in the process of strategy formulation (the number of answers 'decidedly' and 'rather yes' amounts to 45%, while in urban-rural communes it totals 58%). In the case of as many as 41% of rural communes and 26% of urban-rural communes the results demonstrate that the inhabitants would rather not show interest in participation in the work on the strategy.

Very interesting conclusions were drawn on the basis of opinions of the respondents concerning the attitudes of the inhabitants and the causes of those attitudes. Among many answers explaining a high activity of the inhabitants, the people surveyed indicated that the inhabitants wanted to influence the development (19% of answers). In rural communes the low level of inhabitants' activity was explained by the fact that the inhabitants did not know what the strategy was and what it served (15% of answers). Respondents also indicated that the inhabitants did not become engaged in the process of strategy formulation

since they always remained passive and inactive in the face of similar situations or initiatives (16% of answers), which, according to respondents, was typical in precisely rural communes. In urban-rural communes respondents said that the inhabitants' passiveness was the effect of their mentality stemming from the previous political system and a low level of trust (as many as 17.2% of answers). Respondents also pointed to the lack of time and the lack of feeling that through participation in strategy formulation one can affect their surroundings due to the fact that the effects of strategy implementation would occur in the long run. This was evidenced, for example, by a small number of displays of the document placed on the website of the Commune Office (e. g. several displays) or by the fact that the Commune Office did not receive any applications or only one application concerning the content of the strategy. Inhabitants would rather show interest in personal affairs (or in the affairs of their street or housing estate) and not in general (common) affairs, unless there occurs the problem with which they are directly concerned; then the inhabitants' involvement greatly increases. At the same time, in the case of four (rural) communes the inhabitants' engagement was always high, which could also be seen during the process of strategy formulation; and recently, the inhabitants' interest in common affairs has been clearly increasing. In addition, some other issues are indicated in the commentaries: inhabitants do not feel that development is influenced through preparation of strategic documents (these are only "records on paper"), they have low trust in authorities and they are hardly interested in the documents of the commune; their involvement depends on the topic of the activities, on the age structure of the inhabitants (high activity if there are many young persons in the community and the reverse situation when there are more older people who are less interested in the affairs of the

commune); it also depends on the size of the village council area; local entrepreneurs show great interest in the affairs of the commune. Respondents also pointed out that there were some people in the commune who were always engaged in the commune affairs, for example elected chairs of village councils or professionals related to the functioning of the self-government.

The people interviewed were also asked whether the inhabitants took interest in the contents and realisation of the document in question. In 52% of the communes surveyed the residents were not interested in the document encompassing the development strategy of the commune, while in rural communes this interest was much more frequent. Respondents pointed out that the document could be found on the website; hence the inhabitants or other people who were interested in it did not come directly to the commune office. Among persons who asked about the strategy, students were mentioned most often, next came persons who directly participated in the process of strategy formulation, and they were followed by investors and other persons from the outside. Most often, residents ask the clerks about the stage of strategy realization, and thereby the strategy fulfils solely a control function. In addition, the inhabitants are interested in the document when they carry out construction or repair work, when they want to start business activity or when they prepare projects co-financed by the European Union.

Conclusions, proposals, recommendations

1) In the rural communes surveyed, local authorities, during the stage of preparation of the development strategy of the commune, decidedly more often engaged solely representatives of the various local milieus. Of the various forms of passing the information to the inhabitants, the most popular were announcement boards and placing the information on the website of the commune. The interest in those forms of activity was

low, which is indicated by a small number of the participants in the meetings and of the questionnaires they filled in. According to the persons responsible for strategy implementation communes inhabitants reluctantly engaged in strategy creation, which could be seen especially in rural communes. The low level of social capital identified in its behavioural dimension may constitute a barrier to the development of rural areas.

2) The low level of the inhabitants' activity in rural areas may not result from the low level of social capital but it may be an effect of the inappropriate information flow between the commune office and the inhabitants, and of the lack of knowledge of the significance of the document in the development of the commune and of its impact on the inhabitants' lives. Hence, in order to encourage the inhabitants to become involved in various activities at a local level and to draw the benefits for the development of rural areas and for the entire community it is important to effectively communicate among various entities. The authorities that are the initiators of strategy formulation must pay special attention to informing the individuals concerned about the development strategy and about its role as well as about the opportunity to participate in the process of its creation by adjusting, at the same time, the form of the message to the specified groups of receivers. Otherwise, inhabitants' participation will be insignificant.

3) When conducting effective activities aimed at the formation of social capital in Poland, it must be taken into account that there are various conditioning factors which affect the inhabitants' ability to cooperate and to undertake collective actions and which are often specific to the given country or even to its particular regions. In the analysis of the case of Poland, one must take into

consideration very complicated historical conditioning factors, which largely affected today's social attitudes of the inhabitants in rural areas, that is to say partitions of Poland, changes of its frontiers, the communist system as well as the processes associated with the systemic transformation or migration. Surprisingly, the survey demonstrates that the attitude of the authorities of the communes

surveyed, which, knowing that the inhabitants' interest in the affairs of the commune has always been low, did not try to undertake any activities to encourage the local citizens to become involved in the development of the area in which they live. One must identify the causes of the low activity of the citizens and undertake appropriate activities to shape active attitudes of the inhabitants.

Bibliography

1. Antoci, A. Sabatini, F., Sodini, M. (2009). *Fragility of Social Capital*. University of Siena. p. 1-8.
2. Czapinski, J. (2013). The State of Civil Society. Social Capital. Social Diagnosis 2013. *Conditions and Quality of Life of Poles*. Report. Czapinski J., Panek, T. (ed.). The Council for Social Monitoring. Warsaw. pp. 285-297.
3. Fukuyama, F. (2003). Social Capital. Harrisom, L.E. Huntington, S.P. (ed.). *Culture is important*. Zysk i S-ka. Poznan. p. 20. (in Polish).
4. Grootaert, Ch. Bastelaer, Th. van. (2002). *Conclusion: Measuring Impact and Drawing Policy Implications*. Grootaert, Ch. Bastelaer, Th. Van. The Role of Social Capital in Development. An Empirical Assessment. Cambridge University Press. pp. 343-345.
5. Herbst, J. (2008) Another Third Sector. *Non-governmental Organizations in Rural Areas*. Halamska, M. (ed.). Country NGOs. IRWiR PAN, Warsaw, pp. 33-75. (in Polish).
6. Kaasa, A. Parts, E. (2007). Individual- Level Determinants of Social Capital in Europe: *Differences Between Country Groups*. Tartu University Press. Tartu. pp. 6-7.
7. Klimowicz, M. Bokajlo, W. (2010). *Social Capital- Interpretations, Impressions, Operationalization*, Wydawnictwo Fachowe CeDeWu.pl. Warsaw. pp. 43-50. (in Polish)
8. Klodzinski, M. (2003). *Social Capital as the Main Factor Differentiating the Degree of Economic and Social Development of Rural Communities*. Adamowicz M. (ed.). The Local Development Strategies. Institutional Aspects, Vol. I, Wydawnictwo SGGW. Warszawa. pp. 161-169. (in Polish).
9. Kozminski, A. K. Piotrowski W. (1997). *Management - Theory and Practice*, Wydawnictwo Naukowe PWN, Warsaw. p. 123. (in Polish).
10. Krishna, A. Uphoff, N. (2002). *Mapping and Measuring Social Capital Trough Assessment of Collective Action to Conserve and Develop Watersheds in Rajasthan*, India. Grootaert, Ch. Bastelaer, Th. Van. The Role of Social Capital in Development. An Empirical Assessment. Cambridge University Press. pp. 86-87.
11. Lopaciuk – Gonczaryk, B. (2012). *Measuring Social Capital*. The National Economy. No. 1-2. pp. 1-23. (in Polish).
12. Sarracino, F. (2009). Social Capital and Subjective Well-Being Trends: Evidence from 11 European Countries. University of Siena. pp. 5-6.
13. Skawinska, E. (2012). *Social Capital in the Region's Development*. Wydawnictwo Naukowe PWN. Warsaw. pp. 14-40. (in Polish).
14. Strzelecki, Z. (2011). *Regional and Local Economy in Poland. Factors and barriers*. Oficyna Wydawnicza SGH w Warsaw. Warsaw. pp. 113-125. (in Polish).
15. Theiss, M. (2005). *Operationalization of Social Capital in Empirical Research*. Januszek H. (ed.). Social capital in communities. Wyd. AE in Poznaniu. Poznan. pp. 59-69. (in Polish).
16. Westlund, H. (2006). *Social Capital in the Knowledge Economy: Theory and Empirics*. Springer Berlin. p. 38.
17. Wojewodzka-Wiewiorska, A. (2011a). *Determinants of Rural Areas Development in the Theory*. Development Prospects of Rural Areas Lagging Behind in the CEE Region. Conference Proceeding. L. Villanyi. Godollo. Hungary. pp. 186-192.
18. Wojewodzka-Wiewiorska, A. (2011b). *Social Capital as an Endogenous Factor of Local Development*. Roczniki Naukowe SERiA. Vol XIII. Issue 6. Warsaw-Poznan- Wroclaw. pp. 255-259.
19. Wojewodzka-Wiewiorska, A. (2015). *Structural Dimension of Social Capital in Poland*. Urban Versus Rural Areas. Proceedings of the 7th International Scientific Conference: Rural Development. Raupeliene A. (ed.). Aleksandras Stulginskis University. Kaunas, p. 6.

FACTORS DETERMINING DEVELOPMENT OF BUSINESSES IN KUJAWSKO-POMORSKIE PROVINCE AS A PART OF THE POMERANIAN SPECIAL ECONOMIC ZONE - STUDY RESULTS

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Abstract: Production companies which operate in Special Economic Zones (SEZs) are the key element in leading the economic growth of Poland. They are responsible for new investment initiatives, which boost socio-economical situation of different regions in Poland. The aim of the research was to identify the factors which either facilitate or hinder business development in the newly-created SEZs. In order to perform the study, researchers used questionnaires among all companies operating in the Pomeranian Special Economic Zone (PSEZ). Researchers adopted the following hypothesis: operating in the PSEZ offers new opportunities for faster development of a business. The study proves beyond doubt that locating business in the PSEZ indeed offers producers a chance to speed up business development, and, what is more, significantly improves competitiveness. The study also shows that favourable conditions created in the zone may also moderately improve the general functioning of the whole company.

Keywords: Special Economic Zones (SEZs), entrepreneurship, business development, regional development.

JEL code: R11

Introduction

The creation of SEZs was an important step forward, not only for the businesses operating in the zone but also for the whole region and its overall development (Zajdel M., Michalcewicz-Kaniowska M., 2015). The main beneficiaries are micro- and small businesses, as they may take advantage of tax exemption. One of the main goals for SEZs was to facilitate and assist innovation in business, by helping those enterprises, which invent new production technologies and implement modern solutions in the process, aimed at increasing competitiveness of their products and services. Allocating special purpose areas in a country is hardly a new idea. The concept dates back as far as the ancient times. The first SEZs were established worldwide several decades ago, and they have been operating in Poland for a dozen or so years (Kolczynski M., Wojtasik W. 2010). SEZs are becoming an increasingly popular way of facilitating regional development and competitiveness of local businesses (Michalcewicz-Kaniowska M., Zajdel M., 2015).

The notion of "Special Economic Zone" has been defined by the National Ministry of Economy as "an administratively separate part of Polish territory, allocated for the running of businesses on preferential terms." These "preferential terms"

are numerous incentives offered to entrepreneurs doing business in the zones. This is a similar mechanism to that of social cooperatives, which also offer financial help and assistance aimed at supporting regional development (Zajdel M., Michalcewicz-Kaniowska M., 2015).

In the case of SEZs, this help can take the form of profits generated by investors being exempt from income tax, new investments receiving financial support at different stages of their development, and entrepreneurs purchasing complete development areas, tax-free, at competitive rates etc. (Polish Investment Promotion Agency, 2015).

The research concentrated on production companies that operate in the Special Economic Zone in Kujawsko-Pomorskie (part of the Pomeranian SEZ). The primary aim of the research was to identify the factors responsible for development of production companies in the zone. A detailed approach allowed to identify the following two groups: factors promoting company development, and those which obstruct it. The results should provide a satisfactory answer to the following dilemma: do production companies operating in the zone develop faster than their equivalents from outside? Researchers made the following assumption: production companies which operate in the Special Economic Zone are more likely to develop faster, and the co-

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operation with the Investment Project Management Bureau results in increasing their competitiveness. In order to support the above claim, the research was carried out between April and May 2015 among all production companies belonging to the Special Pomeranian Economic Zone in Kujawsko-pomorskie province. The questionnaire was made up of three parts, each of them including fourteen questions: one open, eight closed (single choice type), and five closed (multiple choice type). The first part of the questionnaire concerned factors determining development of production companies operating in the SEZ. The second part focused on analyzing competition between production companies in the zone. The third - and final - part of the study concerned the current situation of the companies as determined by belonging to the zone. The research used reports on Special Economic Zones published by the Ministry of Economics, decrees of the Cabinet about Designated Business Areas, and other legal acts, which regulate the functioning of the Special Pomeranian Economic Zone.

Results and discussion

1. Functioning of the SEZs as the driving force of entrepreneurship - theoretical background

The success of a company, and keeping in pace with its changing surroundings depend on effective support of entrepreneurship (Zuzek D., 2006). The above statement also applies to SEZs, which offer entrepreneurs exceptional conditions for doing business.

Creating and managing SEZs in Poland is regulated by the Special Economic Zone Act passed by the Polish Parliament on 20 October 1994 (Official Journal of Laws, 2015, ch. 282).

The free market economy was established in Poland as the result of significant political changes which took place in 1989. They have had a considerable impact on the creation of SEZs. The first SEZ was called "Euro-Park", and it was established in Mielec (Podkarpackie province) in

1995. Initially, it was treated as a preliminary project but soon more SEZs appeared: the Katowice and Suwalki SEZs (Trojak A., Wiedermann K., 2010). Currently, there are 14 SEZs, serving Poland's sixteen provinces. A special law was passed by the Cabinet in 2013, which secures the existence of every SEZ until 2026. Interestingly, the areas occupied by SEZs are continually expanded, currently occupying of 18 354 118 ha (Ministry of Economy, 2015). Generally, businessmen may choose an area and apply for it to be turned into SEZ. Successful applicants have to meet certain criteria, the size and the innovative character of the project being the most important ones (Baranski P., Krzyzak R., Mankowski M., Modzelewska A., 2014). What is more, it is imperative that the newly-created SEZs help in a region's development by creating new work places, increasing export, creating new technologies which can be used to help in developing the country's economy, increasing competitiveness of products and services, and developing the region's industry and its unused land (Siudak P., Wątopek W., 2011).

2. Development opportunities of production companies operating in the Pomeranian Special Economic Zone - research results

The subject of the study was the Pomeranian Special Economic Zone (PSEZ). It was established in 1994, its total area equals 1 859.24 ha, and it covers separated industrial areas in four regions: Pomorze (Pomerania), Zachodniopomorskie (West Pomerania), Kujawsko-Pomorskie province and Wielkopolskie (Greater Poland). Between 2005 and 2014 the PSEZ area was expanded by 1480.45 ha. While the smallest increase in the zone's area occurred in 2012, a mere 8.60 ha, the biggest increase of 482.64 ha was recorded in 2014.

Researchers carried out a detailed study, including all companies operating in the PSEZ in Kujawsko-pomorskie province. The feedback of the poll was 66%. At first, poll participants were asked which factors were critical for a company's

success, to which they replied "internal" (53%), and "external" (29%). The remaining 18% failed to provide a satisfactory answer. Then they were asked if they had taken a loan from a bank, to which the majority (92%) replied in the affirmative. Next, the respondents were asked to list factors which would be necessary for the successful development of companies in PSEZ. The questionnaires provided the following answers:

- business location and proximity of the road network (32%);
- quality of goods and services on offer (12%);
- qualified staff (28%);
- opportunity to obtain funds and get a loan (18%);
- dealing with public offices in a convenient and efficient way (0%);
- available technical infrastructure (12%);
- export (6%);
- new investments (22%);
- environmental policies (2%);
- information and promotion.

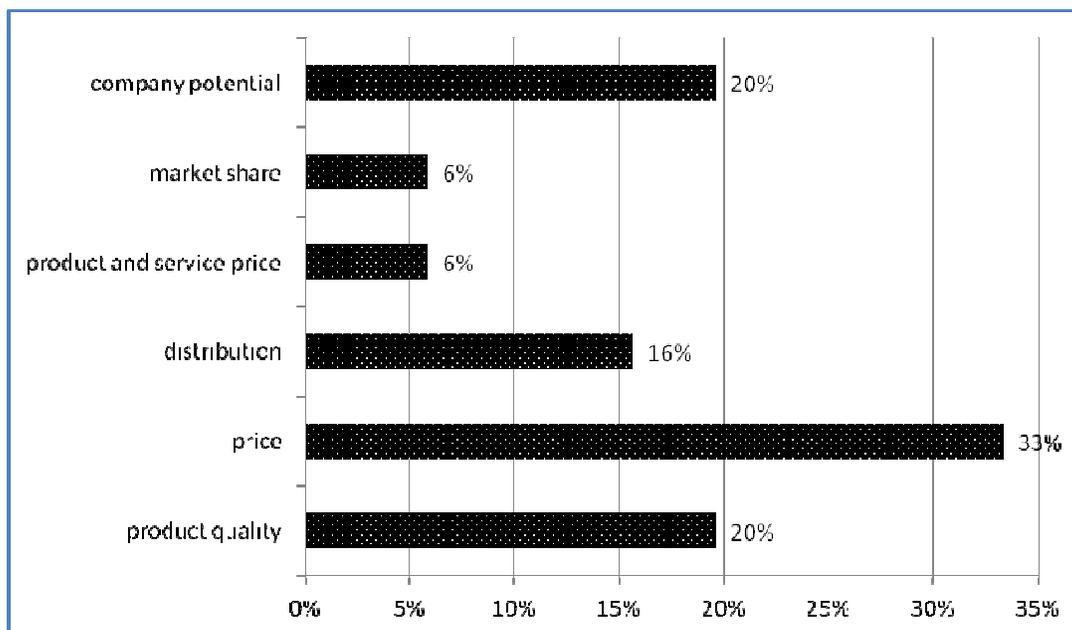
Not surprisingly, most respondents agreed that location of a business, with particular regards to proximity of the road network, was a decisive factor in its development. Employing qualified staff is also significant (28%). The third most important factor playing a key role in a company development is planned investment (22%). While offering quality products and services, and the availability of technical infrastructure were also recognized as fairly important, company's exports and its policy towards the environment were perceived as irrelevant by the respondents. So was "successful dealing with public offices" - perceived as not at all important for development of a company. The following factors were recognized as company development inhibitors: competition (26%), shortage of qualified staff (19%), high building rent and maintenance costs (13%), unstable

markets (0%), complicated and vague laws and tax regulations (10%), insufficient capital (8%), local administration (3%), low demand for products or services (14%), red tape (30%), transport infrastructure (0%). The study clearly shows that bureaucracy (30%) and competition (26%) are the two major factors responsible for hindering development of most companies. While the lack of trained and highly qualified staff (19%) or meagre demand for products and services (13%) may also be worrying, limited space to do business or contacts with local administration are perceived as a minor concern, recognized only by 3% of the polled. Neither did the respondents see high rent and maintenance costs, the existing transport infrastructure or unstable market as potential obstacles. Competitiveness is an integral part of the free market economy, and it is an indicator of a company's economic potential.

The majority of respondents took advantage of a bank loan to facilitate dynamic development of their companies. Interestingly, the respondents suggested that the PSEZ authorities should allow a three-month "trial period" for new businesses as a possible measure aimed at tackling excessive bureaucracy in the zone. With regards to customers, production companies operating in the PSEZ sell their products and services mainly to small and medium companies (51%), large businesses (36%), shops and wholesalers (18%). Small retailers or individual customers constitute only a fraction of the exchange (5%). When asked about the factors responsible for increasing the competitiveness of the PSEZ production companies, the respondents claimed that price was of primary importance (33%), followed by the quality of products or services (20%), the company's production potential (20%), and efficient distribution of products and services (16%). Market share and product characteristics are of secondary importance (6%).

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Source: own study

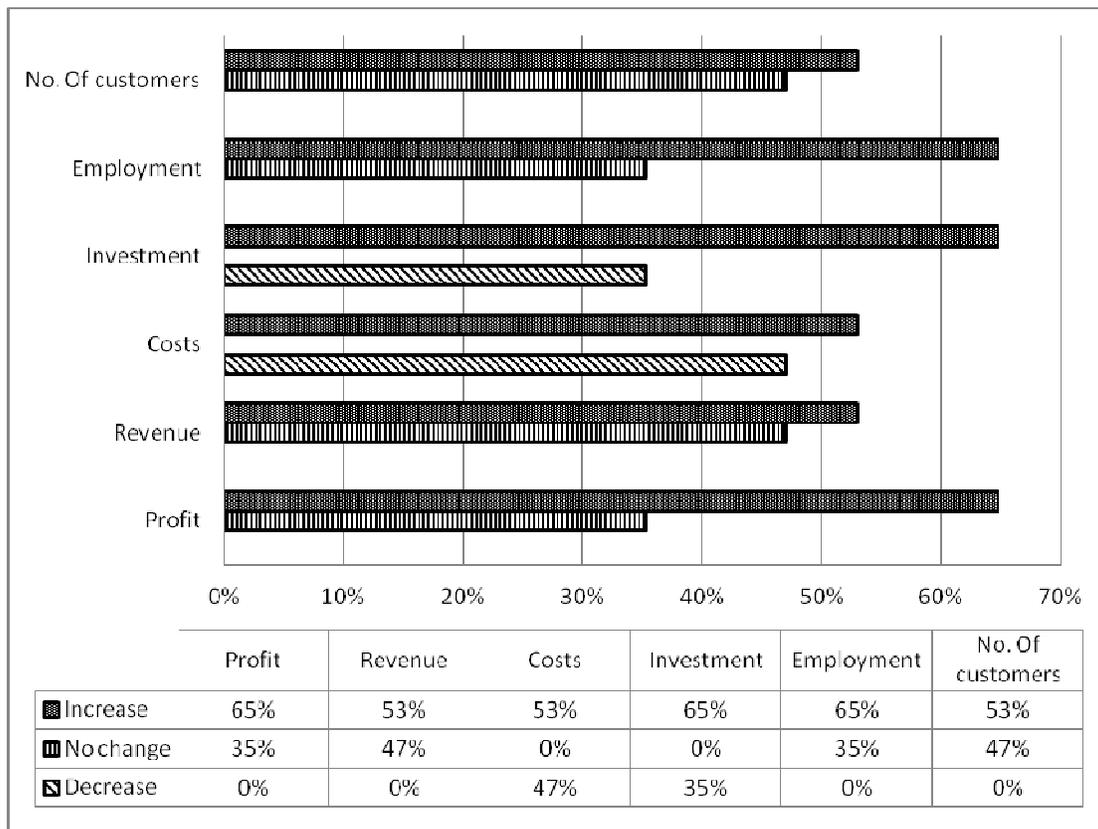
Fig. 1. **Factors determining company competitiveness - survey results**

Another key question the researchers focused on was whether belonging to the PSEZ has any influence on the development of a company whatsoever. Six variables were taken into account, determining the position of companies on the market. Researchers found that, beyond doubt, doing business in the PSEZ helped companies increase their revenue, make new investments, and increase employment (70%), while 51% of companies declared the increase in profit, the number of customers but also the cost of running a business.

The study shows that 40% of the companies managed to maintain a steady increase of their revenue and customer numbers, 35% managed to maintain a steady level of profits and employment numbers, 47% boasted reduction in running costs of their businesses, while 35% experienced a slump in new investment. None of the companies recorded a fall in their profit, revenue, employment or customer numbers. It can be concluded that as far as business running costs and new investments are concerned, their levels did not remain at the same level but

changed considerably after companies joined the PSEZ.

The following part of the study concerned the question of how training and obtaining qualified staff enhance company development. According to 40% of the respondents, it is fairly insignificant in that respect. Only 10% had a different view, and maintained that training employees and having skilled and qualified staff was essential. While 60% of respondents declared that belonging to the PSEZ was fairly beneficial for the functioning of their companies, 30% believed otherwise, claiming that the influence was insignificant. Only 10% were convinced that locating business in the PSEZ would guarantee success in their endeavours. When moving or setting up business in the PSEZ, the CIT/PIT (corporate income tax / personal income tax) tax exemption was the most important factor for 85% of the polled, and the property tax exemption proved the biggest incentive for the remaining 15% of the respondents.



Source: own study

Fig. 2 Factors that determine market position of production companies – survey results

Conclusions

The study shows that belonging to the PSEZ is an opportunity for production companies to develop faster and to become more competitive. What makes PSEZ particularly attractive to potential businesses is its favourable location in close proximity to the major transport routes, the availability of skilled workforce and the amount and type of new investment. The following were identified as the most significant factors inhibiting company development: red tape, competition, lack of qualified staff, and meagre demand for products and services. Most of the polled took advantage of bank loans in order to help develop

their companies. Respondents stressed that in order to limit bureaucracy, the PSEZ authorities should make allowance for new investors and guarantee a three-month "trial period". This proposal means that they would not be required to register their companies for three months, and, at the same time, would not have to pay high insurance premiums. If successful, the new regulation would reduce costs in case of business failure, and it would encourage more start-up businesses too. It appears that, for over 40% of the respondents, offering training opportunities to existing staff or obtaining new qualified employees is either moderately significant or insignificant.

Bibliography

1. Barański P., Krzyżak R., Mańkowski M., Modzelewska A., (2014). *The KPMG Guide to Special Economic Zones in Poland* (KPMG Przewodnik po SSE w Polsce), 21.
2. Kolczyński M., Wojtasik W., (2010). *Special Economic Zones and Clusters and their Innovative and Social Influence* (Innowacyjne i społeczne oddziaływanie specjalnych stref ekonomicznych i klastrów w Polsce), Towarzystwo Inicjatyw Naukowych, Katowice, Siudak P., Wątopek B., (2011). *Special Economic Zones in Poland* (Specjalne strefy ekonomiczne w Polsce), Państwowa Wyższa Szkoła Zawodowa im. Witelona w Legnicy, Legnica, 9.

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3. Michalcewicz-Kaniowska, M., Zajdel M. (2015). Development of the Kujawsko-Pomorskie Voivodeship in the light of Functioning of Economic Zones (Rozwój regionu kujawsko-pomorskiego w aspekcie funkcjonowania stref ekonomicznych), *Europa Regionum*, vol. 21, pp.151-162)
4. Michalcewicz-Kaniowska, M., Zajdel M. (2015). Development of the Kujawsko-Pomorskie Voivodeship in the light of functioning of Social Economy Entities - Study Results (Rozwój regionu kujawsko-pomorskiego w aspekcie funkcjonowania podmiotów Ekonomii Społecznej – wyniki z badań), *Europa Regionum*, vol.22, 87-95.
5. Michalcewicz-Kaniowska, M., Zajdel M. (2015). Social Cooperatives as Social Economy Actors in the Development of Entrepreneurship - Based on the Example of the Kujawsko-Pomorskie Voivodeship, *Yelgawa, Economic Science for Rural Development*, no 39, 227-235.
6. *Ministry of Economy*, (2015). Retrieved from <http://www.mg.gov.pl/Wspieranie+przedsiębiorczości+Wsparcie+finansowe+i+inwestycje/Specjalne+strefy+ekonomiczne/Obszar+SSE>, valid on 04.12.2015). The Polish Information and Foreign Investment Agency, (2015). Retrieved from http://www.paiz.gov.pl/strefa_inwestora/zachety_inwestycyjne_w_sse.
7. Official Journal of Laws, (2015). *The Law on Special Economic Zones*, item 282 (Ustawa o Specjalnych Strefach Ekonomicznych, *Dziennik Ustaw*; 2015 r. ustęp 282).
8. Trojak A, Wiedermann K, (2010). Shaping Economic Development of Regions in Poland and the Czech Republic (Special Economic and Industrial Zones Specjalne strefy ekonomiczne i strefy przemysłowe w kształtowaniu rozwoju gospodarczego regionów na przykładzie Polski i Czech), *Kraków-Warszawa*, 133.
9. Zuzek D., (2006), Small and Medium Companies as Being of Regional Entrepreneurship, (Male i średnie przedsiębiorstwa jako istota przedsiębiorczości regionalnej) In: *ActaAgrariaetSilvestri*, Vol. XLVI / 1 (EconomicSection), *Pub. Polish Academy of Sciences, Krakow*, 254 – 262.

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ECONOMIC ASPECTS OF BRAND IMPORTANCE AFFECTING THE OPERATIONS AND GROWTH OF ENTERPRISES – RESEARCH RESULTS

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Abstract. The primary objective of the paper was to research consumer preferences and factors affecting brand choice and to determine its impact on the operations and growth of an enterprise. Economic aspects of brand importance can be analysed both from the perspective of benefits reaped by both customers and enterprises. Customer satisfaction plays an important role in boosting the sales of goods, hence, in increasing a given enterprise's profits. Basing on the conducted survey, it was ascertained that brand loyalty significantly affected sales volumes. A branded product helps increase customer value – customers become the embodiment of the brand's promise. The brand is the source of information about the product, its qualities and calls up associations related to the branded product's benefits and attributes. The research also proved that the product's brand attracted customers. Consumers perceive branded products as those characterised by a higher quality and as a result choose them more frequently.

Key words: brand, consumer preferences, fizzy drinks, Malopolska province.

JEL code: M31

Introduction

In the contemporary world where the majority of goods and services are characterized by supply exceeding demand, a consumer can make a choice from product varieties and in consequence become more demanding. Hence, it is a skill for enterprises not only to produce but also to sell their products.

Given such fierce market competition, in order to maintain their market position enterprises must look for new competitive advantages. One of the most effective ways to obtain a competitive advantage is a strong brand. A brand is commonly perceived as a showcase of a product or enterprise, a recognizable mark that frequently evokes feelings and emotions. Those emotions and feelings can be positive if a branded product has delivered on its brand promise or quite the opposite – negative if the consumer is disappointed with the product and has no good associations with it.

The basic aim behind the research is the analysis of consumer preferences and factors affecting the brand choice and to determine its impact on the enterprises' operations and growth.

The following tasks were set in order to attain the main objectives:

examining determinants of the demand for fizzy drinks by analysing the price, ads,

consumers' financial situation and their education;

- 1) determining the most important factors affecting the selection of a given brand;
- 2) determining brand importance to consumers.

Both secondary and original sources of information were used in the paper. Its theoretical part was based on reference literature and data obtained from sources of mass information, statistical yearbooks and market reports.

In the empirical part, a survey was used as a research tool comprising 36 close-ended or semi-open ended single or multiple-choice questions and rating scale questions. The survey was divided into two basic parts: the first one comprised 32 questions and referred strictly to the topic of the research, while the other comprised four socio-demographic questions that allowed to characterise the research sample in regard of sex, education background and family financial standing. A group of 214 respondents were interviewed. The research sample was selected randomly. The survey was conducted in 2015. As regards the age of the respondents, the selection was purposeful in order to check which age group consumes the greatest quantity of fizzy drinks and to learn their preferences. The respondents were divided into three categories;

young people who, as a rule, like sweet beverages, students starting their own families who have grown to attach greater importance to health issues, and older persons who prefer a healthy lifestyle.

Results and discussion

1. The brand's economic role

Defining the concept of a contemporary brand is not an easy task. According to the American Marketing Association (AMA), a brand is a name, term, design, symbol, or any other feature intended to identify one seller's goods or service and to differentiate them from those of competitors (Keller K.L., 2011). According to the definition above, brand building is equal to the development of its graphic representation and a name, thus, it is perceived by many practicing managers as an element building awareness on the market. Apart from identifying a product or service offered by their provider as distinct from those offered by competitors, the brand has many more important functions which result in the following definition: "the brand is a combination of a physical product, a brand name, packaging, advertisement and associated activities pertaining to a price and distribution that, distinguishing a given manufacturer's products from competitive ones, helps provide consumers with distinctive functional and/or symbolic benefits, thus creating a loyal group of purchasers and allowing it to attain a leading market position" (Ambler T., 1999).

The brand can also be described as a sum of consumer experiences in the course of its usage (Pitcher A. E., 1985). From an economic perspective the brand is understood as a collection of benefits delivered by the product marked with a given identifier (Urbanek G., 2011).

Given the benefits stemming from the brand, its three basic functions can be distinguished (Altkorn J., 1998):

identity that helps distinguish the product from similar competitive products if there is a

certain group of such products – the brand can become their basic distinguishing feature;

a guarantee which means that a brand owner is obligated to maintain product quality at a specific level;

promotion – the brand becomes a promotional tool that should encourage prospective buyers to buy the branded product.

2. Methods of gaining competitive advantage based on a brand

Enterprises interested in good performance in their industry must have skills and resources that will allow them to gain competitive advantage. Competitive advantage can be defined as the enterprise's capability to satisfy customer's needs in a manner that is permanent and improved vis-à-vis its competitors and, in consequence, to gain above-average profitability (Urbanek G., 2002). Competitive advantage makes products stand out on the market. Other authors who take a similar theme are: Wielewska I., Sikorska D. (2006) or Zajdel M., Michalcewicz-Kaniowska M. (2015).

Gaining competitive advantage is particularly important because existing factors influencing competitive advantage such as low costs or innovative solutions are bound to lose their importance as it can be expected that product launch will soon lead to the appearance of the product's imitations or even its improved version. This is why the so-called "soft" skills and attributes have grown increasingly important, for example, marketing expertise, access to distribution channels and also the brand. In order to gain the advantage the enterprise must manufacture a product and build its image in a way that ensures its perception by a buyer as that characterized by "the highest quality" (Tkaczyk P., 2011). As it has been stressed numerous times, the brand is very important in the process of influencing consumers' opinions.

In order to gain for an enterprise a competitive advantage there must be analysed all measures taken by it and their relations. Such value chains allow to distinguish strategic areas

of their operations which should satisfy three basic conditions (P. Patkowski P., 2010):

- they must have qualities that lack competition, that is, they should result from attributes which the competitors lack;
- qualities and abilities thanks to which the enterprise stands out must be permanent and difficult to imitate;
- they must be the enterprise's exclusive value.

Thanks to the brand the enterprise's competitive advantage can be revealed in its marketing activities and distribution. Having a strong brand allows the enterprise to decrease costs related to making distribution channels available and helps decrease promotional expenses. Thanks to expanding the brand to include new products, the enterprise makes considerable savings related to costs of market launch. Moreover, thanks to the fact that brands store product detail, it is easier for customers to interpret them which influence confidence as regards purchasing decisions, and the perceived quality and associations can improve their satisfaction. As a result the enterprise can apply higher prices and benefit from higher profit margins on its products, thus gaining competitive advantage. Brand perception is vital to the brand's market success ensuring that it stands out against competitive brands; also the perception should help the brand meet customers' expectations and needs. Let us analyse how the elements specified above help build the brand's competitive potential (Patkowski P., 2010).

Brand knowledge is the awareness that a name or symbol exist and a potential customer's ability to determine that the brand belongs to a specific segment. Brand knowledge is a very important attribute of the brand's competitive potential because it serves as a basis for building its image and positioning. A recognizable brand evidences a strong market position and is frequently considered in the shopping process. Moreover, a recognizable and liked brand stands

a much better chance of winning buyers' heart even prior to their shopping experience. In the case of many sectors winning new customers is a lengthy and more expensive process than maintaining the existing ones. Winning the brand's loyal customers is one of more important determinants of its power and its competitive potential because (Patkowski P., 2010) it helps:

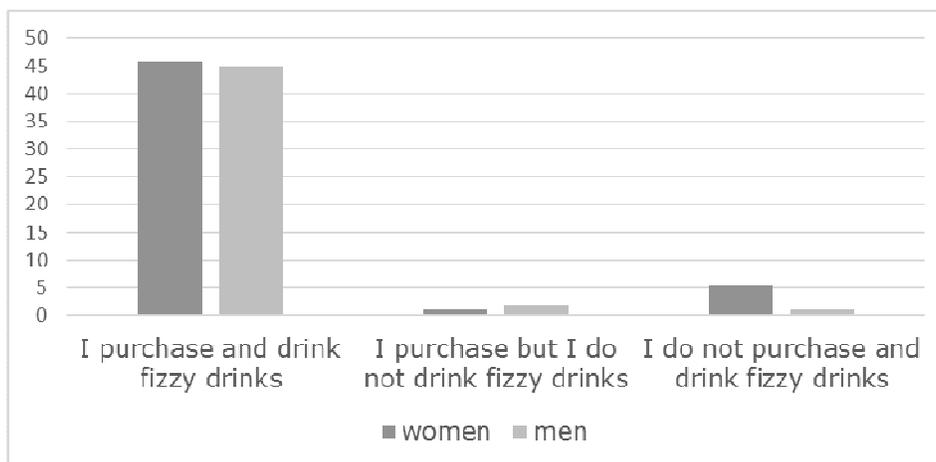
- decrease marketing activities' expenses;
- strengthen its position among distributors and distribution channels; loyal customers become a more reliable source of profits;
- attract new users; satisfied buyers build positive brand opinions and attract new customers;
- satisfied and loyal consumers are definitely less inclined to change brands acting on an impulse related to novelties of competitive brands;
- estimate sales and profits generated by returning loyal customers.

To recapitulate, it is worthwhile to emphasize that in order to gain long-lasting competitive advantage involving a brand, the brand should be effectively managed with the power of its capital used to the maximal extent. It is a complex and difficult task which can be supported by maintaining the brand's position, extending the brand to include other goods, ensuring the brand's presence on international markets, licensing and franchising the brand and its rejuvenation (Urbanek G., 2002).

3. The brand's importance against the background of empirical research of consumer preferences on the market of non-alcoholic beverages

The consumption of non-alcoholic carbonated beverages in recent years has been growing. Cola-type carbonated beverages are very popular both among children and adults. Respondents have different preferences regarding the size and type of packaging of a fizzy drink they select, a place of purchase, consumption frequency and

factors affecting the consumption of such beverages in their households.



Source: author's own studies

Fig. 1. Consumption of fizzy drinks [%]

The results of the survey show a high rate of the consumption of fizzy drinks. Figure 1 shows that nearly 91% of respondents declare that they buy and consume such beverages. In this case, sex was irrelevant as the division was equal. Compared to women, men more frequently declare that they consume those beverages as in the group of 14 non-drinking and non-buying respondents there were as many as 12 female respondents. The most frequent reason for the above was a statement made by all respondents in that group that the beverages in question were not healthy. Other reasons for the respondents' choice are a high number of calories, a damaging effect on the stomach and malaise after the consumption.

Most frequently fizzy drinks were consumed by the respondents a few times per week or month, regardless of sex. Differences are visible as regards the daily consumption rate: men account for 15% out of 21% of respondents. Among 110 of female respondents, 8 consume fizzy drinks less than once a month. The study group also included six respondents who buy such beverages but do not drink them – they buy them for their guests. It could be ascertained that the respondents drink fizzy drinks very often.

The most frequent factor affecting the consumption rate of fizzy drinks were preferences

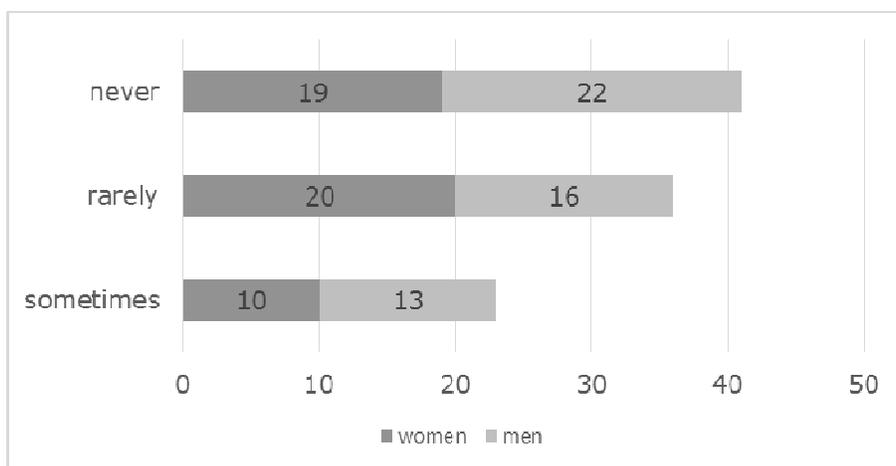
of household members – such answer was mostly indicated by women in the 19 – 35 age group; the above can evidence that women, being responsible for daily or weekend shopping, buy fizzy drinks preferred by other household members. In the case of men, taste and habits were the factors that had the greatest impact on their consumption of such beverages. The highest percentage of the respondents subscribing to the statements above was represented by young men, who are probably emotionally attached to their favourite beverages as they like sweet soft drinks. However, also a large number of adult male respondents chose those answers. Taking into account the respondents' financial situation, it could be noticed that people in a very good or good financial situation are mostly guided by their household members' preferences and consume carbonated beverages out of habit, whereas in the case of the respondents whose financial situation is not good, the beverages' affordable price is a crucial consumption-related factor.

There are many distribution channels of fizzy drinks on the market, however, grocery stores, super- and hypermarkets play the most important role to the respondents. The study group (men and women alike) most often purchased those beverages at grocery stores. Those indications may suggest that the

consumers buy the beverages during their daily grocery shopping at stores located close to their residence, or to satisfy an instant craving as the 330 ml packaging is the most frequently chosen one. A small percentage of the respondents state that they most frequently buy carbonated soft drinks at outlets offering such drinks at the lowest price, including 58.82% of male respondents, which may evidence that they tend to economize on such items. 3% of the respondents indicated "other outlets" for their purchases, including vending machines.

The respondents were asked to specify whether they happened to buy the beverages

based on trends, ads or acting on impulse (Figure 2). None of the respondents specified that it happened very often. The largest group of the consumers declared that they never made inconsiderate choices and did not follow trends (22% of male respondents and 19% of female respondents). Women tend to be more frequently guided by advertisements or to make purchases on impulse or based on a trend regarding a given soft drink, however, it happens rarely. Young men aged 19-35 are more frequently inclined to make purchases of the beverages based on ads.



Source: author's own studies

Fig. 2. Consumption of fizzy drinks [%]

A definite majority of respondents (74%) prefer fizzy drinks in PET bottles (mostly 1.5 l), including 85% women who account for nearly 83% of respondents in the 19-35 age group. Also the group of respondents choosing 330 ml canned soft drinks is large, including 69.23% of male respondents (72.22% of young men).

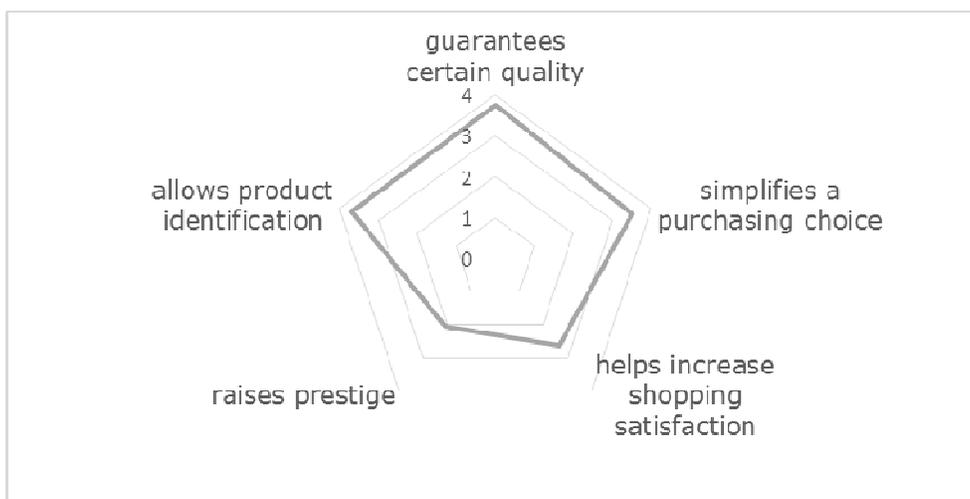
The next question pertained to the selected packaging; the study group was asked to rate necessary qualities of goods packaging using a 1-5 scale. From among the qualities listed the respondents rated the "easy to open and close again" quality as the most important one – on average that quality scored 3.82 (as many as 67% of the respondents rated that quality at 4 or 5).

The quality of the "type of the manufacturing material" was rated as relative unimportant and scored 2.25 on average and so was the packaging's reclaiming possibility – average at 2.31. The definite majority of consumers realize that Cola-type soft drinks are not healthy and they are aware of their effects on health. In the group of 20 respondents claiming "yes", 70% of the respondents were aged below 18. Unfortunately, they are also unaware of Cola's effects on health as 46.15% of respondents from that age group chose the "yes" answer. Based on the presented research results, it can be noticed that young people are not interested in what they choose to drink and whether it is good for their health. Perhaps they are only guided by taste and believe that the sweeter the beverage the

better for them because it is more tasteful. Despite the fact that the number of the respondents aged 19-35 answering "no" was the highest (83.33%), that age group was the one that most frequently let their children drink Coca Cola. It is a certain paradox as adult consumers who are aware of its negative effect on people's health, let their children drink such beverages. Coca Cola also has a healing effect and is treated as a remedy for stomach problems, of which 76% respondents were aware, including 45% of

respondents who served their friends Coca Cola specifically for that purpose.

There are branded and unbranded (white label) beverages on the market of fizzy drinks. As a rule, branded beverages are more expensive and that can prove their higher quality. Thirst quenching is the beverages' primary function, however, as regards a favourite brand the preferences of the study group are mostly connected to its taste. Hence, it proves that they are loyal to the selected brand.

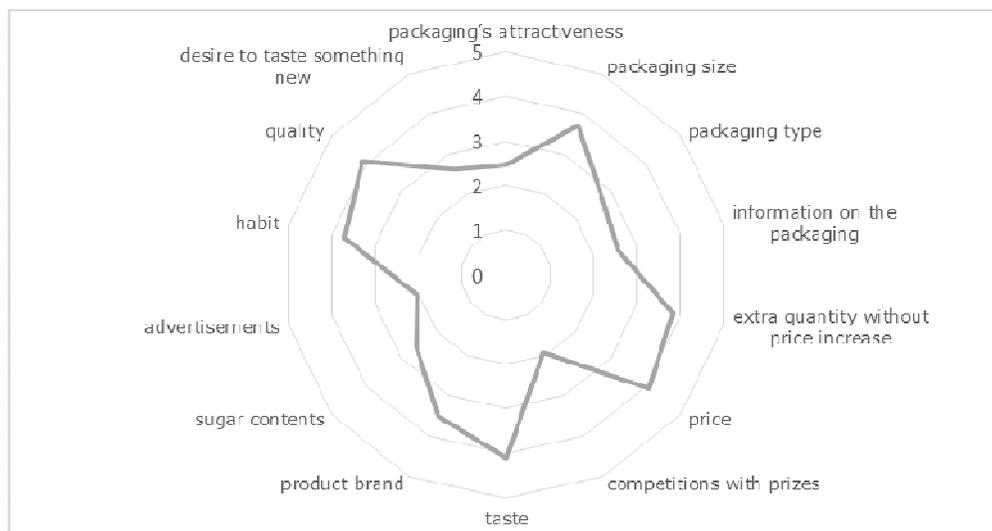


Source: author's own studies

Fig. 3. Average rating of brand importance to consumers purchasing fizzy drinks on the 1-5 scale (where 1 = important and 5 = very important)

The respondents were requested to rate the importance of the fizzy drinks brand on the 1-5 scale (Figure 3). The guarantee-related function of the brand scored the highest number of points – it was rated at 4 or 5 by 67% of respondents. Also product identification (3.68 on average) as well as simplification of purchasing decisions

(3.52 on average) turned out to be quite important. According to the study group, the brand's function of raising consumer prestige and shopping satisfaction were the least important (the former was rated by 15% of respondents at 4 or 5).



Source: author's own studies

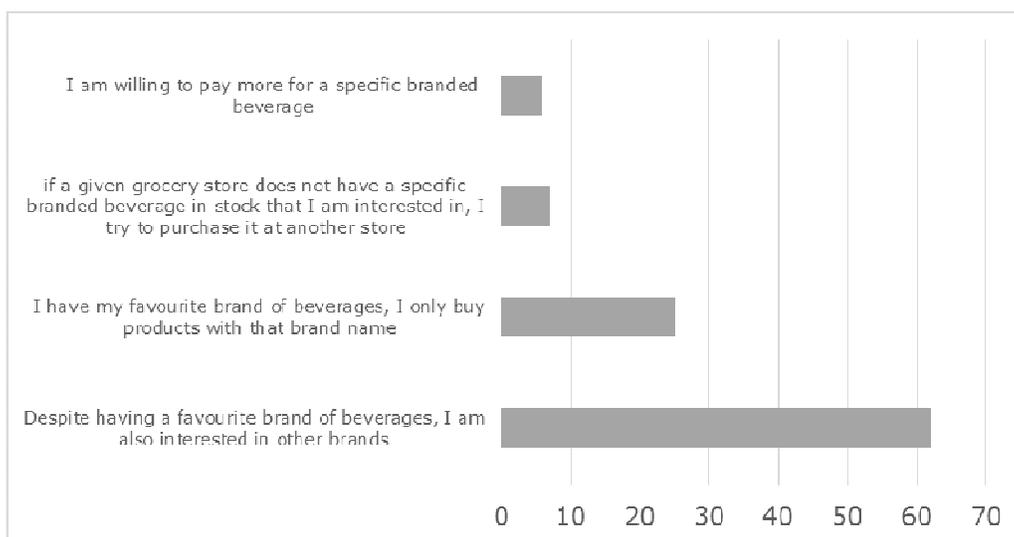
Fig. 4. Average rating of the impact of specific factors on the choice of a specific fizzy drinks brand on the 1-5 scale (where 1 = important and 5 = very important)

As part of the next question the respondents were asked to rate the relevance of the factors specified while choosing a specific brand also using the 1-5 scale. The distribution of answers was in this case quite diverse. It is worthwhile to notice that the highest percentage of the respondents select a brand based on proven quality rated by 80% respondents at 4 or 5 (4.1 on average). The beverage's taste and price also matter to the respondents and extra free quantity was rated at 4 or 5 by 59% consumers.

Competitions with prizes turned out to be the least important - only 13% of the respondents rated that factor at 4 or 5. Also the factors such as advertisements (2.02 on average), attractive packaging (2.46 on average) and information on the packaging (2.56 on average) were insignificant for consumer choices.

To obtain details regarding the respondents' brand loyalty on the market of soft drinks, the study group was tasked with indicating one of

four opinions to which they subscribe to the greatest extent (Figure 4). The statement: "despite having my favourite brand, I am also interested in other brands" was the most frequently chosen one (62% of respondents), whereas only 6% of the respondents stated that they were able to pay more for a given beverage brand compared to other brands. Young consumers up to 18 years old are the most loyal as in that group the highest number of respondents subscribed to the following statement: "I have my favourite beverage brand and buy only products of that brand". Based on the research results it can be concluded that consumers are open for products of other producers of fizzy drinks and are not willing to pay more for their favourite branded beverage.



Source: author's own studies

Fig. 5. Consumers' opinions on brand loyalty [%]

Taste turned out to be the most important factor affecting the choice of a given brand to the study group. In the respondents' opinion, regardless of their educational background, the beverage's quality was important. Based on the data collected after the survey, the price is also an important factor affecting the purchase of a given brand that was indicated by 29% of the respondents from among eight proposals presented in the survey. The price mostly matters to the respondents with basic education who do not have their own source of income because they continue to study.

Conclusions

Entrepreneurs engage in a number of activities aimed at convincing prospects that their products are unique. Consumers have different preferences pertaining to the type and size of the packaging of fizzy drinks selected by them, the place of purchase, the frequency of the consumption of such beverages and factors affecting the consumption at households.

Entrepreneurs should see their opportunity in boosting sales to young people and should come up with products targeted at young people who can be reached mostly through promotion tools, e.g. ads in magazines for the youth or social media. Ads in the sector of non-alcoholic

beverages are used most frequently and the research shows that they are most often remembered by respondents. They also play a significant role in brand building.

The research suggests that enterprises should also engage in intensive forms of distribution merchandising their products in nearly all sales outlets, and they should extend the sales of beverages in small and handy packaging. The results of the research show that customers most frequently buy Cola-type products to quench their thirst and that they get them mostly at grocery stores during their daily grocery shopping; the preferred packaging size is 330 ml.

Brand preferences of the respondents belonging to the study group are mostly fuelled by taste and a belief that the branded products' quality is higher. Apart from taste and perceived quality, also the price and sales promotion tools used such as extra quantity available free of charge and competitions with prizes play an important role in the opinion of the respondents, whereas the factors such as attractive packaging and information on the packaging are hardly relevant when it comes to choosing a given brand. Also product identification and simplification of purchasing decisions quite matter to the respondents.

The brand helps identify product qualities and indicates benefits stemming from the purchase. Considering brand importance from the marketing perspective, attention must be paid to the buyers. Customers respond to marketing activities very differently. It is possible to succeed if "opinion leaders" are reached who actually influence the development of beliefs among specific social groups. Thanks to brand loyalty of those who can influence others and thanks to skilfully chosen forms of promotion, consumers' engagement can be increased. It is very important from the perspective of customer loyalty, because the brand makes the customer attached to a given product and enterprise.

Apart from boosting sales through the brand, enterprises also reap other fundamental benefits.

The brand ensures that the enterprise can make regular profits and is a protection against competition. It helps gain competitive advantage. Branding enables the enterprise to influence customer's confidence as regards purchasing decisions, become familiar with and remember more product details, whereas the perceived quality helps increase satisfaction with product usage. That, in turn, allows to stabilise existing and future profits and secures future incomes. However, it should be emphasized that in order to stabilize profits, the enterprise branded product must meet customers' expectations and be tailored to a specific customer segment. To that end, one should foster customer brand loyalty and implement brand loyalty programmes.

Bibliography

1. Ambler, T. (1999). *Marketing Od A do Z (Marketing from A to Z)*, Wydawnictwo Profesjonalnej Szkoły Biznesu, Krakow, pp. 337-338
2. Altkorn, J. (red.) (1998). *Podstawy marketingu (The Basics of Marketing)*, Instytut Marketingu (The Marketing Institute), Krakow, pp. 153-154
3. Keller, K.L. (2011). *Strategiczne zarządzanie marką (Strategic brand management)* Oficyna Wolters Kluwer Polska, Warsaw, p. 20
4. Patkowski, P. (2010). *Potencjal konkurencyjny marki. Jak zdobywać przewagę na rynku (Brand's Competitive Potential. How to Gain a Competitive Edge on the Market?)*, Poltext, Warsaw, p. 71
5. Pitcher, A.E. (1985). *The Role of Branding In International Advertising*, International Journal of Advertising, 4, pp. 241-246
6. Urbanek, G. (2002). *Zarządzanie marką (Brand Management)*, Wyd. PWE, Warsaw, pp. 15-17
7. Urbanek, G. (2011). *Wpływ marki na wartość dla akcjonariuszy na przykładzie wybranych spółek notowanych na WGPW (Brand Impact on Shareholder Value Based on the Example of Selected Enterprises Quoted at the Warsaw Stock Exchange)*, Marketing i Rynek, 8, p. 29
8. Tkaczyk, P. (2011). *Zakamarki marki. Rzeczy, o których mogłobyś nie wiedzieć, zapomnieć lub pominąć podczas budowania swojej marki (Brand Secrets. Things that Can Be Potentially Ignored, Forgotten or Skipped in Brand Building)*, Helion, Gliwice, p. 32
9. Wielewska, I., Sikorska, D. (2006). *Determinants of Development of Competitiveness in Agricultural Enterprises (Uwarunkowania rozwoju konkurencyjności w przedsiębiorstwach agrobiznesu)* (w:) Agrobiznes 2006. Konkurencja w agrobiznesie – jej uwarunkowania i następstwa, S. Urban (red.), Wydawnictwo Akademii Ekonomicznej we Wrocławiu, Wrocław, vol. 2, pp. 476-480
10. Zajdel, M., Michalcewicz-Kaniowska, M. (2015). *Social Cooperatives as Social Economy Actors in the Development of Entrepreneurship - Based on the Example of the Kujawsko-Pomorskie Voivodeship*, Jelgava, Economic Science for Rural Development, No 39, p 227-235

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UNEMPLOYMENT PROBLEMS IN THE REGIONS OF LATVIA

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TURIBA

Abstract. In the regions of Latvia, there are vacancies, but at the same time there is unemployment and employers have problems in finding employees for their companies.

The main aim of this research is to evaluate unemployment situation in the regions of Latvia. In the research, there will be characterised unemployment specifics in the regions of Latvia, inhabitant economic activity level and distribution by economic activity, as well as education level of unemployed people. During research there will be drawn conclusions and developed proposals for objective evaluation of unemployment situation and for improvement of remuneration in the regions of Latvia.

Keywords: regions, unemployment, inhabitants, job seekers, labour market.

JEL code: E24

Introduction

The decrease in population and society ageing, regarding the fact that inhabitants retire later, is a substantial problem in the field of employment and unemployment not only in the European Union, but also in Latvia. The number of inhabitants of Latvia continues to decrease – from 2044813 on January 1, 2012, to 1986096 on January 1, 2015, which means a decrease by 58717 people or approximately 2.87% in four years. Meanwhile, the number of unemployed people in Latvia was 155.1 thousand on January 1, 2012 and 107.6 thousand on January 1, 2014, which constituted a decrease of 30.63%. It significantly impacted labour market. The minimum salary in Latvia was increased from EUR 320 to EUR 360, but since January 1, 2016 it is EUR 370. This salary increase is felt by only those who have minimum salary. Therefore, for Latvian companies, it becomes more and more problematic to retain qualified labour force if their salary is not increased and when their requirements keep increasing. Larger salaries are paid to middle and higher level managers. In general, the state lacks qualified specialists.

Labour costs in Latvia are among the lowest in the EU Member States. In 2014, the labour costs per one employed in Latvian economy in total were 38% of the EU average, incl. manufacturing industry – 31.4% of the EU average. Nevertheless, there were some small improvements – in the period from 2011 to 2014, the labour costs decreased by nearly 6

percentage points. By the productivity indicator, the overall retardation of Latvia from the EU average decreased by 4 percentage points, while the manufacturing retardation decreased by 3 percentage points.

There were also larger improvements. Since the end of 2010, the remuneration increase renewed, though the unemployment level maintained at a relatively high level. With the increase in demand for labour force, the average gross remuneration has steadily been rising. In 2012 and 2013, it rose by 3.8% and 4.5% correspondingly, but in 2014 – by 6.8%, reaching EUR 765. A sharp remuneration increase took place also in 2015 – during the second quarter the average gross salary increased by 6.9%, compared to the corresponding period in 2014, reaching EUR 815. The highest remuneration remained in Riga region (EUR 921), while the lowest was in Latgale region (EUR 560). In the second quarter, 2015, the remuneration in the private sector increased by 7.8% and in the public sector – by 5.3%. Meanwhile, it should be noted that, in the second quarter of 2015, the average gross salary in the public sector was only by 6.2% higher than in 2008, while in the private sector it exceeded the level of 2008 by nearly 28%. The most significant remuneration increase has been in the real estate sector, trade and state administration. The most significant remuneration increase, if compared with the second quarter of 2014, was in the information and communication service sector (by 9.7%),

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real estate sector (by 9.4%) and hospitality and catering sector (by 9%). With the increase in the nominal remuneration, the real wages also kept gradually increasing. In the period 2011–2012, with the growth in consumer prices, the real wage increase was moderate – 0.1% and 1.6%, correspondingly. More dynamic increase in real wages was observed from 2013 to 2014. In 2013, the real wages increased by 5.6% and in 2014 – by 8%. In the second quarter of 2015, the real wage level was by 6.6% higher than a year before. The real wage growth during the recent years was mostly due to the sharp increase in nominal salary, and to less extent – the changes in consumer prices. (Informativais ziņojums par makroekonomisko situāciju valstī, 2015). The Ministry of Finance forecasted that the average gross salary in Latvia could be EUR 840.8 in 2016.

The remuneration levelling-out is an objective process to be taken into account in future. With the increase in minimum salary, there may be a sharper rise in wages. Therefore the entrepreneurs may have an increasing wish to retain highly-qualified employees, which would lead to decrease in unemployment. The increase in remuneration can serve as a stimulus for innovation and investment, acquisition of new technologies to increase productivity of production resources, to raise work productivity and to cut expenses. It may also create negative impact on competitiveness.

Based on the labour market-related research carried out at the end of 2014, there can be distinguished the main challenges regarding the lack of qualified specialists and labour force in general in the country. The research data show that currently the main labour force-related challenges are the lack of qualified specialists (37%) and the lack of labour force in general due to the impact of the EU free market and emigration for labour purposes (10%), which correlates with the previously described economic and demographic situation in the country.

Further, according to the times mentioned, follows the lack of employee motivation (6%) and the increase in employee requirements, e.g. remuneration, additional benefits (5%). Analysing data in smaller socio-demographic groups, it can be seen that the lack of qualified specialists as the main challenge has most often been mentioned by managers of manufacturing companies, as well as those of medium and large companies (50+ employees). The general lack of employees has been mentioned as the main challenge by managers of manufacturing companies. The managers of manufacturing companies state also the specifics of the sector (hard, stressful and hardly predictable work) as a significant challenge (Kanejeva, 2014).

According to the report of the Ministry of Economics on the macroeconomic situation in the country it can be concluded that, with the improvement of economic situation in the country, there may be observed positive trends in the labour market – decrease in unemployment and increase in employment. At the same time, the dynamics of improvement become slower, influenced by the decrease in economic growth rate which is linked to the trends in the external environment. In 2014, the situation in the labour market continued to improve, though slower than before. The unemployment level decreased to 10.8%, which was by 1.1% less than in 2013, but the employment level increased by 9% - to 59.1%. In 2014, there were employed 884.6 th. people, while the number of jobseekers was 107.6 thousand, which was by 12.7 thousand less than in 2013. In 2014, the number of economically active inhabitants also continued to decrease – by nearly 22 thousand people or 2.2% if compared with 2013. It should be mentioned that the trend of decrease in the number of economically active inhabitants has maintained since the beginning of 2013. Nevertheless, the level of economic activity of the inhabitants increased in 2014 by 0.3% and reached 66.3% in

the age group from 15 to 74. In the second quarter of 2015 the employment level increased by 1% if compared with the corresponding period of the previous year. Though the employment increase has been the sharpest within the recent year and a half, it still significantly lags behind the employment increase dynamics of 2012 and 2013. In total in second quarter of 2015, there were employed 898.2 thousand people or 60.9% of the inhabitants in the age group from 15 to 74. If compared with the second quarter of 2014, the employment level increased by 1.5%. The unemployment level in the second quarter of 2015, if compared with the corresponding period in 2014, decreased by 0.9% - to 9.8%. At the same time, if compared with the previous period, the unemployment level decreased by 0.5%. The level of registered unemployment also continues to decrease. At the end of August, 2015, it decreased to 8.5%. There were registered 79.8 thousand unemployed people, which was by 1.1 thousand less than in August, 2014. The highest registered unemployment level maintained in Latgale region (18.4%) and the lowest - in Riga (5.1%). Nearly one third of the total number of registered unemployed were long-term unemployed (jobless for more than a year). Comparatively high unemployment level is mainly connected to other cyclical factors, though the structural unemployment risk also maintains high. Part of current unemployed people may have lengthy problems in finding a job as the new workplaces are not the same as lost during the economic crisis. At the same time a substantial problem is regional disproportionality of the labour market - jobs and labour resources are not distributed evenly among the regions.

The number of employed continues to grow slowly. The number of employed people in 2012 was 875.6 thousand, in 2013 - 883.9 thousand and in 2014 - 884.6 thousand.

The situation in the labour market is improving. According to the research carried out by the Ministry of Economics, the employment

was forecasted to increase to 889 thousand in 2015. In 2016, the number of employed people could increase to about 894 thousand or by 0.6%, if compared to 2015. The employment level could surpass 61%, while the unemployment level would decrease to 8.7%.

In general, both in 2015 and 2016, the largest growth in employment was expected in the sectors targeted at the domestic demand - commercial services sector, construction and trade. The increase in the demand for labour force would also maintain in manufacturing, but it would be slower than previously.

According to the forecast of the State Employment Agency, the unemployment level was expected to be 10.1% in 2015 and 9.5% in 2016.

According the research of the Central Bureau of Statistics, the data evidence the decrease in unemployment level, yet there is a misbalance in labour force supply and demand - companies lack employees, but the unemployed people lack the necessary qualifications. On the labour market, currently, there is demand in those professions where employees need a higher education level than the secondary education. At the same time, most of the unemployed people previously were employed in the basic jobs (handymen, sellers, cleaners, street-sweepers, etc.), where the education level does not have constitutive significance. Therefore, qualification development promotion is needed, as well as acquisition of new skills, within these unemployment groups. Additionally, it should be noted that there are new requirements even for basic jobs, determined by the development of technological processes.

The research includes the period 2012-2014 and also looks at the highlights of 2015.

The **aim** of the paper is to evaluate the unemployment situation in the regions of Latvia. Therefore, the **tasks** are:

- 1) to characterise unemployment specifics in the regions of Latvia;

- 2) to research economic activity level of inhabitants and their distribution by economic activity;
- 3) to evaluate the changes in the number of unemployed people by the level of education in the regions of Latvia.

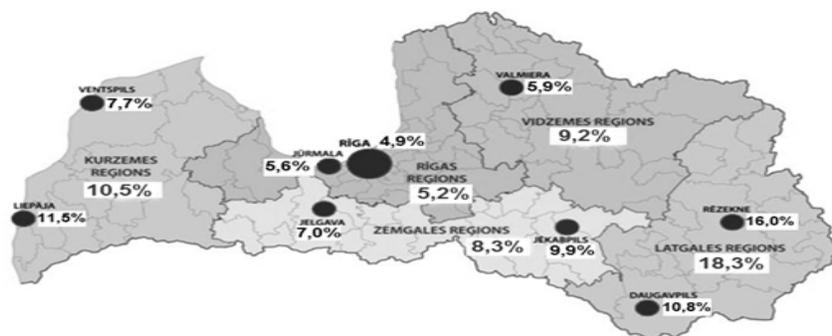
The study is based on the national statistical data and the State Employment Agency (SEA) data analysis. The following research methods were used monographic and statistical analysis research methods. The study focusses on the evaluation of the levels of unemployment and economic activity, distribution of inhabitants by

economic activity, and distribution of unemployed people by education level in Latvian regions.

Keywords: regions, unemployment, inhabitants, jobseekers, labour market.

Discussion and results

In the National Development Plan of Latvia for 2014-2020, one of the action plan tasks is connected with promotion of unemployed people competitiveness and access to labour market, by providing access to motivation competence increase, skill improvement, education and social support services.



Source: authors' construction based on SEA data

Fig. 1. Registered unemployment level in Latvia in November, 2015

The higher registered unemployment level in November, 2015, was still in Latgale region – 18.3%, which was by 10% lower than in all regions on average; by 9% lower than in Zemgale region, by 9.1% lower than in Vidzeme region, by 7.8% lower than in Kurzeme region and by 13.1% lower than in Riga region (see Fig. 1).

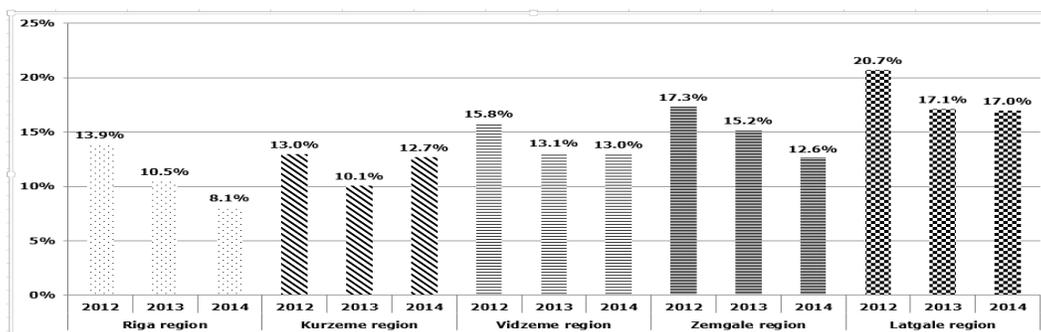
On November 1, 2015, SEA had registered 78052 unemployed people, the number of which had decreased by 505 people if compared with the beginning of the same month. In October, 2015, the unemployment rate was the lowest since 2008. If compared with the corresponding period of the previous year, the unemployment rate had decreased by 1131 people or by 1.4%.

The majority of the SEA registered unemployed people were in the following

professions – shop assistants and their handymen, hotel and other premise cleaners as well as unclassified workers. In October, 2015, the largest demand for workforce was in wholesale and retail, manufacturing, state administration and social security sectors.

According to the SEA data for the 10 months of 2015, the number of unemployed people who had participated in any of active measures was 19,304 people or 32.5%, and the number of people who had found job by October, 2015, was 59,429 people.

Evaluating the unemployment level in Latvian regions in the period 2012-2014, the largest yearly unemployment was in Latgale region – 20.7% in 2012, decreasing by 3.6% in 2013, and falling to 17% in 2014.



Source: authors' construction based on CBS data

Fig. 2. Unemployment level in the regions of Latvia (2012-2014)

In Riga region, comparing 2014 to 2012, the unemployment had a decrease trend, as within this period it decreased by 5.8%. In Kurzeme region, the unemployment decreased by 2.9% between 2012 and 2013, while it rose again by 2.6% in 2014. In Vidzeme region, the unemployment decreased by 2.7% from 2012 to 2013, and further by 0.1% in 2014. In Zemgale region, the unemployment was by 2.1% lower in 2013 than in 2012. In 2014, the decrease was by 2.6%, which was the largest decrease in Latvia in the period from 2013 to 2014. In Latgale region, there was a significant decrease by 3.6% from 2012 to 2013, and it decreased further by 0.1% in 2014.

Regarding the income per capita, the lowest income - up to EUR 284 was in Zemgale and Latgale regions, up to EUR 426 in Vidzeme region, up to EUR 568 in Latgale region to EUR 710 in Riga, up to EUR 1136 in Kurzeme region, from EUR 1420 to EUR 1704 in Riga.

In Latgale, more than 50% of inhabitants work in agriculture, forestry or fishery sectors, 10% in wholesale and retail; 10% in car service, 8% in transportation and storage, approximately 6% in construction, about 6% in catering services, and the rest 10% in other sectors.

According to SEA survey results, the employers in Kurzeme region most often (in about 27% of cases) had not concluded written labour contracts with their employees, while the corresponding figures were 3.9% in Riga, 10.1% in Zemgale, and 10.6% in Latgale region. In

Latvia, about 26.2% of labour force were employed only part-time.

The largest lack of unqualified employees was seen in Kurzeme region – 28.6% and in Latgale region – 27.3%, while the smallest in Riga – 8.7%. At the same time, low-qualified workers were the most needed in Vidzeme region (33.3%), and highly-qualified workers (87%) – in Riga region.

In Latgale region, unemployed people do not want to work for the minimum salary for private entrepreneurs, though jobs are available near their residences. Such approach is the most common in Latgale region – 24.2%, as well there was the largest number of people living alone – approximately 17.1%.

The employers most often search to fill vacancies with the help of relative, friend or acquaintance recommendations – 70.2% for unqualified employees, 76.8% for low-qualified employees, 67.7% for highly-qualified employees.

The next most popular way of searching for employees is advertising on the Internet – 41.2% for highly-qualified employees, followed by SEA services – 25%, advertising in radio, TV and press – 33.3%. In 43.7% of cases specialists were invited from other enterprises. Regarding cooperation with traineeship companies, the vacancies were filled by offering traineeships to people without qualification - 12.2%, 15.7% - low qualified employees and 19.3% - highly qualified employees. In Latgale region, internal migration is quite common.

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In Latgale region, people become jobless most often due to incompliance with discipline, because of inability to work in team and on their own, unwillingness to undertake responsibility and initiative, insufficient skills to adapt to new conditions and make independent decisions.

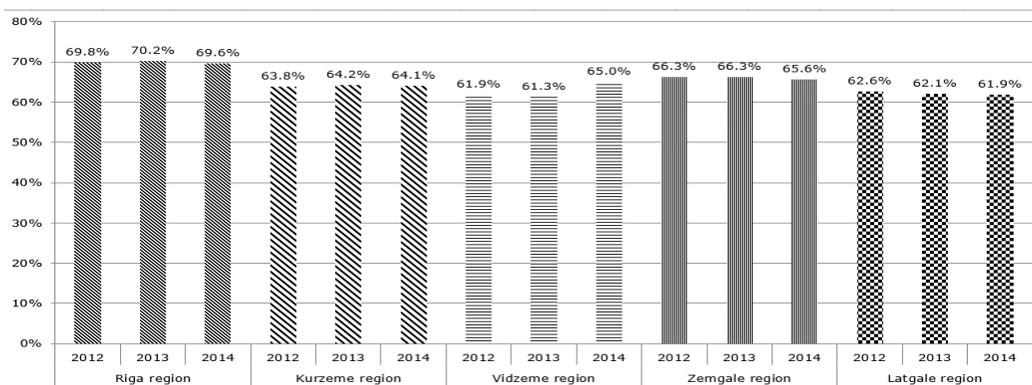
Economically active inhabitants – people of both genders who within the period of review offer their labour for production of material goods and for provision of services. Economically active inhabitants contain employed people and job-seekers (both registered and unregistered by SEA), who are seeking for jobs. (CBS, 2015)

The inhabitants are divided into economically active, which is the majority in Latvia with the trend to decrease – in 2012 the number was 1030.70 thousand people, in 2013 – 1014.20

thousand, in 2014 – 992.30 thousand or about 3.7% less than in 2012.

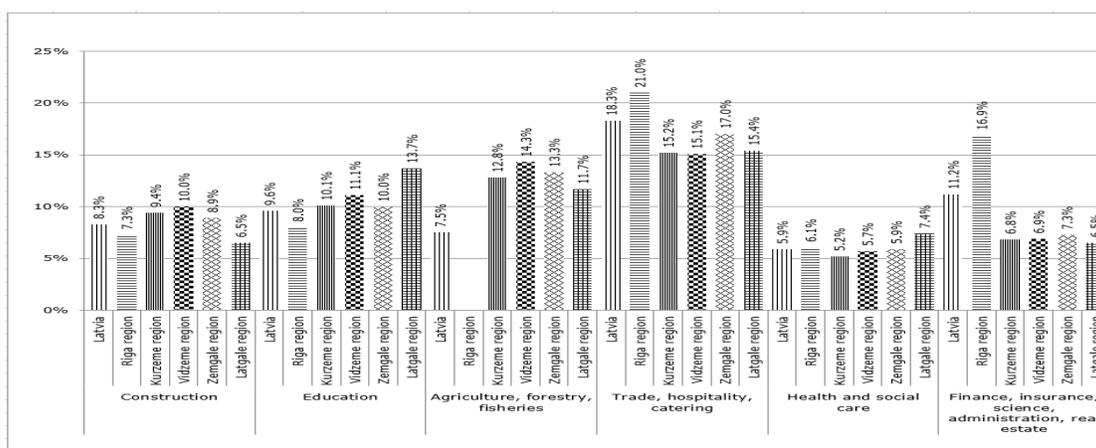
The number of employed people is changeable – in 2012 the number was 875.6 thousand, in 2013 – 893.9 thousand and in 2014 – 884.6 thousand people, meaning an increase of 1.3% in comparison with 2012, and a decrease of 1.04% in comparison with 2013.

The number of unemployed people in 2012 was 155.1 thousand people, in 2013 – 120.4 thousand people, in 2014 – 107.6 thousand people, with a decrease trend if compared with 2012. Starting with 2014, there is a decrease by 30.63%. Regarding economically inactive inhabitants, the number of which was 529.3 thousand people in 2012 and 503.5 thousand people in 2014, there was a decrease by 4.88%.



Source: authors' construction based on CBS data

Fig. 3. Levels of economic activity in the regions of Latvia (2012-2014)



Source: authors' construction based on CBS data

Fig. 4. Distribution of inhabitants by economic activity in the regions of Latvia

At the same time, referring to Fig. 3, the change trend by economic activity in regions was similar. Comparing 2012 to 2014, there was a

small decrease in Riga, Latgale and Zemgale regions, while there was a small increase in Kurzeme and Vidzeme regions.

Regarding research on the distribution of inhabitants by economic activity in regions (see Fig. 4), it can be seen that in Vidzeme region the largest number of employed was in construction, while this sector had the least employment in Latgale region. The least employment in education was in Riga region. In the sectors of agriculture, forestry and fisheries, the largest number of employed was in Vidzeme region, the least – in Latgale region, while the sectors had no employed in Riga region. In the sectors of trade, hospitality and catering services, the largest number of employed was in Riga region, the least – in Vidzeme region. In the sectors of health and social care, the largest number of employed was in Latgale region, the least – in Kurzeme region. In the sectors of finance, insurance, science,

administration and real estate, the largest number of employed was in Riga region, the least – in Latgale region. With respect to Latvia as whole, the largest number of employed was in trade, hospitality and catering services – 18.3%, while the smallest number is in health and social care – 5.9% of all employed in 2014. Analyzing the data depicted in Table 1, it can be seen that the number of vacancies in the period from 2012 to 2014 on average increased in Riga, Kurzeme and Vidzeme regions, while decreased in Latgale and Zemgale regions.

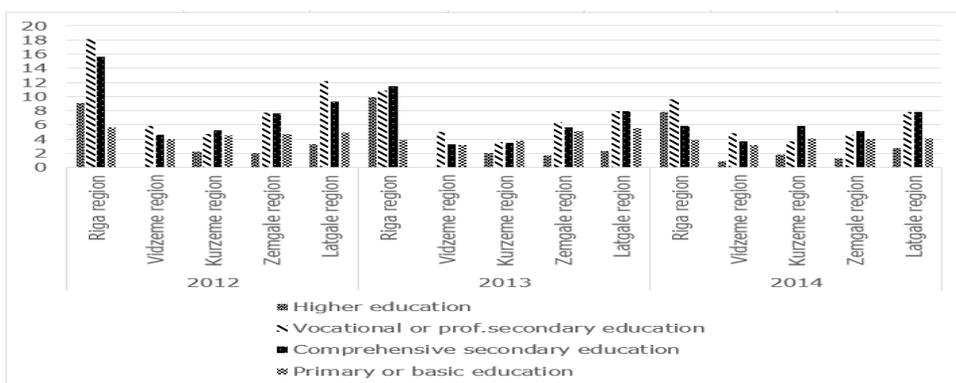
There was also carried out a research on distribution of unemployment by education level in Latvian regions (see Fig. 5).

Table 1

Number of vacancies in the regions of Latvia – yearly average

Region	2012	2013	2014
Riga region	2467	3592	3978
Kurzeme region	302	361	468
Latgale region	336	562	456
Vidzeme region	332	349	411
Zemgale region	374	366	337
Total in Latvia	3811	5230	5650

Source: authors' construction based on SEA data



Source: authors' construction based on CSB data

Fig. 5. Distribution of unemployed in the regions of Latvia, th. of people

Regarding the unemployed people education levels in the period from 2012 to 2014, the data are variable. The largest number of unemployed with the higher education was in Riga region, while in Vidzeme region there were no registered unemployed with the higher education. Regarding

comprehensive secondary education, the largest number of unemployed in 2012 and 2013 was in Riga region, but in 2014 - in Latgale region. Regarding the basic or primary education, the most of unemployed in 2012 was in Riga region, but in 2013 and 2014 – in Latgale region, The

number of unemployed with the higher education decreased by 13.18% in Riga region in 2014, compared to 2012, it increased by 0.9% in Vidzeme region, decreased by 18.18% in Kurzeme region, decreased by 35% in Zemgale region, decreased by 15.15% in Latgale region. The number of unemployed with vocational or secondary professional education decreased by 46.96% in Riga region, decreased by 18.64% in Vidzeme region, decreased by 21.28% in Kurzeme region, decreased by 40.26% in Zemgale region, decreased by 35.25% in Latgale region. The number of unemployed with the comprehensive secondary education decreased by 62.18% in Riga region, by 19.57% in Vidzeme region, by 32.89% in Zemgale region, by 16.12% in Latgale region, but increased by 11.32% in Kurzeme region. The number of unemployed with the primary or basic education decreased by 31.58% in Riga region, by 8.89% in Kurzeme region, by 14.89% in Zemgale region, by 16.33% in Latgale region.

Conclusions and recommendations

1) The number of unemployed people decreased significantly in the period from 2012 to 2014.

Bibliography

1. *Central Bureau of Statistics* (2015) Viewed on: 05.01.2016. Available: <http://www.csb.gov.lv/>.
2. Eglite, E., Kruze M., Osis, J. (2014) Darba tirgus specifisko regionalo problemu identifikasana un pasakumu izstradasana regionala darba tirgus konkuretspejas stiprinasanai. (Labour Market Specific Regional Problem Identification and Measure Design for Strengthening Regional Labour Market Competitiveness) Riga, Projektu un kvalitates vadiba, pp. 146.
3. Eglite, E., Kruze M., Osis, J., Brants, M. (2014) Pirmspensijas vecuma iedzivotaju ekonomiska potenciala izvertejums. (Economic Potential Evaluation of the Pre-Retirement Inhabitants) Riga, Projektu un kvalitates vadiba, pp. 72.
4. Grebenko, M. (2015) Darba likums un gramatvediba. (Labour Law and Accounting) Riga, LID, pp. 155.
5. Informativais zinojums par darba tirgus videja un ilgtermina prognozēm (Informational Report on the Labour Market Short-Term and Long-Term Forecasts) (2015). Viewed on: 24.12.2015. Available: <https://www.em.gov.lv/>.
6. Informativais zinojums par makroekonomisko situaciju valsti. (Informational Report on the Macroeconomic Situation in the Country) 2015, October. Viewed on 30.12.2015. Available: <https://www.em.gov.lv/>.
7. Kanejeva, S., (2014) *Aktualas darba tirgus tendences 2015. gada. (Topical Labour Market Trends)* Viewed on: 25.12.2015. Available: <http://www.tns.lv/>.
8. *Latvijas Nacionalais attistibas plans 2014. – 2020. gadam.* Viewed on: 24.12.2015. Available: <http://www.varam.gov.lv/>.
9. Latvijas tautsaimniecibas makroekonomiskais apskats. (Macroeconomic Review of the National Economy of Latvia) 2015-3. Viewed on: 28.12.2015. Available: <https://www.em.gov.lv/>.
10. *Parskats par bezdarba situaciju valsti (Review of the Unemployment in Latvia)* (2015). Viewed on: 20.12.2015. Available: <http://nva.gov.lv/>.
11. Zinojums par Latvijas tautsaimniecibas attistibu. (Report on the Development of the National Economy of Latvia) 2015, June. Viewed on: 03.01.2016. Available: <https://www.em.gov.lv/>.

2) The increase in the minimum salary affects only those who receive the minimum salary.

3) There exists a misbalance in labour force supply and demand.

4) Employers have problems in finding disciplined, qualified and creative permanent employees despite the unemployment rate in Latvia.

5) Within the period from 2012 to 2014, the number of economically active people decreased by 38.4 thousand.

6) The number of vacancies in the regions of Latvia in the period from 2012 to 2014 increased on average by 1839 vacant jobs.

7) The largest employment in Latvia is in trade, hospitality and catering sectors – 18.3%, the smallest in healthcare and social care – 5.9%.

8) The regional municipalities should carry out research on the reasons for unemployment decrease – whether it is due to increasing number of jobs or the emigration of inhabitants.

9) Job remuneration should be linked with the minimum salary on the basis of coefficient.

BIOECONOMY

ENVIRONMENTAL ECONOMICS VERSUS THE EMISSION OF GREENHOUSE GASES IN THE EU MEMBER STATES' AGRICULTURE

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Abstract. The first part of the article presents the issues of state intervention to limit the emission of greenhouse gases (GHG) on the background of environmental economics. This thesis presents R. H. Coase's approach and the so-called Pigouvian tax. The empirical part draws on data from the European Environmental Agency for 1990-2013. It was concluded that agriculture share in GHG emission in the European Union (EU) is small and it amounted to 12% in 2013. The greatest emitters of agricultural GHG emissions are: France - 17%, Germany -13%, the United Kingdom - 10% of emissions from agriculture. It was noticed that agriculture was a huge emitter of methane because 50% of methane emission in the EU comes from this economic sector. Enteric Fermentation – Cattle should be considered the main reason for methane emission as it accounts for 65% of methane emission in agriculture. The steps limiting GHG emission in agriculture should be focused on lowering the level of methane emission, especially in case of cattle production.

Key words: European Environment Agency, greenhouse gases emission, agriculture

JEL code: Q5

Introduction

On 12 December 2015 during a climate conference in Paris, nearly 200 countries adopted an agreement aiming to stop the global warming. The most significant provisions of the agreement were included in Article 2 of the Convention (United Nations, 2015). It envisages keeping temperature growth below the level of 2 degrees centigrade as compared to pre-industrial period and making an effort to limit the growth to 1.5 degrees centigrade. In Article 4 of the Convention, to fulfil these assumptions, the countries undertook to limit the current greenhouse gases emission (GHG) emission as soon as possible until a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases is achieved. The balance is to be achieved in the second half of the 21st century.

According to numerous climate researchers, it is the last moment to take steps aiming at preventing sudden changes which would result in irreversible changes in the Earth's biosphere. The newest observation results of the World Meteorological Organization (WMO) reveal that 2014 has been the warmest year in the history of officially conducted measurements, and even since 1500, and the ending of 2015 will appear to be even warmer (WMO, 2015). Scientists point out that these changes are caused by a huge anthropogenic emission of GHG. It has brought the level of greenhouse gases, CO₂, methane, and nitrogen oxide, which has not been recorded for 800,000 years (IPCC, 2013).

The European Union had already been leading the limitations of GHG emission. During the summit of the EU heads of state in October 2014, an agreement on climate protection was successfully worked out. First, it envisages that

the EU as a whole will limit CO₂ emissions until 2030 by at least 40% as compared to 1990. Second, the share of renewable sources of energy in the overall consumption of electricity is to be at the minimum of 27% by 2030. The steps aiming at fulfilling these goals must concern the whole economy of the EU. What seems to be new is the fact that agriculture was also covered by environmental objectives concerning the reduction of GHG emissions. It is widely accepted that agriculture is not a huge emitter of GHG and due to economic and social reasons it has been excluded from climate policy so far. The recent events, however, will bring changes in this area.

Taking the above into consideration, the aim of article is to specify significance of GHG emission in the EU agriculture. Research task: to investigate the structures of this emission as well as comparing them to emissions from other

economic sectors. The discussion will be taken based on environmental economics. Data from the European Environmental Agency for 1990-2013 were used to achieve the research objective.

Research results and discussion

Economic grounds for the reduction of GHG emission

Theoretical grounds for state intervention in GHG emissions come from environmental economics ideas and the related concept of external effects. One of the free market downsides results in suboptimal allocation of resources in terms of Pareto (Acocella N., 2002). The phenomenon of external effects can take a form of positive or negative effects. In case of negative external effects, the entities that cause them not to bear the full costs of their doings, which results in the scale of their activity being too large. A reverse situation takes place when there are positive external effects: entities do not receive an appropriate remuneration for their activity and they will run their activity at a lower level than it is desired. In case of agriculture, one can observe both situations. On the one hand, creating a pleasant landscape, providing biodiversity, and maintaining the right properties of soil are the side effects of agriculture. On the other hand, farms cause soil and surface water pollution with nitrogen compounds and they emit considerable amounts of GHG. A question arises if a state should interfere in such a situation and how to define the scope of such intervention. Economic theory provides two alternative approaches to this problem. The first one is referred to as Coase theorem and the other – Pigouvian tax.

Pigouvian tax is related to the assumption that the full social costs of a business activity are not always incurred by the entity which runs it. Pigou shows an example of a lease, where practically always, a suitable penalty is specified for returning land in an inappropriate state to a lessor, and a lessor has the right to a

compensation for introducing improvements which higher the value of a leased estate. Such compensation is, however, something unusual. In many cases, e.g. private parks in towns, private lighting of houses, emission of pollution from smokestacks, the consequences of an activity considerably exceed the borders of the given activity. To solve this issue, Pigou suggests that one should apply taxes and bonuses (Pigou A.C., 1932). They can reduce the gap between individual and social marginal costs and internalize external effects. The level of these burdens should be determined individually for each emitter and it should be equal to external costs per one unit of product. In result of applying them, in case of negative external effects (e.g. pollution), perpetrators can act in two ways. First, they can take technical steps to reduce them, which will lower the tax imposed on them. So far they have not been interested to do this because it meant cost increase without any direct benefits. Second, they can higher product price to compensate the imposed tax (Fiedor B., 2002). Yet, the idea of introducing a tax of this kind is difficult to execute. The most important problem concerns defining the level of external costs of a given entity's activity because in the market, there are usually numerous entities polluting the environment. Therefore, it is impossible to fulfil Pigou's assumption and determine the costs of external effects for each emitter. In practice, one uses solutions that connect the level of tax with the kind of emitted pollution and the amount of emissions.

A slightly different approach to the possibility of state intervention in external effects is presented by a Noble prizewinner, R. Coase (Coase R. H., 1960). In his opinion, the role of a state should be significantly limited here because the problem of external effects can be solved by free market. Each party, either an aggrieved one or the one which takes advantage of them, can run negotiations regarding

removing these effects so as to achieve a socially desirable effect. As conducting negotiations between entities polluting the environment and with the rest of the society is organizationally and technically difficult, it seems that Coase's approach is not right, and the appearance of the effects justifies state interventionism. The awareness of environmental issues is also against this solution (Bienkowska W., 2013). At the moment of GHG emissions, a considerable part of the society does not see the significance of the problem or they openly negate the influence of GHG anthropogenic emissions on climate changes.

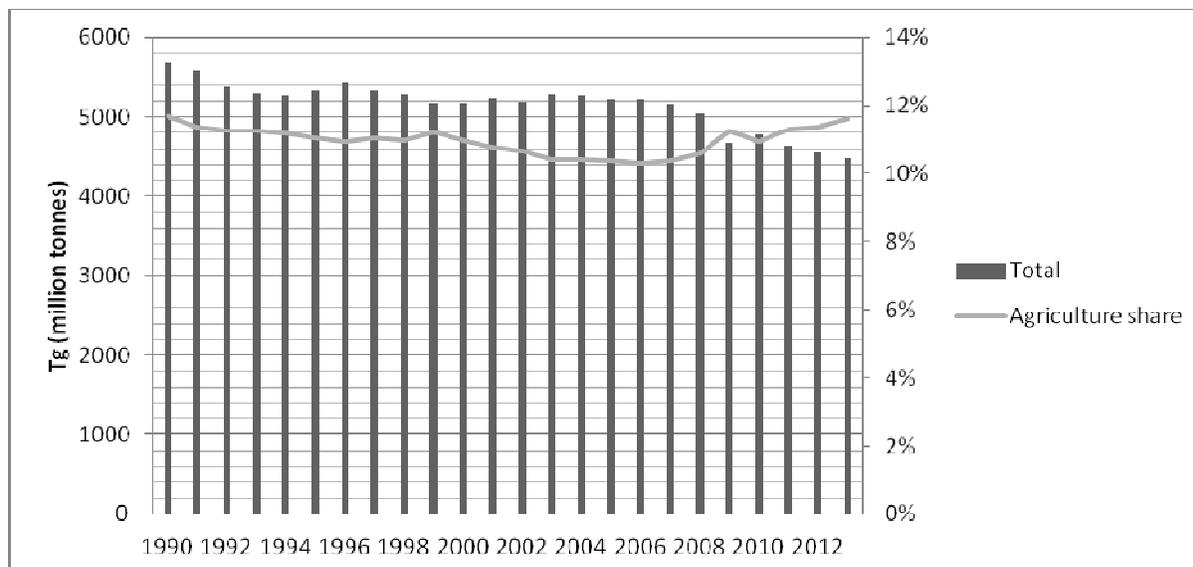
That is why two questions still remain unanswered. The first concerns the fact how a state (or the EU as a whole) is to limit, in practice, negative external effects which definitely cover GHG emission in agriculture. The other seems to be even more fundamental: does the level of GHG emission in agriculture as compared to other economic sectors really require such actions?

GHG emission in agriculture

Data from the European Environmental Agency (EEA) for 1990-2013 were used to

achieve the research objective. GHG emission data concern particular sectors of a national economy. These sectors are fully consistent with the Common Reporting format (CRF) set in the guidelines developed by the Intergovernmental Panel on Climate Change (IPCC). Generally, agriculture emission means: all anthropogenic emissions from agriculture, except for fuel combustion emissions and sewage emissions, which are covered in Energy. However, in this study, agriculture emission was extended to include certain data from the sector of energy: all GHG emissions from combustion and fugitive releases of fuels which are related to agriculture. Global Warming Potential (GWP), a conversion factor which gives the possibility to express the emissions of particular GHG as CO₂ equivalent, was applied for computations. GWPs for single greenhouse gases are as follows: CO₂-1, CH₄-25, N₂O-298, SF₆-22800, NF₃-17200 (IPCC, 2007).

At the beginning of the research period, the share of agriculture in GHG emissions in the EU amounted to 12% and it was declining till 2007, when it accounted for 10% (Figure 1). From 2008 it started growing to achieve the output value of 12%.



Source: Own calculations based on data from EEA

Fig. 1. GHG emission in agriculture and its share in the total EU emission of GHG in 1990-2013

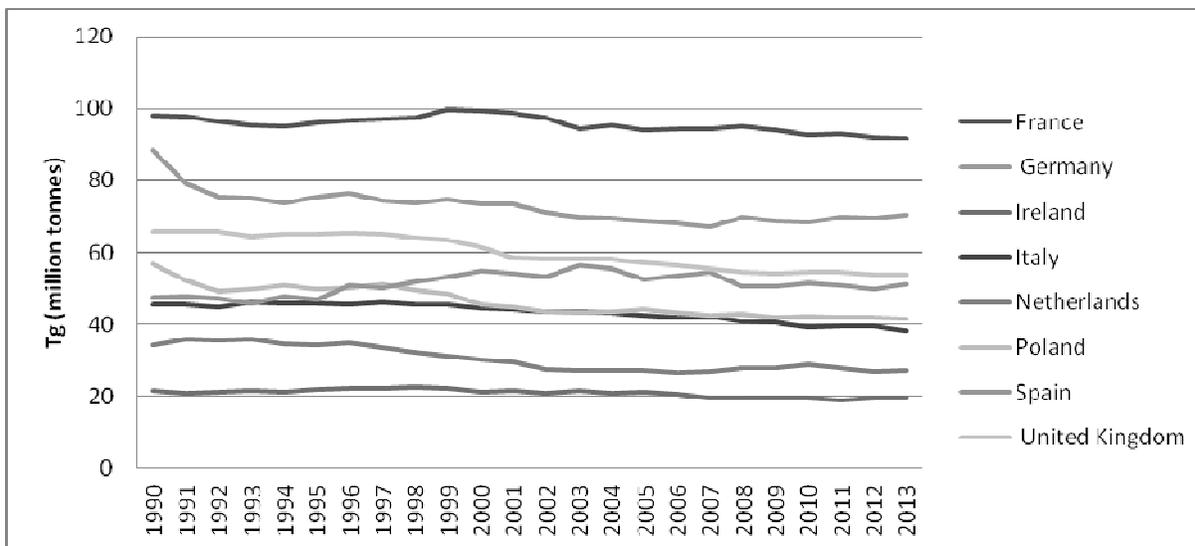
It should be pointed out that in absolute amounts, the decrease of GHG emissions in agriculture is stable in the whole period. In 1993 as expressed in CO₂ equivalent, agriculture emitted 663.6 teragrams (teragram - million tonnes) GHG and in 2013 it was only 520.6 teragrams GHG, which means a decline by 22%. The increasing share of GHG emissions in agriculture means that in other economic sectors this decrease was even more rapid from 2008. It is related to the economic crisis which started in 2008 and its consequences can be seen so far. This crisis brought a drop in business activity in industry and transport, which are the main GHG emitters.

GHG emission in particular EU countries is significantly diverse. Figure 2 shows its value for the eight largest emitters.

France has the first position with its 91 teragrams GHG in 2013, which accounted for 17% agriculture emissions in the EU. Germany – 13% is the second followed by the United

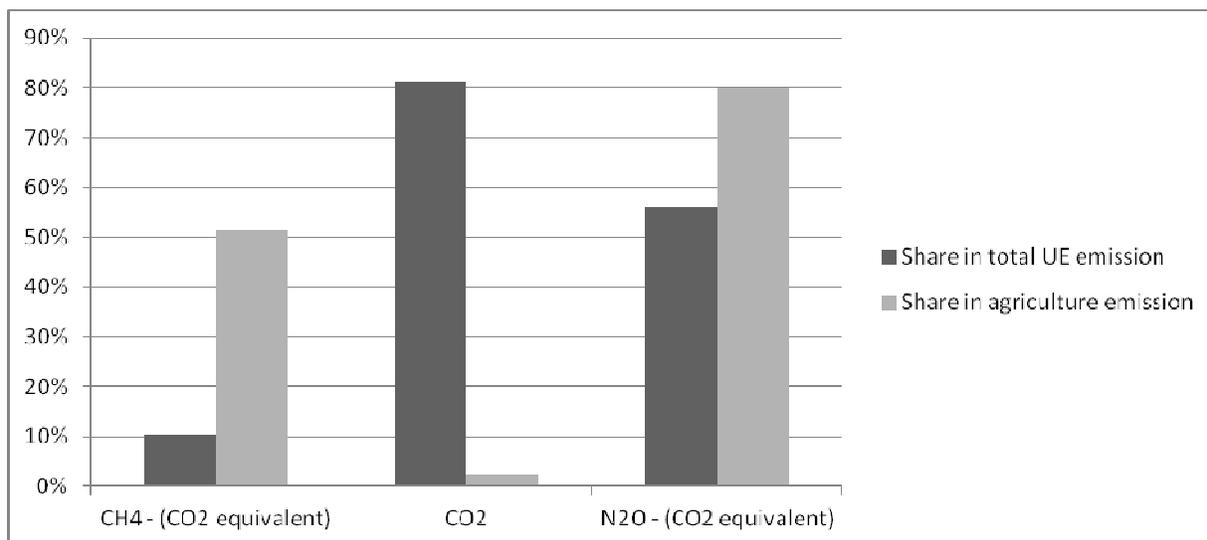
Kingdom – 10%. In all these countries, however, the level of GHG emissions in agriculture was declining in the examined period. Therefore, it should be claimed that GHG emission in agriculture is at a low level as compared to the whole EU emission and it has a decreasing tendency. Yet, the value of methane emissions in agriculture is alarming. In the whole EU, methane accounts for 10% of GHG emissions; 51% of them come from agriculture.

In 2013, methane emission expressed in CO₂ equivalent amounted to 462 teragrams, which accounts for 89% of agriculture emission (Figure 3). That is why the sources of methane emission in agriculture are worth analysing more deeply. Definitely, it is Enteric Fermentation (78% of methane emission in agriculture), with a special consideration of Cattle (65% of methane emission in agriculture) that plays the most significant role here. Manure Management is also an important item, although, it only accounts for 19% of methane emission in agriculture.



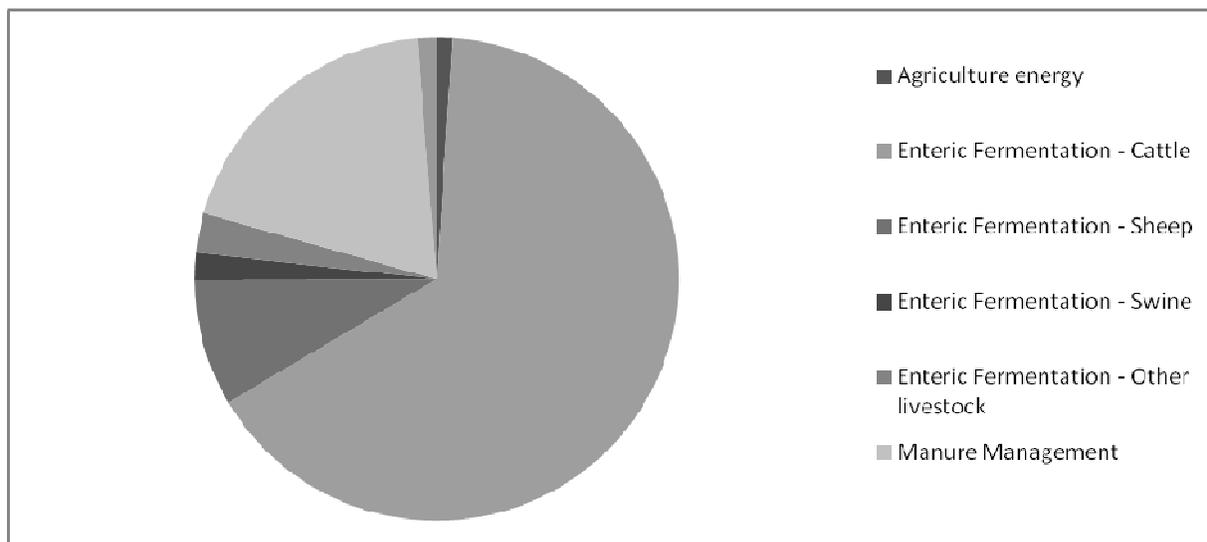
Source: Own calculations based on data from EEA

Fig. 2. GHG emission in agriculture in the greatest EU emitters in 1990-2013



Source: Own calculations based on data from EEA

Fig. 3. The structure of GHG emission in agriculture against the total EU emission in 2013



Source: Own calculations based on data from EEA

Fig. 4. The sources of methane emission in agriculture in the EU in 1990-2013

Conclusions proposals and recommendations

The research led to the following conclusions.

Agriculture share in GHG emission in the European Union is small and it amounted to 12% in 2013. GHG emission in agriculture in the whole examined period declined by 22%.

The greatest GHG emitters in agriculture in the EU are: France - 17%, Germany - 13%, the United Kingdom - 10%. The share of each of the other countries is below 10%.

It was noticed that agriculture was a huge emitter of methane because 50% of methane

emission in the EU comes from this economic sector. Enteric Fermentation - Cattle, which accounts for 65% of methane emission in agriculture, and Manure Management (19%) should be considered as the main reasons for methane emission.

It is widely accepted that agriculture is not a serious emitter of GHG. As a rule, one should agree with this opinion. The EU actions to reduce GHG emissions should rather concern other economic sectors. Yet, the problem of methane emission still remains. This gas is extremely harmful to the climate (it has 25 times stronger

influence than CO₂). There is an opportunity for the EU authorities' activity, especially as regards Cattle production and Manure Management. There is still a question about the scope of these actions, which can be considerably wide. It can consist in implementing requirements in a good agricultural practice, which would limit methane emissions (without financial penalties), subsidizing steps towards reducing methane

emissions (Baran J., 2015) or, in its strictest version, introducing emission limits at the level of farms with a possibility to sell these limits. These actions will certainly affect the profitability of agricultural production (especially livestock production) and their introduction must be supported by both further scientific research and consultations of authorities, farmers, and consumers.

Bibliography:

1. Acocella, N. (2002). *Zasady Polityki Gospodarczej: Wartości i Metody Analizy (The Foundations of Economic Policy : Values and Techniques)*. Warszawa: PWN. p. 119.
2. Baran J. (2015). Regional Differentiation of Financial Support From The European Union and its Impact on Agricultural Efficiency in Poland, *Economic Science for Rural Development, Economic Science for Rural Development: Production and Cooperation in Agriculture / Bioeconomy / Finance and Taxes. Proceedings of the International Scientific Conference*, No 37, pp. 227-237.
3. Bienkowska, W. (2013). Activities of Local Authorities in Promoting Entrepreneurship in Poland. *Rural Development and Entrepreneurship Marketing and Sustainable Consumption*, Book Series: Economic Science for Rural Development, Issue: 32, pp. 26-31.
4. Coase, R. H. (1960). The Problem of Social Cost, *Journal of Law and Economics*, Volume 3, p 1-44.
5. European Environment Agency. (2015). Manual For the EEA Greenhouse Gas Data Viewer, Version 9.0– 30, November 2015. Retrieved: www.eea.europa.eu/data, access: 20.12.2015.
6. Fiedor, B. (red). (2002). *Podstawy ekonomii środowiska i zasobów naturalnych (Fundamentals of Environmental Economics and Natural Resources)*. Warszawa: C.H. Beck. pp. 44-45.
7. Intergovernmental Panel on Climate Change. (2007). *Climate Change 2007: Working Group I: The Physical Science Basis*. Cambridge University Press. pp.33-34.
8. Intergovernmental Panel on Climate Change. (2013). *Climate Change 2013, The Physical Sciences Basis, Summary for Policymakers*, IPCC, Switzerland, p.11.
9. Pigou, A. C. (1932). *The Economics of Welfare, 4th ed*, London: Macmilan, The Online Library Of Liberty, p. 105.
10. United Nations. (2015). Framework Convention on Climate Change. FCCC/CP/2015/L.9. 12 December 2015.
11. World Meteorological Organization. (2015). 2015 likely to be Warmest on Record, 2011-2015 Warmest Five Year Period, Retrieved: <https://www.wmo.int/media/content/wmo-2015-likely-be-warmest-record-2011-2015-warmest-five-year-period>, access: 22.12.2015.

COMPARISON OF THE CONSUMPTION OF WOOD PELLETS BETWEEN LATVIA AND OTHER EU COUNTRIES

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Abstract. The paper explores the consumption of food pellets in Latvia by analyzing their production and consumption in comparison with other EU countries, exploring the role of wood pellets in heating, and studying the main support mechanisms. Suitable qualitative and quantitative research methods have been applied to the studies. The production of wood pellets is very developed in Latvia, though only 10% is consumed on the local market, mostly by households; the present use of wood pellets in the energy transformation sector is insignificant. The notable price advantage of wood pellets against natural gas and the current high share of natural gas in the transformation sector imply on great replacement opportunities for fuelwood in Latvia. The production and consumption of fuelwood in Latvia is mainly promoted by the investment support, which has contributed to the development of the consumption of food chips by heat and CHP plants. Despite the higher price of wood pellets compared to other wood fuels, technical properties make them generally a comfort and efficient wood fuel, which is confirmed by the broad use of wood pellets in Denmark and Sweden. Although wood pellets might not be the immediate substitute for fossil fuels in Latvia, in the light of the increased movement towards low-carbon economy, wood pellets allow replacing a great deal of currently used natural gas in the transformation sector.

Key words: wood pellets, RES, consumption, Latvia.

JEL code: Q42

Introduction

The Baltic States are among the leaders in the export of food pellets in the European Union (EU), accounting for almost 30% of the total EU export value in 2014. Moreover, Latvia is the single largest exporter of wood pellets in the EU, leaving behind such an important suppliers as Germany and Austria. The total EU's import demand of wood pellets, concentrated by the United Kingdom, Italy and Denmark, is met with the Baltic pellets to a considerable extent. The total export value of Latvian wood pellets was EUR 168.1 million in 2014, which is a notable contribution to the foreign trade balance of the country (Eurostat, 2015a).

Despite the availability and competitiveness on foreign markets, Latvian food pellets are currently scarcely used in the energy transformation sector on the local market. At the same time, Latvia is one of the few countries, whose possibilities (based on its current and planned policies) to reach the binding targets for renewable energy of 2020 have been questioned by the European Commission in its latest renewable energy sources (RES) progress report (European Commission, 2015). In its turn, the

neighbouring Estonia is the first EU country to already fulfil its 2020 RES targets (Potisepp, 2015). Moreover, at the end of 2014, the European Council agreed on the 2030 climate and energy policy framework, setting the EU target of at least 27% for the share of RE consumed in the EU by 2030. Contrary to the targets of 2020, no binding national targets have been set, so as not to, inter alia, prevent Member States from setting more ambitious targets and supporting them in an appropriate way (European Council, 2014). For example, the Danish energy policy goals already envisage that the share of green fuels in electricity and heat consumption in Denmark is 100% by 2035 (Danish Energy Association, 2014).

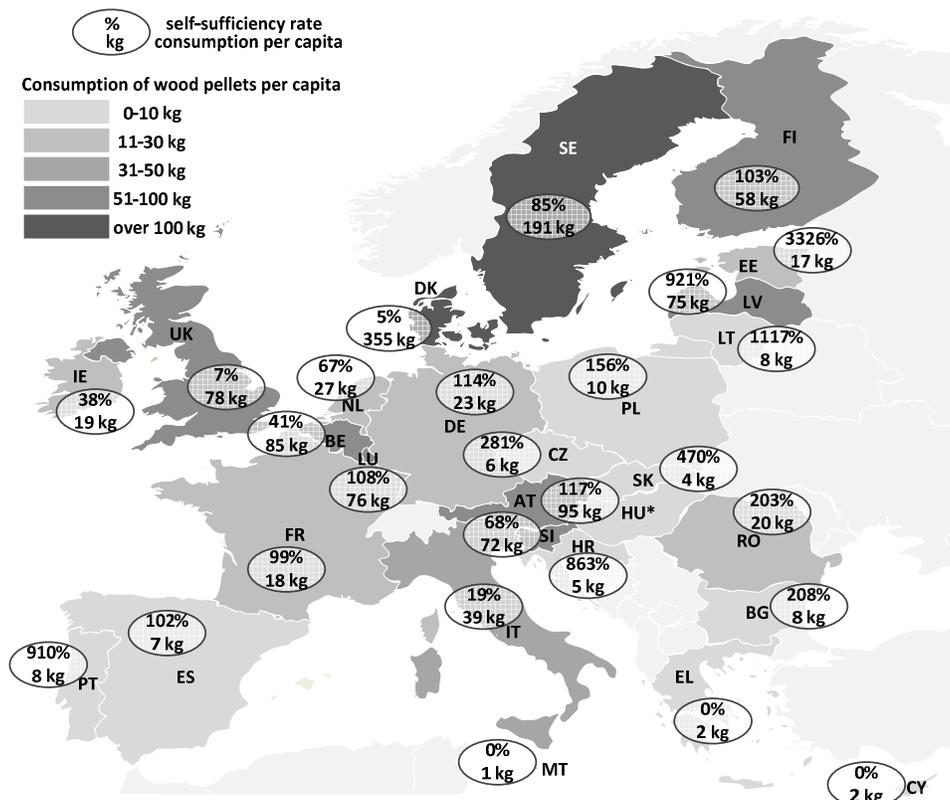
Considering the availability, wood pellets could be more widely used on Latvian market, thus, facilitating to the transition towards low-carbon economy, inter alia, greater energy security. Therefore, the objective of the paper is to explore the consumption of food pellets in Latvia, inter alia, the role of the support in its development.

Several tasks were set to reach the objective: 1) to analyze the production and consumption of wood pellets in Latvia in comparison with other EU countries; 2) to explore the role of wood

pellets in heating in Latvia; and 3) to study the support mechanisms for RES promotion in heating in Latvia and other Baltic countries as well in the largest wood pellet consuming countries - Denmark and Sweden.

The main materials used for the studies are as follows: different sources of literature - research papers and reports of institutions and

organizations; data from Eurostat and FAOstat databases as well as the Central Statistical Bureau (CSB) of Latvia data. Suitable qualitative and quantitative research methods have been applied to various solutions in the study: monographic; analysis and synthesis; data grouping; logical and abstractive constructional etc.



*consumption is calculated as production plus imports minus exports; self-sufficiency rate is obtained as production versus consumption; negative consumption obtained for Hungary

Source: authors' calculations and construction based on Eurostat (2015a, 2015b), FAOstat (2015), CSB of Latvia (2015b) and Statistics Estonia (2015)

Fig. 1. Consumption indicators of wood pellets in the EU countries in 2014

Research results and discussion

1. Wood pellet production and consumption patterns in the EU countries

In order to compare the level of wood pellet production and consumption among the EU countries, the self-sufficiency rate and consumption of wood pellets per capita was calculated by the authors (Figure 1). The self-sufficiency in wood pellets is very high in all Baltic States, indicating on much more developed level of production than consumption in these countries. In Latvia and Lithuania, the production

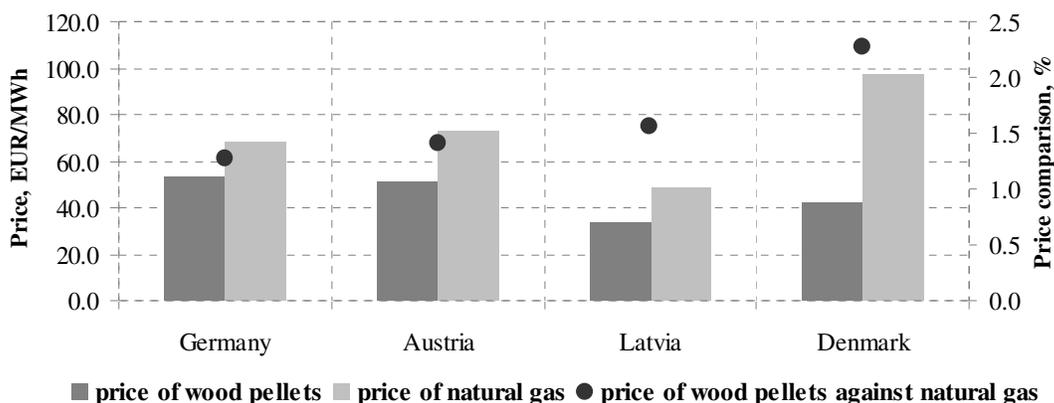
of wood pellets was about 10 times the level of their consumption in 2014, while Estonians consume only a very insignificant part of their wood pellet production. Moreover, the production of wood pellets is developed in general if measured by the quantity of wood pellets per capita in Latvia. The production of wood pellets in Latvia and Estonia exceeds 500 kg per capita, while the nearest followers – Sweden and Austria – do not reach 200 kg per capita; and the average indicator for the EU is obtained at somewhat 26 kg per capita. Also, in absolute terms Latvia is the third largest producer of wood

pellets in the EU after Germany and Sweden, allowing it to be the leading exporting country in the EU. Considerably more developed production of wood pellets against the level of the consumption is also to be observed in Portugal and Croatia.

Due to the small production of wood pellets per capita, the lowest self-sufficiency in wood pellets amongst their producers is to be found in the largest importing countries - Denmark, the United Kingdom and Italy. Among them, Denmark has the distinctively largest consumption of wood pellets per capita in the EU – 355 kg. Wood pellets are intensively consumed also in Sweden (191 kg), and it exists along with a high consumption of other fuelwoods as well as comparatively very large consumption of nuclear power in the country's energy mix (Swedish Energy Agency, 2015). In Latvia, the consumption of wood pellets has been on a rise – in 2010, it was only 15 kg per capita, increasing to already 68 kg in 2012 and reaching even 75 kg per capita in 2014; the development has

mainly taken place in the consumption of households.

To evaluate one of the main driving forces for consumption – price, wood pellet prices were analyzed against the prices of natural gas in some of the Baltic Sea region countries for which price data were available (Figure 2). The comparison of the available data reveals that there is very high stimulus to use wood pellets for energy production in Denmark as natural gas is about twice as expensive as wood pellets. It has been reported that in the Danish residential heating market very high taxes on oil and gas for heating have been significant drivers for pellet consumption. When the basic oil and gas prices are also high, pellet heating becomes very favourable (Pelletsatlas, 2009a). In Austria, the price of natural gas is about 40% higher than the price of wood pellets. According to ProPellets Austria (2015), the price is where wood pellets display their true strength as no other comfort fuel can presently keep up with wood pellets in terms of price advantage, making this green heat economically attractive.



*pellet price (all taxes included): Germany, Austria order of 6 t; Latvia – average to end consumers; Denmark – for district heating, order over 5 t, data of 2013; natural gas (all taxes included) – domestic consumption, 20GJ < consumption < 200GJ, 2nd semester; conversion factor used for pellets 1t=4.8 MWh (used by FOEX)

Source: authors' calculations based on DEPI (2015), proPellets Austria (2015), CSB of Latvia (2015b), Stelte et al. (2015), FOEX (2015), Eurostat (2015c)

Fig. 2. Price advantage of wood pellets against natural gas in selected EU countries in 2014

In Latvia, the price advantage of wood pellets is also significant – natural gas is by almost 60% more expensive, still wood pellets account only for a small share in heating. Compared to

relatively less comfort fuelwood, wood pellets are about twice as expensive as firewood, and the price difference with wood chips is even more pronounced (CSB of Latvia, 2015b). Detailed

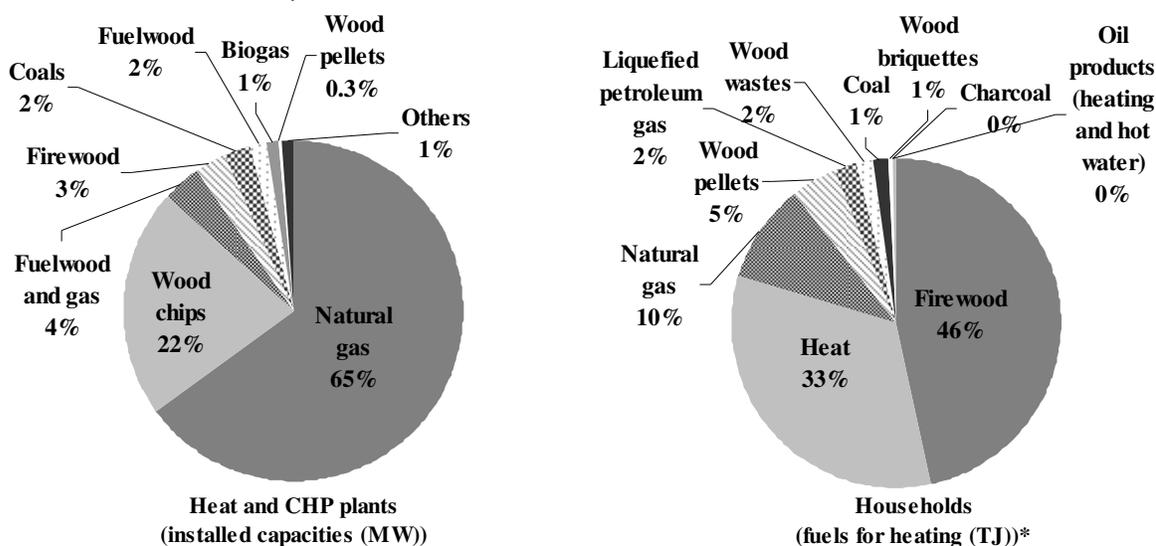
structure of the fuel use in heating and the role of wood pellets in Latvia are discussed further.

2. Role of wood pellets in heating in Latvia

Only about 10% of the total wood pellets produced in Latvia are consumed on the local market. Out of the total gross inland consumption of wood pellets, only 6% are used in the production of heat and electricity (i.e. transformation sector), with majority of wood pellets being consumed by households (76% in 2014) (CSB of Latvia, 2015b).

According to the available data on household energy consumption mainly for heating purposes (without electricity used for heating as there are no detailed data available) in 2014 (Figure 3), wood pellets account for about 5% of the total household fuel use that equals 114 thousand

tonnes. The consumption of wood pellets in households has been growing: only 14 thousand tonnes of wood pellets were combusted in 2010. Positively, the most important fuel used by households is firewood making almost half of the individual heating sector consumption and which can largely be linked with the low price of firewood. Another 1/3 of the total household energy consumption mainly for heating purposes is heat delivered through centralized heating systems. Therefore, larger utilization potential of wood pellets in household sector most probably firstly lies in the substitution of presently used natural gas, which makes about 10% of the total fuel consumption in individual heating, although, there has been a decreasing household consumption of firewood as well.



*household final energy consumption; electricity used for heating not included; oil products for heating from Household Energy Consumption Survey of 2010 (total household use of oil products very similar in 2014 and 2010)

Source: authors' calculations based on the CSB of Latvia (2015b, 2013)

Fig. 3. Structure of fuels used in heating in Latvia in 2014

The structure of the installed heat capacity of heat plants and combined heat and power (CHP) plants by fuel type reveals (Figure 3) that plants using wood pellets as the main fuel account for less than 1% of the total heating capacities. The main fuel types used by heat and CHP plants are natural gas and wood chips; with natural gas accounting for almost half of installed capacities of heat plants and 78% of CHP plants (overall, natural gas accounts for 64% of the total fuel use

by the transformation sector), thus, indicating on great replacement opportunities for fuelwood. Wood pellets are used as the main fuel by 41 heat plants, with the total installed heating capacity of 21 MW. The number and installed capacities of plants using wood pellets as the main fuel has been growing in Latvia: in 2007, there were only 11 heat plants having heat capacity of 9 MW. In total, only as negligible amount as 8 thousand tonnes of wood pellets

were used in the transformation sector in Latvia in 2014.

There has been an increasing consumption tendency of fuelwood (mostly wood chips) in Latvia since 2012 (CSB of Latvia, 2015b). It has been due to a couple of fuelwood projects, the most important of which include transition of the centralized heating systems of three large Latvian cities to wood chips, introduction of new wood chip CHP plants as well as due to the start of new wood pellet production projects and modernization of energy sector of wood processing enterprises (CSB of Latvia, 2015a; Bumanis et al., 2014). Apart from other potential sources, Latvia still has large reserves of fuelwood export to be used in the local energy sector. Up to now, wood chips have been more preferred by heat and CHP plants than wood pellets, some researchers also do not consider wood pellets as the immediate substitution option for fossil fuel because their production includes additional costs and pellets is a product of high value added, the export of which has positive impact on the country's economy (Bumanis et al., 2014). Nevertheless, in the light of the increased movement towards low-carbon economy, wood pellet export offers the most substitution possibility – wood pellets accounted for 77% of the total Latvian fuelwood exports in 2014 and they could replace a great deal of currently used natural gas in the transformation sector, contrary to wood chips whose exports could replace only a small part of this fossil fuel (CSB of Latvia, 2015b).

Despite the higher price of wood pellets compared to other wood fuels, technical properties make them generally a comfort and efficient wood fuel preferred both by households as well as by large heating systems (Nunes et al., 2016; Trømborg et al., 2013). Wood pellets are the most highly refined form of solid wood fuel, whose high energy density translates into lower handling, transportation and storage costs, which is especially appealing in cases when cost

efficient supply is a challenge due to storing limitations and long transportation distances; ability to be stored and economic transportation of wood pellets adds to the security of supply (Billington Bioenergy, 2015; Wood chips and..., 2015; García-Maroto et al., 2015; Mola-Yudego et al., 2014; Harrison, 2014; Trømborg et al., 2013). Being compact fuel, wood pellets are also easy to be stored and transported, making them a comfortable wood fuel for households (Thomson et al., 2015; Mola-Yudego et al., 2014). It has also been noted that wood pellets can be more affordable on a limited budget because they can be purchased in small quantities (Thomson et al., 2015). Due to their homogeneity and standardization wood pellets are suited to be used in combustion systems that are becoming fully automated, thus, requiring less man input (García-Maroto et al., 2015; Nunes et al., 2016; Wood chips and..., 2015). Wood pellet boilers are generally cheaper than wood chip systems, moreover, wood pellets can be used in most wood chip systems, however wood chips generally can't be used in pellet only systems (Wood chips and..., 2015; Billington Bioenergy, 2015). In addition, wood pellets have a clear burning and present the reduction of ashes (Mola-Yudego et al., 2014).

The broad use of wood pellets in Denmark and Sweden also confirms their advantages and preference. In Denmark, contrary to the situation in Latvia, wood pellets are used in all sizes of combustion plants - more than 60% of the total wood pellet consumption in Denmark refers to district heating and mainly CHP plants, and about 30% is consumed by households (Stelte, 2012). Considering that Denmark is an importer of fuelwood (Danish Energy Agency, 2015), it is rather rational that wood pellets as the fuelwood with low transportation costs is preferred to reach their RES targets. At the same time, Sweden, which is one of largest wood pellet producers, is also a large wood pellet consumer - wood pellets are used in all sizes of combustion

plants, about 40% of which are consumed by large district heating plants and CHP plants (Pelletsatlas, 2009b; Nunes et al. 2016). Denmark and Sweden both are early adopters of wood fuels (Olsson and Hillring, 2013), the utilization of wood pellets in the district heating sector started already the 1980s (Pelletsatlas, 2009a, 2009b). Moreover, it is considered that biomass in CHP plants replacing coal and gas is a key measure and an inexpensive way to achieve Denmark's CO₂ reduction goals; and, therefore, it is planned that in the future wood pellets will represent most biomass used in the CHP plants, while wood chips will primarily be used in small and medium-sized CHP plants (Danish Energy Association, 2014). This implies that already large consumption of wood pellets in Denmark is going to become even larger.

3. Support to RES in heating

The use of RES in heating in Latvia is mainly stimulated in the context of energy-efficiency, which, inter alia, includes the transition from fossil fuels to RES and the efficient use of them and the produced heat. The main support instrument used is investment support. Cohesion Fund 2007-2013 provided investment support for the increase of the efficiency of heat supply systems, covering also displacement of fossil fuel. In 2014-2020, it is planned to continue to support the increase in the energy efficiency of centralized heat supply systems, including the promotion of the transition to RES as well as increase the efficiency of buildings, inter alia, supporting the use of RES in public and residential buildings. There have also been project calls within Climate Change Financial Instrument (CCFI) (state budget programme, started in 2009) targeted at transition from fossil fuel to RES in heat supply systems as well as the use of RES by households. As regards the production of bioenergy, investment support to production of fuel of agricultural and forestry origin has been granted within RDP 2007-2013 as part of rural diversification measures to new and

existing rural enterprises. There have also been support measures in Latvia promoting the use of RES in CHP plants, with the emphasis on bioelectricity generation (Melece and Krievina, 2015). The consumption of fuelwood in households for the household needs is also stimulated by lower VAT tax rate (RES LEGAL, 2014).

The available data do not allow making a thorough analysis of all supported medium and large investment projects in heating by fuel type, however, the overall tendency has been that wood chips have been the most popular type of fuelwood among heating and CHP plants using fuelwood, which is confirmed by the analyzed fuel use structure. At the same time, there is quite detailed data available on the approved RES projects for households within CCFI. The use of wood pellets can be identified in about 70% biomass projects (without mixed technologies) planned by households. Though, biomass projects account only for about 20% of all household projects, with solar and heat pumps being the most preferred RES technologies by households applying for the support (LEIF, 2012).

As regards the situation in other Baltic States, in Lithuania, there are three main instruments used to promote RES in heating: guaranteed purchase of heat from independent RES producers (meeting lower price, quality, supply security, environmental and consumers demand criteria); subsidies from the Lithuanian Environmental Investment Fund; and environmental pollution tax relief for solid and liquid biomass. Similarly like in Latvia, in Estonia, RES in heating are promoted mainly by investment support. The investment support is round-based and can be granted for the construction of RES CHP plants, reconstruction of boiler-houses to make them operational for RES and for the reconstruction of the district heating network to improve energy efficiency. Additionally, RES investment supports are made

available for the owners of private houses and apartment buildings (RES LEGAL, 2014).

Table 1

Decomposition of the end-price of natural gas in selected EU countries in 2014

Indicator	Latvia	Lithuania	Estonia	Denmark	Sweden	EU-28
Price (excluding taxes and levies)	79%	83%	79%	39%	55%	77%
Taxes and levies	21%	17%	21%	61%	45%	23%
Price (all taxes and levies included)	100%	100%	100%	100%	100%	100%

*natural gas – domestic consumption, 20GJ < consumption < 200GJ, 2nd semester

Source: authors' calculations based on Eurostat (2015c)

In Denmark and Sweden, mainly tax mechanisms are used to promote RES in heating. There are several taxes on the production, supply and use of energy sources for heating in Denmark but RES do not classify as the objects of these taxes. Denmark also supports the use of biogas for heating through a direct premium tariff of used biogas. Similarly, in Sweden, energy and carbon dioxide taxes are levied on the supply, import and generation of fossil fuels for heating purposes but RES are exempt from these taxes; heat producers using RES are exempt from a nitrous oxide tax as well. As regards households, labour costs relating to the installation or replacement of RES devices are eligible for income tax deduction in Sweden (RES LEGAL, 2014). The burden of taxes and levies are very high in Denmark and Sweden, from Table 1 it can be seen that taxes and levies make even 60-45% of the end-price of natural gas in these countries in comparison with 21% in Latvia. It has been noted that the carbon dioxide tax introduced in Sweden in 1991 was the main driver for large scale facilities for converting from fossil fuel to solid biofuels, and the high fossil fuel taxes are the basic mechanism that still supports the strong development of biomass markets in district heating and individual households (Pelletsatlas, 2009b). Biomass use in CHP plants is also stimulated by premium tariff in Denmark and quota system in Sweden (RES LEGAL, 2014).

Conclusions, proposals, recommendations

1) The production of wood pellets is very developed in Latvia, which is characterized by

per capita production of wood pellets exceeding 500 kg (Sweden does not reach 200 kg per capita) and also in absolute terms Latvia being the third largest producer of wood pellets in the EU after Germany and Sweden. The production of wood pellets in Latvia is much more developed than their consumption, allowing it to be the leading exporting country in the EU.

2) Only about 10% of the total wood pellets produced in Latvia are consumed on the local market, mostly by households. The present amount of wood pellets used in the energy transformation sector is insignificant. However, the notable price advantage of wood pellets against natural gas and the current high share of natural gas in the fuel consumption structure of the transformation sector imply on great replacement opportunities for fuelwood.

3) Wood chips are the most important fuelwood used by heat and CHP plants in Latvia. However, despite the higher price of wood pellets compared to other wood fuels, technical properties (high energy density and associated lower handling, transportation and storage costs; homogeneity and standardization allowing automatization etc.) make them generally a comfort and efficient wood fuel preferred by households as well as by large heating systems, and which is confirmed by the broad use of wood pellets in Denmark and Sweden.

4) The production and consumption of fuelwood in Latvia is mainly promoted by the

investment support, which has contributed to the development of the consumption of food chips by heat plants and CHP plants. The similar support mechanism is also applied in other Baltic countries. In its turn in Denmark and Sweden, fossil fuels are highly taxed in contrast to fuelwood and it has been a strong driver for the transition to solid biomass.

5) Although wood pellets might not be the immediate substitute for fossil fuels in Latvia, in the light of the increased movement towards low-carbon economy, wood pellet export allows replacing a great deal of currently used natural gas in the transformation sector, contrary to wood chips whose exports could replace only a small part of this fossil fuel.

Bibliography

1. Billington Bioenergy (2015). *Why Wood Pellets*. Retrieved: <http://www.billingtonbioenergy.co.uk/index.php/why-biomass>. Access: 06.11.2015
2. Bumanis K., Krasavcevs I., Lise S., Stepina A. (2014). *Monitoring of Wood Biomass Use in Energy* (in Latvian). Retrieved: https://www.zm.gov.lv/public/ck/files/ZM/mezhi/MAF/Koksnes%20biomasas%20izmantosana%20energija%20ieguve%20monitorings_MEKA.pdf. Access: 16.11.2015
3. CSB of Latvia (2015a). *Consumption of RES Grown by 12% over Last Ten Years* (in Latvian). Retrieved: <http://www.csb.gov.lv/notikumi/atjaunigo-energoresursu-paterins-pedejos-desmit-gados-pieauga-par-12-41874.html>. Access: 07.11.2015
4. CSB of Latvia (2015b). *Energy Statistics Database*. Retrieved: http://data.csb.gov.lv/pxweb/en/vide/vide__ikgad__energetika/?tablelist=true&rxid=a79839fe-11ba-4ecd-8cc3-4035692c5fc8. Access: 03.11.2015
5. CSB of Latvia (2013). *Energy Consumption in Households* (TJ). Retrieved: http://data.csb.gov.lv/pxweb/en/vide/vide__energ_pat/0303.px/?rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0. Access: 06.11.2015
6. Danish Energy Agency (2015). *Annual Energy Statistics*. Retrieved: <http://www.ens.dk/en/info/facts-figures/energy-statistics-indicators-energy-efficiency/annual-energy-statistics>. Access: 06.11.2015
7. Danish Energy Association, *Danish District Heating Association* (2014). Biomass for Energy: Why Coal and Gas should be Replaced by Wood Pellets and Wood Chips. Retrieved: <http://www.danishenergyassociation.com/Theme/BiomassForEnergy.aspx>. Access: 05.11.2015
8. DEPI (2015). *Annual Average Prices of Wood Pellets 2006-2014* (in German). Retrieved: http://depi.de/media/filebase/files/infothek/images/DEPI_Jahresdurchschnittspreise_Pellet.jpg. Access: 03.11.2015
9. Eurostat (2015a). *Comext Database: EU Trade since 1988 by CN8*. Retrieved: <http://epp.eurostat.ec.europa.eu/newxtweb/setupdimselection.do>. Access: 08.10.2015
10. Eurostat (2015b). *Population on 1 January by Age and Sex*. Retrieved: <http://ec.europa.eu/eurostat/data/database>. Access: 08.10.2015
11. Eurostat (2015c). *Gas Prices for Domestic Consumers*. Retrieved: <http://ec.europa.eu/eurostat/data/database>. Access: 03.10.2015
12. European Commission (2015). *Renewable Energy Progress Report*. Retrieved: <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>. Access: 10.11.2015
13. European Council (2014). *Conclusions on 2030 Climate and Energy Policy Framework*. Retrieved: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145356.pdf. Access: 19.11.2015
14. FAOstat (2015). *Forestry Production and Trade Database*. Retrieved: <http://faostat3.fao.org/download/F/FO/E>. Access: 12.10.2015
15. FOEX (2015). *PIX Pellet Nordic Industrial Index Specification*. Retrieved: <http://www.foex.fi/index.php?page=pix-rcp>. Access: 03.11.2015
16. García-Maroto I., García-Maraver A., Muñoz-Leiva F., Zamorano M. (2015). Consumer Knowledge, Inf. Sources used and Predisposition towards the Adoption of Wood Pellets in Domestic Heating Systems. *Renewable and Sustainable Energy Reviews*, Vol. 43, pp 207–215.
17. Harrison N. (2014). *The Big Biomass Debate, Woodchip or Pellets*. Retrieved: <http://www.thescottishfarmer.co.uk/mobile/renewables/biomass/the-big-biomass-debate-woodchip-or-pellets.24723855>. Access: 07.11.2015
18. Latvian Environmental Investment Fund (LEIF) (2012). *Utilization of RES in Household Sector. List on Concluded Project Agreements* (in Latvian). Retrieved: http://www.lvif.gov.lv/?object_id=30241. Access: 11.10.2015
19. Melece L., Krievina A. (2015) Development of Bioenergy: *State and Issues in Latvia. Management Horizons in Changing Economic Environment Visions and Challenges*: Proceedings of the International Scientific Conference, Kaunas: Vytautas Magnus University, pp.309-326.
20. Mola-Yudego B., Selkimäki M., González-Olabarria JR. (2014). *Spatial Analysis of the Wood Pellet Production for Energy in Europe*. *Renewable Energy*, Vol. 63, pp 76–83.

21. Nunes L.J.R., Matias J.C.O, Catalão J.P.S. (2016). *Wood Pellets as a Sustainable Energy Alternative in Portugal. Renewable Energy*, Vol. 85, pp. 1011–1016.
22. Ollson O., Hillring B. (2013). *Pellet Markets in Northern Europe: Price Formation and Market Integration*. Retrieved: http://nobio.no/upload_dir/pics/Olle-Olsson.pdf. Access: 04.11.2015
23. Pelletsatlas (2009a). *Pellet Market Country Report: Denmark*. Retrieved: http://piirb1q7sc948r4632ws3mf9.wpengine.netdna-cdn.com/wp-content/uploads/2015/09/Denmark_CR.pdf. Access: 25.10.2015
24. Pelletsatlas (2009b). *Pellet Market Country Report: Sweden*. Retrieved: http://piirb1q7sc948r4632ws3mf9.wpengine.netdna-cdn.com/wp-content/uploads/2015/09/Sweden_CR.pdf. Access: 25.10.2015
25. Potisepp R. (2015). *Renewable Energy, Energy Independence and Climate Goals in Estonia*. Retrieved: http://www.atjaunojam.lv/attachments/article/114/AE_EE_Riga_1806_2015.pdf. Access: 10.11.2015
26. Propellets Austria (2015). *Wood Pellets Prices. Price Details and Charts*. Retrieved: <http://www.propellets.at/en/pellet-price/details/>. Access: 03.11.2015
27. RES LEGAL Europe (2014). *Support Schemes Country Overview*. Retrieved: <http://www.res-legal.eu/home/>. Access: 09.12.2015
28. Statistics Estonia (2015). *Energy Balance Sheet*. Retrieved: http://pub.stat.ee/px-web.2001/I_Databas/Economy/07Energy/02Energy_consumption_and_production/01Annual_statistics/01Annual_statistics.asp. Access: 04.11.2015
29. Stelte W., Hinge J., Dahl J. (2015). *Sustainable Int. Bioenergy Trade – Securing Supply and Demand. Country Report 2014 for Denmark*. Retrieved: <http://www.bioenergytrade.org/downloads/iea-task-40-country-report-2014-denmark.pdf>. Access: 25.10.2015
30. Stelte W. (2012). *Global Market for Wood Pellets and Price Development*. Retrieved: http://www.ens.dk/sites/ens.dk/files/undergrund-forsyning/vedvarende-energi/bioenergi/analyse-bioenergi-danmark/temamoeder/Market%20and%20Price%20Projection%20for%20Wood%20Pellets_Wolfgang_Stelte_DT.pdf. Access: 21.11.2015
31. Swedish Energy Agency (2015). *Energy Balance*. Retrieved: <http://epi6.energimyndigheten.se/Statistik/Energibalans/Energibalans/>. Access: 08.11.2015
32. Thomson H., Liddell C. (2015). *The Suitability of Wood Pellet Heating for Domestic Households: A Review of Literature. Renewable and Sustainable Energy Reviews*, Vol. 42, pp 1362–1369.
33. Trømborg E., Ranta T., Schweinle J., Solberg B., Skjevraak G., Tiffany D.C. (2013). *Economic Sustainability for Wood Pellets Production - A Comparative Study between Finland, Germany, Norway, Sweden and the US. Biomass Bioenergy*, Vol. 57, pp 68–77.
34. *Wood Chip and Pellet Boilers inc. Automated Systems* (2015). Retrieved: <http://www.usewoodfuel.co.uk/using-woodfuel/wood-fuel-equipment-and-systems/boilers-and-stoves/wood-chip-and-pellet-boiler-systems-inc-automated-systems.aspx>. Access: 10.11.2015

BIO-ECONOMY SECTOR IN POLAND AND ITS IMPORTANCE IN THE ECONOMY

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Abstract. The aim of the study is to identify the importance of bio-economy in Poland, both in the traditional and the innovative sectors. The analysis covered the years 2000-2014. In this study were used statistical data from the Central Statistical Office and data from Agricultural Market Agency. The importance of the discussed sector was evaluated mainly based on its share in the entire economy. It was found that bio-economy sector generates 6.5% of gross value added, nearly 20% of employment and 15% of the Polish export. Energy production from biomass is almost 10% of overall production of energy. Modern, innovation-based sectors of bio-economy are still not developed and the related technologies are in the phase of laboratory tests. The structure of bio-economy in Poland is dominated by traditional sectors: agriculture and agri-food industry. Energy production from biomass is carried out using not very innovative technologies. A precondition for development and dissemination of new technologies is the support of public funds.

Key words: bio-economy, bio-energy, agriculture, food processing, forestry.

JEL code: Q16, Q23, Q42

Introduction

Bio-economy is a part of the national economy, which uses biomass – renewable biological material from agriculture, forestry and seas. It is a broad term, which (as defined by the Organisation for Economic Cooperation and Development (OECD)) encompasses any activity associated with use of biotechnology, bio-processes and bio-based products, aimed at production of goods and services. The emergence of the concept of bio-economy was linked with a noticeable continuing deterioration of the natural environment and the related decreasing availability of natural resources. This requires a change in public attitudes to the issue of production, consumption, storage and recycling of biological resources. As pointed out by Christian Paternmann, it is a new concept, which is still difficult to understand for a wider audience (EC, 2012).

Development of bio-economy is a topic increasingly discussed in the sphere of policy-making and economics. Both in the European Union (European Commission, 2012) and in the United States of America (The White House, 2012), bio-economy is mentioned as an important area of development. However, a relatively new concept of bio-economy is still not precisely defined. There are two groups of definitions (Maciejczak, 2015). From a broad

perspective, bio-economy is a system combining natural resources, technologies, markets, people and policies. This includes both industry based on the old, well-known technologies and the new sectors, which use innovative technologies and, at the same time, are linked by symbiotic relationship, where one sector uses the products, which are by-products of another sector. In a narrow meaning, bio-economy is the use of biotechnology in the industry, environmental protection and in challenges posed by climate change. Most definitions associate bio-economy with sectors, which use raw materials and biological processes: from food production, through production of chemicals and pharmaceuticals, up to production of energy (Maciejczak and Hofreiter, 2013). The importance of broadly defined bio-economy in the EU is very high. In this sector around 22 million people are working, and its market size is approximately EUR 1.5 trillion (Paternmann, 2008).

The growing interest of the scientists, governments and societies in bio-economy is a result of new challenges in the modern world. Growing population and demand for food, scarcity of energy resources as well as climate change and environmental pollution are just a few of them. It is postulated to act globally and to develop new, innovative processes, products and services (Tapscott and Williams, 2011;

Bukowski, Szpor and Sniegocki, 2012). Eco-innovation proposed by bio-economy allows us to minimise the negative phenomena (Chylek and Rzepecka, 2011). Significant limitations in development are often a result of poor relations between the bio-economy research and business.

In Poland, traditional bio-economy sector is well developed and produces about 8% of domestic value added (Wicki and Grontkowska, 2015) but modern and innovative areas of bio-economy are still in the early stages of development. Only energy from biomass is produced on an industrial scale but just as in the entire European Union, biomass is mainly used for heat energy production for home heating (SeeNews, 2015).

Likewise, the world production of bio-based products with high value added is low. Polymer production from biomass is just a fraction of world production. For example, production of bio-polypropylene is only 0.02% of its global production (TechNavio, 2015b). In 2014, value of the global market for bio-refining was USD 425 billion (TechNavio, 2015), including green chemicals market totalling about USD 55 billion. The most significant was production of bio-alcohols and bio-polymers (TechNavio, 2014).

In line with the EU strategy for the development of bio-economy, it is a strategic, integrating, cross-sectoral form of activity, which is consistent with interdisciplinary approach to the principles of planning and funding for research. Bio-economy also covers the issues of energy obtained from renewable sources and manufacturing processes of industries such as textile and paper industries as well as, partially, chemical, cosmetic and pharmaceutical industries. These integrating features of bio-economy will be crucial for the future of the EU as a centre of business and technology (European Commission, 2012). These issues are similarly defined in the United States White Paper on Bioeconomy (The White House, 2012). The use of plant, animal and micro-organism resources, with

the support offered by biotechnology, genetics, chemistry and economics, may bring the expected results to the consumers and the EU economy but also to other regions of the world but so far the importance of this sector in the economies of various countries is small.

In Poland, the most important directions of research in the field of bio-economy are as follows (Kolesinska, 2015):

- developing processes for obtaining energy and chemicals with high value added from biomass derived from waste and vegetation using industrial biotechnology methods;
- obtaining new biomaterials and polymer composites of controllable biodegradability based on cellulose nanofibers and bio-nano-cellulose;
- developing technologies for obtaining new biocatalysts and biocatalyst mimetics for the production of fuel and organic chemical compounds of substantial industrial significance (platform molecules) from biomass;
- developing biotechnological processes for producing functional foods useful in preventing and treating diet-related diseases;
- developing new ways of integrating fermentation and bioconversion processes with product separation, purification and batching;
- developing biorefinery processes based on waste and renewable resources.

In short-term perspective, R&D activity in Poland in the area of bio-economy shall be mainly focused on 1) strengthening innovativeness and increasing competitiveness of food industry; 2) developing technologies for conversion of second generation biomass (residues from food industry, household and municipal wastes) into biofuels and raw industrial materials (Bielecki, 2014).

Latvia is among the countries, which, like Poland, put an emphasis on knowledge-intensive bio-economy, biomedicine and biotechnology,

within the intelligent specialisations (OREANDA-NEWS, 2015). Development of bio-economy may also give an impulse for development of local links between cities and their surrounding rural regions (Bulderberga, 2015) and for reducing greenhouse gas emissions, e.g. by producing energy from manure and waste (Popluga, Naglis-Liepa, Kaspars and Lenerts, 2015). So not only an economic evaluation of biogas production is important but also its assessment from the ecological perspective (Morken, Fjorttoft and Briseid, 2015). Production of bio-energy is currently unprofitable without public support related to environmental objectives pursued in the production of bio-energy.

Total growth in demand for food is anticipated on a global scale. Over 58% of the agricultural crop production is intended for food, 37% for animal feed and 5% for bio-fuels. Increasing production of biofuels is an activity in competition with food production. It is recommended that energy is produced from second- and third-generation raw materials such as waste and non-food products, bacteriophages, microalgae, and, finally, fourth-generation raw materials, i.e. genetically modified plants.

Production of energy from biomass is currently the only sphere of innovative bio-economy, which has developed on an industrial scale. It is also characterised by the lowest value added. This concerns the use of solid biomass and production of bio-ethanol, bio-diesel and biogas. Production of first-generation biofuels from products, which can be processed into food, and special agricultural production competing with food production is less and less supported. It is emphasized the need for production of biofuels from waste, by-products and special production, like algae that is second- and third-generation raw materials. The technological progress of production of bio-diesel from algae is significant and there are already industrial technologies available (Yu et al., 2009; Schenk et al., 2008). As of energy production from solid biomass, still

a big limitation is the organisation and costs of transportation and storage (Rentizelas, Tolis and Tatsiopoulos, 2009). Large power plants require oil to be transported over long distances (Gostomczyk, 2012), while with the transport over a distance of more than 50 km, production of biomass from willow (*Salix* spp.) is unprofitable (Krzyzaniak, Stolarski, Szczukowski and Tworkowski, 2013). Eco-friendly production of energy from both the municipal and the industrial biological waste becomes more and more important (Parker, Fan and Ogden, 2010).

As indicated above, in addition to agriculture, food processing and forestry, bio-economy sectors, in which the production on an industrial scale is carried out, include primarily bio-energy sector.

Bio-economy has two pillars. The traditional one encompassing forestry, agriculture and food processing, and the modern one, associated with production of bio-energy and bio-materials, for example. The data concerning the entire sector based on biomass are not available. Therefore, for the purpose of this study, the importance of bio-economy in the national economy was defined as the sum of the sectors of economy, for which statistical records exist. Production of energy from biomass was described separately, pointing to its importance in the energy sector and the prospects for its development.

Goal and methods

The aim of the study is to determine the importance of bio-economy and its structure in Poland. The research tasks are as follows: 1) to determine volume of the bio-economy sector in Poland; 2) to determine the share of bio-economy in the overall economy; 3) to determine the importance of new sectors of bio-economy and the dynamics of their development.

The analysis covered the years 2000-2014. In this paper were used statistical data provided by the Central Statistical Office (GUS) and data provided by the Agricultural Market Agency, which supervises the biogas market. In terms of

the values, data are presented in nominal values, and the importance of the sector was assessed on the basis of its share in the economy.

In the assessment of bio-economy in the Polish economy, the following criteria were taken into account: share in global production, share in gross value added in the economy, share in fixed assets in the economy, share in employment and share in foreign trade. With regard to bio-energy market, in article is presented information about the volume of bio-energy production by source, the dynamics of growth of bio-energy production and its share in the energy supply in Poland.

Research results

In Poland, agriculture still plays an important role in the national economy, although year after year its importance decreases. It is a major branch of bio-economy, which provides raw materials of biological origin for further processing. Another important sector is agri-food processing industry and the following one is forestry. Table 1 shows the volume and share of the bio-economy sector in Poland. Global production volume, gross value added, gross fixed assets used in the sector as well as foreign trade turnover have increased in both nominal and real terms. In the analysed period, real increase in the global production volume and gross value added in agriculture was more than 25% and more than 60% in agri-food processing industry. In the same period, the gross value added in the Polish economy increased by 65%, so the relative share of bio-economy decreased.

Global production volume in bio-economy in 2014 amounted to more than PLN 340 billion (approx. USD 92 billion) that is 10% of global production volume in the Polish economy. Even greater was the importance of the sector for the employment, near 20%. This is so mainly due to

fragmented agriculture, which employs more than 80% of the workers in the bio-economy sector. Another important area is foreign trade. Export generated by the sector was as much as 9.5% of the total Polish export. There was observed a positive balance of trade in products of the sector, which in 2014 amounted to about USD 12 billion. Polish foreign trade recorded a negative balance: USD -3.6 billion.

In 2014, the share of bio-economy sector in creating the gross value added was 6.2%. Its importance decreased steadily from 2000 to 2014 on an annual average of 2.3%. Its importance in fixed assets and employment was decreasing at similar pace. Only for foreign trade there was recorded a growing trend. On an annual average export grew by 1.7% and import by 2.1%.

Figure 1 shows changes in the bio-economy structure in the years 2000-2014. The structure of the bio-economy has become more modern. In 2000, the share of agriculture in generating gross value added was 57% and in 2014 as little as 41%. The role of food processing increased during this period from 39% to 53%. Forestry share remained at a similar level. Structure of the employment in bio-economy was quite different. As many as 83% of the employees worked in agriculture. Work efficiency in agriculture amounted to only 18% of the average productivity in the economy and in the processing sector and forestry it was close to the average. Low work efficiency will remain as long as there is no closer relationship between the agricultural enterprises and the market (Golebiewska, 2011). A limitation for rapid changes in agriculture is also low production profitability (Wicka et al., 2013).

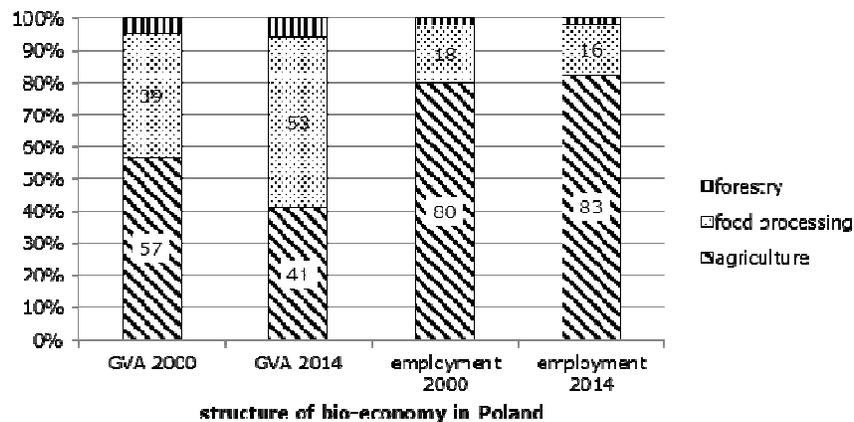
Table 1

**The size and the share of bio-economy sector in Polish economy in the years
2000-2014**

Year	Size of bio-economy sector in Poland						Share of bio-economy sector in national economy in Poland					
	gross pro- duction	GVA	fixed assets	export	import	no. of employees	gross production	GVA	fixed assets	export	import	no of employees
	in PLN billions (nominal value)					in million	in percent					
2000	179	57.5	155	16.5	15.6	4.8	12.3	8.7	13.4	12.0	7.3	31.7
2001	184	59.6	158	17.1	15.8	4.8	12.0	8.6	13.0	11.6	7.6	32.5
2002	184	55.8	164	18.8	16.6	2.6	11.7	7.8	10.2	11.2	7.4	20.5
2003	193	56.9	168	24.7	18.0	2.6	11.7	7.7	10.0	13.2	6.8	20.5
2004	221	68.4	172	29.0	20.0	2.6	11.9	8.4	9.8	10.6	6.1	20.4
2005	218	68.3	178	37.3	25.6	2.6	11.2	7.9	9.7	12.9	7.8	20.0
2006	234	72.5	184	42.7	29.2	2.6	10.9	7.8	9.6	12.4	7.4	19.6
2007	274	79.3	192	48.2	35.3	2.6	11.4	7.7	9.3	12.5	7.7	18.9
2008	274	74.6	199	49.8	40.6	2.6	10.4	6.7	8.9	12.3	8.2	18.4
2009	282	80.8	207	58.8	44.0	2.6	10.5	6.8	8.7	13.9	9.5	18.6
2010	282	86.0	213	64.0	48.1	2.8	9.9	6.9	8.5	13.3	9.0	20.0
2011	326	97.5	231	73.4	56.9	2.8	10.4	7.3	8.6	13.1	9.1	19.8
2012	332	90.7	233	86.8	61.9	2.8	10.1	6.3	8.1	14.4	9.5	19.9
2013	344	95.1	243	98.5	64.6	2.8	10.3	6.5	7.9	15.2	9.8	19.7
2014	343	94.9	254	105. 9	69.0	2.8	10.0	6.2	7.8	15.3	9.8	19.4
Annual avg. change (%)	-	-	-	-	-	-	-1.5	- 2.3	-3.8	1.7	2.1	-3.4

In 2015 the exchange rate was: 1 USD = 3,75 PLN

Source: authors' calculation based on statistical data of the Central Statistical Office of Poland



Source: authors' calculation based on statistical data of the Central Statistical Office of Poland

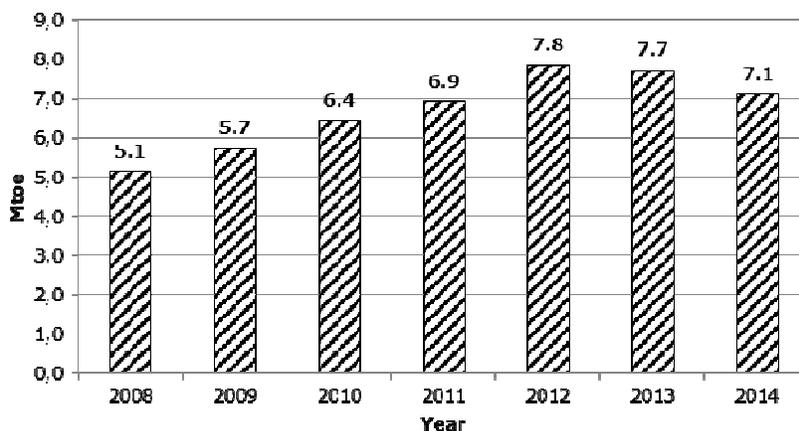
Fig. 1. Internal structure of bio-economy in Poland in 2000 and 2014

The visible importance of bio-economy in the Polish economy and its internal structure show that it is still a significant part of the economy. The volume of this sector will increase in real terms, mainly due to the increasing role of industrial processing. The most important area of processing is production of food, followed by production of energy. Bio-economy share in the national economy will be decreasing to around 4% of GDP.

In Poland, there are no available statistics to determine separately the importance of biofuels, biochemicals, bio-pharmaceuticals and bio-based construction materials. Production of liquid biofuels is classified to the agri-food processing industry. However, one can determine the growth of volume of production of biofuels, which are produced on an industrial scale. In other areas, the production has not even gone out beyond the laboratory stage.

Production of energy from biomass in Poland is based on four groups of raw materials. These include: solid biomass, bio-ethanol, bio-diesel

and biogas. Data for the entire Poland are available from 2008. In the years 2008-2014, energy production based on the raw materials of biological origin increased (Figure 2). In 2008, it was 5.1 Mtoe (toe – tonne of oil equivalent) and in 2014 as much as 7.7 Mtoe. The largest share in the structure of the generated energy was the energy produced from solid biomass, in 2008 there was 92% and in 2014 - 87%. This was primarily biomass produced from wood achieved in forestry and from straw. Share of energy from bio-diesel and bio-ethanol increased rapidly but it still did not exceed 10% (Table 2). The share of biomass raw materials in the production of electricity from renewable energy sources increased significantly, from 28% in 2004 to 50% in 2014. The overall share of energy produced from biomass is approximately 84% of renewable energy in Poland.



Source: authors' calculation based on statistical data of the Central Statistical Office of Poland (GUS 2015)

Fig. 2. Volume of energy production form bio-renewable sources in the period 2008-2014 in Poland

Table 2

**Structure of energy production from bio-renewable sources in Poland in the period
2008-2014 (in percent)**

Year	Share of energy produced from bio-sources (in percent)			
	solid biomas	biodiesel	bio-ethanol	biogas
2008	92.4	4.6	1.1	1.9
2009	90.8	5.9	1.6	1.7
2010	91.1	5.4	1.7	1.8
2011	91.8	4.8	1.4	2.0
2012	89.2	7.1	1.6	2.1
2013	88.6	7.5	1.6	2.4
2014	86.7	9.2	1.3	2.9

Source: authors' calculation based on statistical data of the Central Statistical Office of Poland (GUS 2013, GUS 2014, GUS 2015)

It is important that production of bio-energy does not compete with production of food and there are used the second-generation biofuels. In Poland, the share of energy produced from agricultural raw materials is still large. This concerns, in particular, production of bio-diesel and bio-ethanol and, partially, also production of biogas. Production of bio-diesel in Poland increased from 263 thousand tonnes in 2008 to 740 thousand tonnes in 2014. Given that the yield of rapeseed oil is 40%, whereas 1.63 million tons of rapeseed are required for production of bio-diesel. With the average yield of about 2.85 tonnes per 1 ha in Poland, about 570 000 ha of land is needed to produce the sufficient amount of bio-diesel.

Productivity of bio-ethanol from cereal raw materials is about 340 litres per 1 tonne (Kaszkowiak and Kaszkowiak, 2013). In order to produce bio-ethanol consumed in Poland for energy purposes (91 thousand tonnes in 2014) are required 335 thousand tonnes of cereal grains. With the average yields of cereals amounting to 3.6 tonnes per 1 ha in Poland, the area of cereal production for bio-ethanol is 93 thousand ha. The area for production of bio-diesel and bio-ethanol should cover 660 thousand ha of the arable land. It is 6% of the arable land in Poland. This production competes with food production. It is also pointed out that it is

inefficient in terms of energy-saving (Dobek, 2007; Dobek et al., 2010). The energy produced from such biofuels covers only energy consumption for its production. A surplus of energy could be gained only by burning, in addition, the straw from rape and cereals.

In 2014, production of agricultural biogas in Poland was carried out in 58 agricultural biogas plants and amounted to 174 million cubic meters of biogas (ARR, 2015), i.e. 38.9 thousand toe. Agricultural biogas represented around 30% of the biogas production in Poland. Another part of production of biogas in landfills and waste water treatments, together totalling to 140 thousand toe. Share of biogas in production of energy from renewable sources is about 2.9%, and in total energy production – only 0.09%.

Production of biogas in agricultural biogas plants is based on the use of waste and specially produced vegetable raw materials (e.g. silage maize). In 2014, 2.1 million tonnes of raw materials were used in agricultural biogas plants. The raw materials included: manure (about 30%), waste from food industry (40%) and silage maize (30%). The overall area of production of silage maize to be used as an input to biogas plants is 7000 ha that gives an average of 120 ha per 1 biogas plant. The biogas plants processed manure from about 28 thousand large units of animals. This is the amount of manure

that can be produced by 170 thousand pigs for fattening (1.8% of the pig population in Poland). Both the area for production of raw materials and the share of the manure processed show that importance of agricultural biogas production in Poland is small. Considering the current prices of energy and green certificates in Poland it is not a profitable production, with zero profitability (Ciurzynski, 2014) and the prospects of price changes are not satisfactory (Biomasa Magazine, 2016).

Conclusions

Bio-economy sector in Poland has a traditional structure and is still quite important in the overall economy. Its share in generating gross value added is about 6.5%, in employment as much as 19% and in foreign trade: 15% in export and 10% in import. The importance of the sector in the years 2000-2014 decreased by about 2% on an annual average. Global annual production volume of the sector is about USD 90 billion. The structure of bio-economy is dominated by traditional sectors: agriculture, food processing industry and forestry. The importance of agriculture decreases and in 2014 it fell to a 41% share in the sector. The importance of food processing increased – from 39 to 53% GVA of the sector.

Production in the innovative areas of bio-economy is still small and relates primarily to production of energy from biomass. There is currently no plant for processing biomass into

products with higher value added. These technologies are still in the experimental stage.

Production of energy from biomass in Poland increases. In 2014, energy from biomass was 9.9% of total energy production. Its primary source was the solid biomass, mainly from forestry, which represents as much as 87% of the total volume. Production of bio-ethanol and bio-diesel (9.2% and 1.3%) and production of biogas (2.9%) are of less importance. In Poland, agricultural raw materials for production of biofuels are produced in about 6% of the arable land. The main direction of development of bio-energy production should be production from waste, including waste from agriculture.

Production of agricultural biogas in Poland is small. Only 0.9% of energy is produced from biomass. Development of this production is not profitable without public support, which should be compensated by the environmental effects, including reduction of GHG emissions. In Poland, biogas plants process only 2% of manure.

Development of bio-economy in Poland should be based on production of bio-energy from second- and third-generation biomass and production of products with high value added, e.g. bio-polymers. Innovative areas of bio-economy in Poland are still in the initial stage of development. Production on an industrial scale does not exist. A major limitation may be low competitiveness of these technologies in terms of cost.

Bibliography

1. ARR. (2015). *Sprawozdanie z dzialalnosci Agencji Rynku Rolnego w 2014 r. (The report on the activities of Agricultural Market Agency in 2014.)* Warszawa: Agencja Rynku Rolnego.
2. Bielecki, S. (2014). Bioeconomy in Poland - Open Opportunities. *3rd Bioeconomy Stakeholder Conference*, Turin October 8-9, 2014. Turin.
3. Biomasa Magazine. (2016). Bedzie rezerwa zielonych certyfikatow dla biogazowni (There Will Be the Reserve of Green Certificates for Biogas). *Magazyn Biomasa (Biomasa Magazine)*. Retrieved: <http://magazynbiomasa.pl/bedzie-rezerwa-zielonych-certyfikatow-dla-biogazowni/>. Access: 1.20.2016.
4. Bukowski, M., Szpor, A., Sniegocki, A. (2012). Drzemiaczy tygrys, spetany orzel. *Dylematy polskiej debaty o polityce innowacyjnej (Napping Tiger, Eagle Hindered. Dilemmas of Polish Debate on Innovation Policy)*. Warszawa: Instytut Badan Strukturalnych (Institute for Structural Research).
5. Bulderberga, Z. (2015). Forecasted Outcomes of Latvian Regional Policy's Implementation in Municipalities. In: In Proceedings of the 25th NJF Congress. *Nordic View To Sustainable Rural Development*. Riga: NJF Latvia, pp. 472-480.
6. Chylek, E., Rzepecka, M. (2011). Biogospodarka – konkurencyjnosc i zrownowazone wykorzystanie zasobow (Bio-economy - Competitiveness and the Sustainable Use of Resources). *Polish Journal of Agronomy(7)*, pp. 7-13.

7. Ciurzynski, L. (2014, 10 9). Ile mozna zarobic na biogazie, czyli oplacalnosc biogazowni (How Much You Can Earn on Biogas, or the Profitability of Biogas Plants). *Magazyn Biomasa (Biomasa Magazine)*. Retrieved: <http://magazynbiomasa.pl/ile-mozna-zarobic-na-biogazie-czyli-oplaczalnosc-biogazowi/>. Access: 3.01.2016.
8. Dobek, T. (2007). Ocena efektywnosci ekonomicznej i energetycznej produkcji pszenicy ozimej i rzepaku ozimego wykorzystanych do produkcji biopaliw (Evaluation of Economic Effectiveness and Power Consumption for Farming of Winter Rapeseed and Winter Wheat Utilized for Biofuel Production). *Inzynieria rolnicza (Agricultural Engineering)*, (6 (94)), pp. 41-48.
9. Dobek, T., Dobek, M., Sarec, O., (2010). Ocena efektywnosci ekonomicznej i energetycznej produkcji pszenicy ozimej i rzepaku ozimego wykorzystanych do produkcji biopaliw (Assessment of Economic and Energy Efficiency for the Production of Winter Wheat and Winter Rape Used to Manufacture Biofuels). *Inzynieria rolnicza (Agricultural Engineering)*, (1(119)), pp. 161-168.
10. European Commission. (2012, 2 7). *Why the Bioeconomy Matters. European Commission workshop outlines the Bioeconomy's impact in our lives*. Retrieved: http://ec.europa.eu/research/bioeconomy/pdf/120207_european_commission-bioeconomy-workshop_en.pdf. Access: 4.01.2016.
11. European Commission. (2012, 2 13). *Innowacje w sluzbie zrownowaznego wzrostu: biogospodarka dla Europy (Innovating for Sustainable Grow: A Bioeconomy for Europe)*. (COM2012(60)). Brussel: European Commission.
12. Golebiewska, B. (2011). Significance of Connections with the Environment of Agricultural Farms in Poland for their Production and Economic Situation. *Economic Science for Rural Development - Production and Taxes*, (24), pp. 40-49.
13. Golebiewski, J. (2013). Value Chains Within Bioeconomy. *International Scientific Electronic Journal "Earth Bioresources and Life Quality"*, (4), pp. 1-15. Retrieved: <http://gchera-ejournal.nubip.edu.ua/index.php/ebql/issue/current>. Access: 16.01.2016.
14. Golebiewski, J. (2014). Biogospodarka jako inteligentna specjalizacja regionow w Polsce (Bioeconomy as a Smart Specialization of Regions in Poland). *Przedsiębiorczość i Zarządzanie (Entrepreneurship and Management)*, Vol. 15, z. 8, part 1, pp. 55-69. Retrieved: <http://piz.san.edu.pl/docs/e-XV-8-1.pdf>. Access: 18.01.2016.
15. Golebiewski, J. (2015). Zrownowazona biogospodarka – potencjal i czynniki rozwoju (Sustainable Bio-economy - the Potential and Development Factors). In: (Czyzewski, A., Klepacki, B. eds.) *Problemy rozwoju rolnictwa i gospodarki zywnosciowej w pierwszej dekadzie czlonkostwa Polski w Unii Europejskiej: IX Kongres Ekonomistow Polskich (Problems of Development of Agriculture and Food Economy in the First Decade of Polish Membership in the European Union: IX Congress of Polish Economists)*. Warsaw: Polskie Towarzystwo Ekonomiczne, pp. 344-362.
16. Gostomczyk, W. (2012). Organizacja systemu logistycznego w produkcji i wykorzystaniu biomasy energetycznej (The Organization of the Logistic System in the Production and Use of Biomass Energy). *Logistyka (Logistics)*, (4), pp. 939-946.
17. GUS. (2014). *Energia ze zrodel odnawialnych w 2013 r. (Energy from Renewable Sources in 2013)*. Warsaw, Polska: Glowny Urzad Statystyczny (Central Statistical Office of Poland), p. 69.
18. GUS. (2015). *Energia ze zrodel odnawialnych w 2014 r. (Energy from Renewable Sources in 2014)*. Warszawa, Polska: Glowny Urzad Statystyczny (Central Statistical Office of Poland), p.68.
19. Kaszkowiak, E. i Kaszkowiak, J. (2013). *Plon i wydajnos bioetanolu z kukurydzy w warunkach gleb lekkich (The Yield and Efficiency of Bio-ethanol From Corn in the Conditions of Light Soils)*. Inz. i Ap. Chem. (Chemical Engineering And Equipment), 52(2), pp. 56-57.
20. Kolesińska, B. (2015, 5 7). *University for the Bio-Economy*. Retrieved: The Warsaw Voice online: <http://www.warsawvoice.pl/WVpage/pages/articlePrint.php/28053/article>. Access: 4.01.2016.
21. Krzyzaniak, M., Stolarski, M., Szczukowski, S., Tworkowski, J. (2013). Ekonomiczne aspekty produkcji biomasy wierzby w jednorocznym i trzyletnim cyklu zbioru (Economic Aspects of Willow Biomass Production in Annual and Triennial Harvest Cycle). *Rocz. Ekon. Rol. i Rozw. Obsz. Wiejskich (Annals of Agricultural Economics and Rural Development)*, 100(1), pp. 211-119.
22. Maciejczak, M. (2015). How To Analyze Bioeconomy? *Roczniki Naukowe, Stowarzyszenie Ekonomistow Rolnictwa i Agrobiznesu (Annales of Polish Association of Agricultural and Agribusiness Economists)*, vol. XVI(6), pp. 165-171.
23. Maciejczak, M., Hofreiter, K. (2013). How To Define Bioeconomy? *Roczniki Naukowe Stowarzyszenia Ekonomistow Rolnictwa i Agrobiznesu (Annales of Polish Association of Agricultural and Agribusiness Economists)*, vol. XV(4), pp. 243-248.
24. Morken, J., Fjortoft, C., Briseid, T. (2015). *Agricultural Biogas Plants - Energy Balance*. In Proceedings of the 25th NJF Congress. Nordic View To Sustainable Rural Development. Riga: NJF Latvia, pp.370-374.
25. OREANDA-NEWS. (2015, 5 29). Latvia to Become European Centre for Innovation and Research for One Week. *Международные экономические новости (International Economic News)*.
26. Parker, N., Fan, Y., Ogden, J. (2010). *From Waste to Hydrogen: An Optimal Design of Energy Production and Distribution Network*. Transportation Research Part E, Logistics and Transportation Review, 46(4), pp. 534-545.
27. Patermann, C. (2008, 10 1). *The Knowledge-Based Bio-Economy - from Concept to Practice: Experiences in Germany - Particularly in North-Rhine Westphalia - and Europe*. Retrieved: Webpage of Kassel University - Ost-West-Wissenschaftszentrum, documents from V International Symposium "EU-Russia": http://www.owwz.de/fileadmin/Biotechnologie/BioVeranst/Pushchino_2008/Patermann.pdf. Access: 14.01.2016.
28. Popluga, D., Naglis-Liepa, K, Lenerts, A. (2015). Latvia's Progress Towards Agricultural GHG Mitigation. In Proceedings of the 25th NJF Congress. *Nordic View To Sustainable Rural Development*. Riga: NJF Latvia, pp. 265-269.
29. Rentzelas, A., Tolis, A., Tatsiopoulou, I. (2009). Logistics Issues of Biomass: the Storage Problem and the Multi-biomass Supply Chain. *Renewable and Sustainable Energy Reviews*(13), pp. 887-894.

30. Schenk, P., Thomas-Hall, S., Stephens, E., Marx, U., Mussnug, J., Posten, C., Hankamer, B. (2008). Second Generation Biofuels: High-efficiency Microalgae for Biodiesel Production. *Bioenergy Research*, 1(1), pp. 20-43.
31. SeeNews. (2015, 10 22). AEBIOM Sees Bioenergy Growing by 33 Mtoe by 2020. *SeeNews Renewables*.
32. Tapscott, D., Williams, A. (2011). Makrowikinomia. *Reset swiata i biznesu (Macrowikinomics: Rebooting Business and the World)*. Warszawa: Studio Emka, p. 432.
33. TechNavio. (2014). *Global Green Chemicals Market 2014-2018*. Infiniti Research Limited, p. 71.
34. TechNavio. (2015). *Global Biorefinery Market 2015-2019*. Infiniti Research Limited, p. 117.
35. TechNavio. (2015b). *Global Bio-Polypropylene Market 2015-2019*. Infiniti Research Limited, p. 70.
36. The White House. (2012). *National Bioeconomy Blueprint*. Washington DC: The White House.
37. Wicka, A., Golebiewska, B., Golebiewski, J., Jedrzejczyk, I., Kobus, P., Wicki, L., Wojciechowska-Lipka, E. (2013). Czynniki i mozliwosci ograniczania ryzyka w produkcji roslinnej poprzez ubezpieczenia (Factors and Possibilities of Reducing the Risk of Crop Production Using Insurance). Warszawa: Wydawnictwo SGGW, p. 271.
38. Wicki, L., Grontkowska, A. (2015). *Zmiany znaczenia agrobiznesu w gospodarce i w jego wewnetrznej strukturze (Changes of the Importance of Agribusiness in the Economy and in Its Internal Structure)*. Roczn. Nauk Ekonomii Rolnictwa i Rozwoju Obszarow Wiejskich (Annals of Agricultural Economics and Rural Development), 102(3), pp. 20-32.
39. Yu, G., Zhang, Y., Schideman, L., Funk, T., Wang, Z. (2009, October 11-14). Bio-crude Oil Production From Microalgae Through Hydrothermal Process. *Bioenergy Engineering*(11-14).

BIOECONOMY AS A COMPLEX ADAPTIVE SYSTEM

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Abstract. The bioeconomy is recognized as a large system that binds together natural resources, technologies, markets, people and policies. It actively and continuously establishes links between industries, both old, that for a long time form a chain of added values and new, that previously had no connections, forming a symbiotic relationship where one industry utilizes the by-products of another. The paper describes this system in a dynamic approach, as a complex adaptive system. Complexity results from the inter-relationship, inter-action and inter-connectivity of elements within a system and between a system and its environment. Based on the empirical evidences from the European Union it is argued that bioeconomy as a platform networking several branches of economy could adapt to the changes that take place in the environment.

Key words: bioeconomy, complex adaptive systems, renewable resources, efficiency.

JEL code: L11, L50, Q01

Introduction

The concept of bioeconomy is recognized as not only a promise but also a solid and realistic foundation of achieving the sustainability needs worldwide. The idea is to cluster by different socio-economic processes both traditional and innovative sectors of economies that focus on the use of renewable resources, and by applying knowledge and innovative technologies, deliver products and services, through achieving objectives important from private and public point of view. The bioeconomy is also recognized as a large system that binds together natural resources, technologies, markets, people and policies. It actively establishes links between industries, both old, that for a long time form a chain of added values and new, that previously had no connections, within a new, symbiotic relationship where one industry utilizes the by-products of another. As such bioeconomy is perceived very holistically in a wide systemic approach.

However, it is necessary to see this system not in a static way but apply more dynamic approach (Maciejczak M. and Hofreiter K., 2013). This is due to the dynamic and turbulent internal and external changes that practically prevent the achievement of Pareto optimum. Therefore, bioeconomy can be considered as a complex adaptive system. Complexity results from the inter-relationship, inter-action and inter-connectivity of elements within a system and

between a system and its environment. Complexity economics is considered as a mirror inversion of neoclassical theory (Levin R., 2000). Complex adaptive systems from economic perspective are characterized by Miller and Page (2007) by three main factors. Firstly, the complex economy is never in equilibrium but is constantly subjected to shocks, both exogenous and endogenous, that affect its short-term movements. Secondly, the classical law of one price fails, and there are observed short term price deviations. Finally, complex adaptive systems rarely, if ever, achieve the sort of optimality. It seems necessary to approach economic analysis of bioeconomy from a network, rather than a production and utility function perspective, when one deals with complex systems. It is argued that dynamic systems are able to adapt in and evolve with a changing environment (Golebiewska B., 2014).

The paper aims to analyze bioeconomy as a complex adaptive system. Based on the empirical evidences from the European Union countries it is argued that bioeconomy as a platform networking several branches of economy could adapt to the changes that take place in the environment. So far, the economic literature on bioeconomy issues in majority is applying the orthodox approaches from classical and neoclassical theories. The heterodox points of view are rarely undertaken. However, such approaches give the chances to analyse

bioeconomy in a holistic way, assuming not only the dynamics of the concept but also its complexity, i.e. resulting not only from current state of the art but also from its path dependency. As several authors emphasize (Stack M. and Gartland M., 2013; Wolfre D.A. and Lucas M., 2005; Garrouste P. and Ioannides S., 2001), such approach enables to see the complex picture and observe the adaptation of economic systems, including the bioeconomy.

The presented research are based on the heterodox assumptions of deductive and descriptive reasoning, and the secondary data coming from the Bioeconomy Observatory of the European Commission, using the data management tool DataM2, which is capturing statistics related to bioeconomy.

Research results and discussion

In the social sciences, it is agreed that the complexity results from the inter-relationship, inter-action and inter-connectivity of elements within a system and between a system and its environment (Levin R., 2000; Mitchel M., 2011). As such, systems are able to adopt and become known as Complex Adaptive Systems (CAS). According to Miller and Page (2007) CAS are dynamic systems able to adapt in and evolve with a changing environment. As argued by Cham (2001), it is important to realize that there is no separation between a system and its environment in the idea that a system always adapts to a changing environment. Rather, the system is closely linked with all other related systems making up an ecosystem. Within such a context, change needs to be seen in terms of co-evolution with all other related systems, rather than as adaptation to a separate and distinct environment (Vanberg V.J., 2004). Axelrod (1997) argues that what distinguish a CAS from a pure multi-agent system (MAS) are: the focus on top-level properties and features like self-similarity, complexity, emergence and self-organization. A MAS is defined as a system composed of multiple interacting agents; where

the agents as well as the system are adaptive and the system is self-similar. CAS is recognized as a complex, self-similar collectivity of interacting adaptive agents. Complex Adaptive Systems are characterised by a high degree of adaptive capacity, giving them resilience in the face of perturbation. Communication and cooperation take place on all levels, from the agent to the system level. Levin (2000) defines CAS systems in terms of three properties: diversity and individuality of components, localized interactions among these components and an autonomous process that uses outcomes of those interactions to select a subset of those components for replication or enhancement.

Day (1994) argues that when thinking of the economy as a complex system of elements the appropriate construct to understand it is the network. It is because the generated added value does not just come from the elements contained in the firm but from the connections that are forged between them. As networks evolve and produce more and better ranges of products using more productive processes, there is observed increasing value added. As shown by Vanberg (2004) firms are bundles of network connections, as are economies. Such networks cannot be fully connected or be maximally efficient, because an economic system is not a machine. Networks are constantly being created and destroyed, along with products and organizations (Jackson M. and Watts A., 2002; Rosser J., 1999).

From the point of view of economic theory, as stressed out by Metcalfe et al. (2006), complex systems theory is, essentially, a body of theory about connections, distinguishing it from conventional economic theory which is concerned with elements, supplemented by very strong assumptions about connections. Component structures in such systems evolve through a process of specialization and integration as well as the process of innovation diffusion. Foster (2004) distinguished four general properties of

an economic complex adaptive system, which includes structure, its components, connections and evolution in the historical time domain.

Having in mind the above discriminants of the bioeconomy (Maciejczak M., 2015), and agreeing that as an economic system it has a network and complex structure as well as is influenced by the path dependency, one could distinguish its following properties:

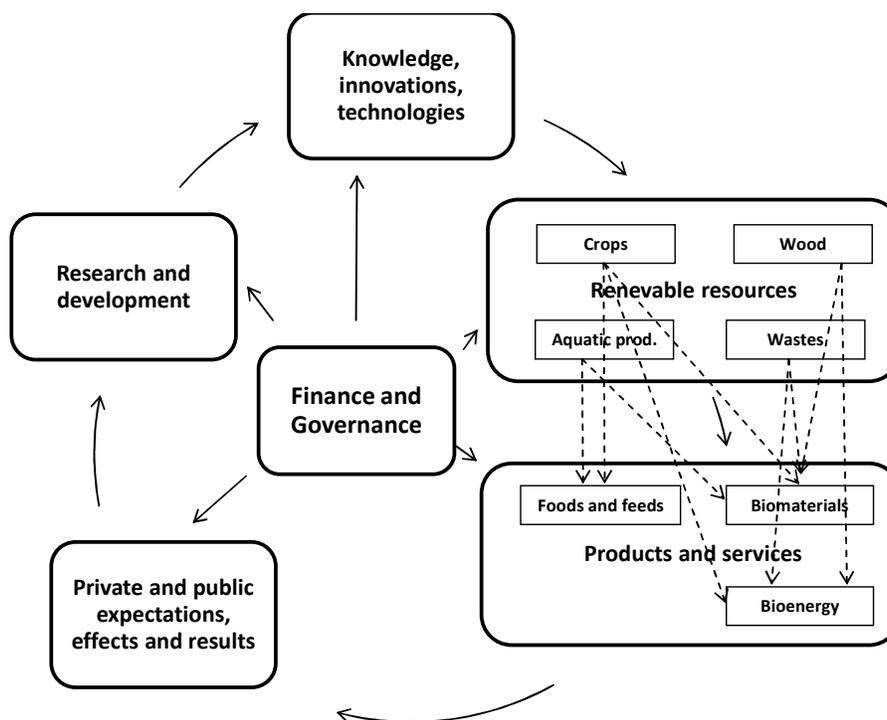
- 1) agents – as every system the bioeconomy should be recognized as a set of economic agents performing different functions, not only devoted to supply and demand but also aimed to deliver knowledge or institutional framework;
- 2) connections – every agent in the bioeconomy system performs the role that results are transmitted by the links, also with feedback loops, established in the networks, which are subject to constant changes;
- 3) transformations – this characteristic is crucial for bioeconomy as much as crucial are renewable resources and knowledge, which both are used as basic sources for any bio-processes which create private and public value added;
- 4) openness – this approach enables to obliterate the boundaries between the agent – a firm and its environment, making them more permeable, and thanks to that, transfer innovations inward and outward; firms could become more innovative cooperating with partners by sharing risk and sharing reward;
- 5) evolution – the network of bioeconomy is subject to constant changes, which not only influence its development but are influenced by all historical changes.

Figure 1 presents the conceptual model of bioeconomy as a complex system. Such system is built of agents, which are connected. In such system products and services are generated from application of knowledge and innovative technologies into production processes which base on renewable sources of biomass. By

application of non-linear models of progress development and innovation diffusion as well as being pulled by the market, the bioeconomy system can generate products and services important from private and public point of view. Both, private and public institutions finance and govern its functioning and growth.

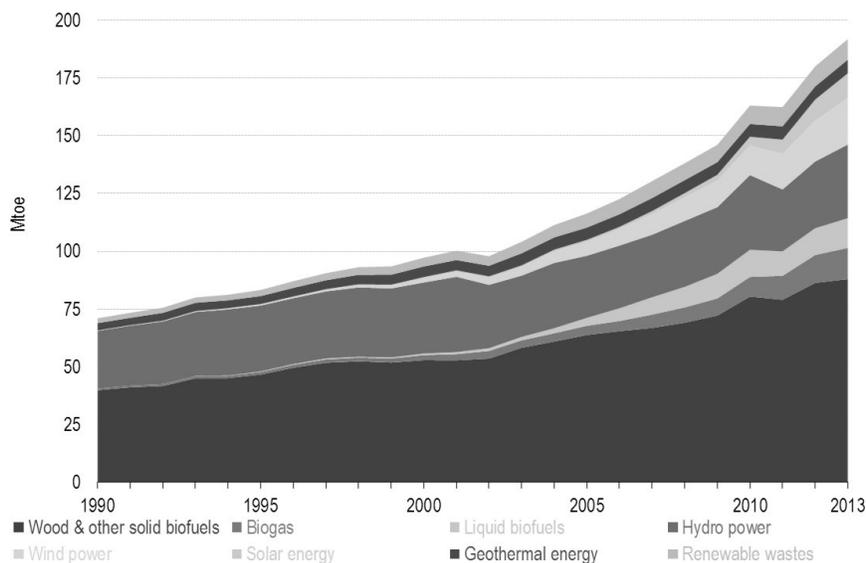
Is, however, the bioeconomy not only complex but also adaptive? To answer this question two synergetic arguments can be used. First is describing the evolution of the bioeconomy concept. The second is showing how path dependency resulted in the primary production of energy from renewable sources.

In one of the first policy agendas of the bioeconomy, namely the Cologne Paper (European Commission, 2007) bioeconomy is recognized as the production of renewable biological resources and their conversion into food, feed, bio - based products and bioenergy. Here, is provided very narrow approach which is encompassing the classical production function. In 2012, the European Commission stressed out that production paradigms of bioeconomy should rely on biological processes and, as with natural ecosystems, use natural inputs, expend minimum amounts of energy and do not produce waste as all materials discarded by one process are inputs for another process and are re-used in the ecosystem (European Commission, 2012). In the evolution of bioeconomy concept in Europe could be observed the focus not only on production but also on energy savings and circularity of renewable resources, i.e. wastes. In 2015 the Council of Nordic States – Norden, pointed out that bioeconomy is a sustainable production and use of natural resources, with a cross-sectorial and systematic approach, with a basis in circular economy (The Council of Nordic States, 2015). In this definition, being an example of the broadest approach, are emphasized the elements of governance of production and circularity of the system.



Source: author's construction

Fig. 1. The conceptual model of bioeconomy as a complex system



Source: author's construction based on Eurostat data

Fig. 2. Primary production of energy from renewable sources, EU-28, 1990-2013

Figure 2 presents the primary production of energy from renewable sources in the European Union 28 Member States, in the years 1990-2013. As the concept of bioeconomy evolved into use not only of primary sources of biomass, such as wood or agricultural crops and residues but also biomass from renewable wastes, such products were increasingly gaining higher shares

in the energy production. Similar, path dependency situation can be observed with regard to liquid biofuels or hydro power.

Conclusions and recommendations

- 1) This paper aimed to make an attempt to present and analyse bioeconomy as a complex

adaptive system. The performed analysis allow for the following conclusions:

2) The classical perspectives of perceiving and, as a consequence, analysing economy are changing from market approach of static equilibriums into industrial organizations of dynamic networks.

3) Bioeconomy as a concept gaining more and more attention of society, business, politics and academy could and should also be analysed from the perspective of more heterodox approaches, including industrial organization.

4) Bioeconomy can be presented as the complex adaptive system. The system, which using path dependency and connections between agents participating in evolving networks, is able not only to produce high added value but also adapt to the changing environment.

5) It is advisable that further research on bioeconomy as complex adaptive system should be undertaken, in order to present all spectrum of issues related to its key properties distinguished in this paper and beyond.

Bibliography

1. Axelrod, R. (1997). *The Complexity of Cooperation: Agent-Based Models of Competition and Collaboration*. Princeton University Press. Princeton. p. 139-148.
2. Chan S., (2001). *Complex Adaptive Systems, ESD.83 Research Seminar in Engineering Systems*. October 31, 2001/November 6, 2001. p. 1-9.
3. Day, R. (1994). *Complex Economic Dynamics*, Vol. 1: A Introduction to Dynamical Systems and Market Mechanisms. MIT Press. Cambridge. p. 102-110
4. European Commission (2007). *En Route to the Knowledge-Based Bio-Economy*. Cologne Paper. p. 1-23.
5. European Commission (2012). *Innovating for Sustainable Growth: A Bioeconomy for Europe*, Brussels. p. 1-9.
6. Foster, J. (2004). *From Simplistic to Complex Systems in Economics*, Discussion Paper No. 335, School of Economics. The University of Queensland. p. 1-28. Retrieved: <http://www.uq.edu.au/economics/abstract/335.pdf>. Access: 10.01.2016.
7. Garrouste, P and Ioannides S. (2001). *Evolution and Path Dependence in Economic Ideas: Past and Present*. Edward Elgar Publishing Limited. UK. p. 151-159.
8. Golebiewska, B. (2014). *Przestrzenne Zroznicowanie Powiazan Rolnictwa z Otoczeniem w Latach 2004-2012 (Spatial Diversity of Combining Agriculture with The Environment in The Years 2004-2012)*. Prace Naukowe Uniwersytetu Ekonomicznego we Wroclawiu, Issue 360, pp. 141-150 (Research Papers of Wroclaw University of Economics, Issue 360, pp. 141-150).
9. Jackson, M.O. and Watts, A., (2002). *The Evolution of Social and Economic Networks*. *Journal of Economic Theory*, Volume 106, Issue 2, pp. 265-295.
10. Levin, R. (2000). *Complexity: Life at the Edge of Chaos*. University of Chicago Press, 2nd Edition, Chicago. p. 169-179.
11. Maciejczak M. (2015). *What are Production Factors Used by The Bioeconomy? Problems of World Agriculture*, Volume 15, Issue 4, pp. 137-146.
12. Maciejczak, M. and Hofreiter, K. (2013). *How to Define Bioeconomy?* *Annals of Polish Association of Agricultural and Agribusiness Economists*, Volume 15, Issue 4, pp. 243-248.
13. Metcalfe, J. S., Foster, J., Ramlogan, R., (2006). *Adaptive Economic Growth*. *Cambridge Journal of Economy*, Volume 30, Issue 1, pp. 7-32.
14. Miller, J.H. and Page, S.E. (2007). *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton University Press. Princeton. p. 121-132.
15. Mitchell, M. (2011). *Complexity: A Guided Tour*. Oxford University Press, 1st Edition. Oxford. p. 202-211.
16. Rosser, J.B. (1999). *On the Complexities of Complex Economic Dynamics*. *Journal of Economic Perspectives*, Volume 13, Issue 4, pp. 169-192.
17. Stack, M. and Gartland, M. (2003). *Path Creation, Path Dependency, and Alternative Theories of the Firm*. *Journal of Economic Issues*, Volume 37, Issue 2, pp. 487-494.
18. The Council of Nordic States - Norden (2015). *Nordic Bioeconomy*. Retrieved: <http://www.norden.org/en/theme/nordic-bioeconomy>. Access: 15.10.2015.
19. Vanberg, V.J. (2004). *The Rationality Postulate in Economics: Its Ambiguity, its Deficiency and its Evolutionary Alternative*. *Journal of Economic Methodology*, Volume 11, Issue 1, pp. 1-29.
20. Wolfe D.A. and Lucas, M. (2005). *Global Networks and Local Linkages: The Paradox of Cluster Development in an Open Economy*. McGill-Queens University Press for Queen's School of Policy Studies. Montreal and Kingston. p. 183-195.

ANALYSIS OF THE FACTORS AFFECTING COST EFFICIENCY IN BEEF PRODUCTION IN LATVIA

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Abstract. The overall trends indicate that with increases in the world population and its incomes, the demand for meat rises. Growth is forecasted in the cattle industry in the countries with large grassland areas and suitable weather conditions. The European Union (EU) beef and veal sectors are significant: 10 % of the total value of the EU agricultural production and 13 % of the world beef and veal production. Meat cattle is one of the prospective agricultural industries in Latvia, as there are appropriate land areas, climatic conditions and experience accumulated by farms. However, meat production has to be efficient and as cheap as possible. The research aim is to analyse the beef industry and the factors affecting farm cost efficiency in Latvia. To achieve the aim, the "cost parameter equation method" was employed to identify beef production efficiency for 50 farms based on the key cost items: labour, land, capital and intermediate consumption. The research found that beef production costs significantly differed for the farms in Latvia. The reason was different labour consumption and different capital costs if measured per standard cattle unit. The farms with low labour consumption and minimum investments in fixed assets were the most efficient ones.

Key words: beef production, costs, labour, efficiency

JEL code: Q10, Q12

Introduction

From analysis of the Food and Agricultural Organisation of the United Nations data, it is clear that there has been a significant increase in global meat consumption over time driven in part by a growing world population and income increases in particular (Henchiona M. et al., 2014). Francesca Allievi, Markus Vinnari and Jyrki Luukkanenc (2015) point that "Income per capita is likely to continue to rise globally, and traditionally this has led to a shift towards the consumption of foods with higher content in animal protein, fats and sugars". It is agreed by A.Auzina (2004) who finds that "with household disposable incomes rising, the demand for meat and its products increases".

L.Kristensen, S.Støier, J.Würtz and L.Hinrichsen (2014) stress that "efficiency all the way from breeding and farming to processing and dispatch is crucial for success. Systems for optimal animal welfare will be even more important...".

Growth is forecasted in the cattle industry in the countries with large grassland areas and suitable weather conditions, for example, "the expanding New Zealand dairy cattle industry

represents a huge opportunity to produce surplus calves for the beef industry both male and female. Surplus capacity in the dairy industry could be increasingly utilised to produce more efficient beef suckler cows" (Morris S. T., Kenyon P. R., 2014). "Brazilian beef production is estimated at 10,935 million tonnes of meat in 2023, representing an increase of almost 29 % relative to 2013, and 20% of the global market share" (Lobato J. F. P. et al., 2014). In Uruguay, there is a great potential to improve the productivity of grazing livestock systems, by improving grazing management, and at the same time reducing GHG emissions, and other environmental impacts, while conserving biodiversity (Picasso V. D. et al., 2014).

Milan Zjalic, Antigoni Dimitriadou and Andrea Rosati (s. a.) from the European Association for Animal Production emphasise that the importance of the EU beef and veal sector goes beyond the economic figures, which alone are significant: 10 % of the total value of the EU agricultural production and 13 % of the world beef and veal production. The social and environmental role of the sector is equally important: sustaining rural populations and

countryside. Today's EU Common Agricultural Policy (CAP) has evolved substantially since these early efforts and is striving to tackle new challenges in search of a fairer and greener more competitive agriculture. The main aims of the CAP are to improve agricultural productivity, so that consumers can benefit from a stable supply of affordable food, while making sure that EU farmers can make a reasonable living. Since the early 1980s, there has been a steady downward trend in the number of livestock on agricultural holdings across the EU. In 2014, looking at the EU Member States, Germany, Spain, France and the United Kingdom held the largest number of livestock and there have been considerable structural changes in EU livestock farming since the 1980s. Smallholders on mixed farms have gradually given way to larger-scale, specialised livestock holdings (Eurostat, 2015). In 2003, the reform of European CAP turned the focus from quantity to better quality production. The new aim included an increased attention to sustainable agriculture and citizens' concerns, in particular towards "animal welfare" (Serviere J., 2014). Hanne Marie Nielsen, Ab Groen, Jorn Pedersen and Peer (2004) point that *"also in a situation with non-profitable bull calf production, dairy farmers will stop producing beef from bull calves. In such situations the bull calves will typically be sold to specialised beef producers shortly after birth"*.

There is potential to increase land use efficiency both by integrating the unutilised agricultural area into production and by exploiting the currently used area more efficiently. In 2012 in Latvia, permanent meadows and pastures and grasses sown in arable land occupied slightly more than 800 thou. ha or 49 % of the area declared for single area payments (Pilvere I., Nipers A., 2015), which created good preconditions for meat cattle farming. It is particularly important because in the autumn of 2014 milk purchase prices sharply fell in Latvia owing to Russia's embargo on dairy

products, which made farmers search for alternatives for milk production. Anna Jamieson (2013) points that meat cattle farming is one of the most prospective agricultural industries in Latvia. There are all the necessary preconditions for it here: an appropriate climate, vast and still unutilised areas useful for meat cattle farming, experience in farming and great opportunities to increase sales both in the domestic and in the foreign markets. The Ministry of Agriculture of the Republic of Latvia (2015) emphasises that the key objective of Latvia's meat cattle industry is to produce beef of high value and quality, to provide domestic consumers with beef produced in Latvia as well as to increase its competitiveness and exports.

Juris Plesums, Uldis Osis, Astrida Runce, Ilma Ramane, Zinta Gaile and Santa Skuja (2008) believe that in farm management the allocation of resources – the practical exploitation of land and other resources needed in production – is important, as it is associated with the principle of use of the better alternative – how to use inputs, labour, finances and products in the most efficient way. The task of an owner/entrepreneur is to identify a combination of the resources which results in the highest profit at the current moment or in a short-term. Therefore, an essential aspect in raising farm efficiency is cost reduction, as revenues, to a great extent, depend on exogenous factors.

The **research object** is beef production in Latvia, while the **research subject** is farm cost indicators in beef production.

The research aim is to analyse the beef industry and the factors affecting farm cost efficiency in Latvia. To achieve the aim, the following specific research **tasks** were set: 1) to describe the meat cattle industry in Latvia; 2) to analyse the key factors affecting farm costs in beef production.

Research methods applied

The study analysed information and data from the Central Statistical Bureau (CSB) of Latvia and data of the Farm Accountancy Data Network (FADN) of Latvia. The EU FADN is an instrument for evaluating the income of agricultural holdings and the impacts of the CAP (European Commission, 2015). Analysis, synthesis and the logical construction method were employed to execute the research tasks. In addition, the "cost parameter equation method" (CPE) was employed because an account of accounting costs did not allow objectively identifying the most efficient farms, as unpaid labour costs as well as potential revenues from an alternative use of land were not included in calculations. CPE is based on cost price calculation, by inclusion and unification of labour price, as well as land price. It is done because not all farmers do include in production costs their own (and family) labour input and very often land price is not included, supposing land is for free. So, according to the CPE method, calculations include unpaid labour costs and making the labour costs equal across farms. According to the CPE method, calculations include unpaid labour costs too, thus, making the labour costs equal across farms. Besides, it is assumed that land has an opportunity cost – the owner of land could rent it out. Accordingly, the use of land for the production of products involves costs in the form of forgone rents. Calculations of efficiency in beef production include the key cost items, measured per standard cattle unit. In identifying efficiency, the key cost items represent the key factors of production: labour, land, capital as well as intermediate consumption¹.

$$TCt = LCt + ZIt + CCt + ICt \quad [1]$$

Where:

TCt – total cost per cattle unit for a farm;

¹ Intermediate consumption is the value of goods and services used in production (Krievina, 2012).

LCt – labour cost per cattle unit for the farm;

ZIt – land opportunity cost per cattle unit for the farm;

CCt – capital cost per cattle unit for the farm;

ICt – intermediate consumption cost per cattle unit for the farm (LLU, 2015).

The way all the factors of production are combined is determined by the knowledge of every producer. The present research analysed and summarised information on the distribution of various production costs in beef production in Latvia. The calculations were based on the 2013 data for 50 FADN meat livestock farms of various sizes, whose revenue from beef sales accounted for more than 2/3 of their total revenue. A number of assumption were made for the calculations: 1) all the farms should pay equal wages per hour regardless of whether their employees are regarded as paid or unpaid labour (EUR 4.3 an hour); 2) every hectare of meadows and pastures as well as of grasses sown in arable land may be rented out by the owner. Consequently, if farmers farm their land and produce beef, there are foregone revenues (EUR 71.1 per hectare).

Novelty and topicality of the research

The present research points to necessity to produce beef in Latvia as efficiently as possible, exploiting pastures and grasslands, in order that farms could choose the most appropriate agricultural industry, as the milk purchase price has decreased since the autumn of 2014 and the farmers have to choose an alternative for milk production.

Research results and discussion

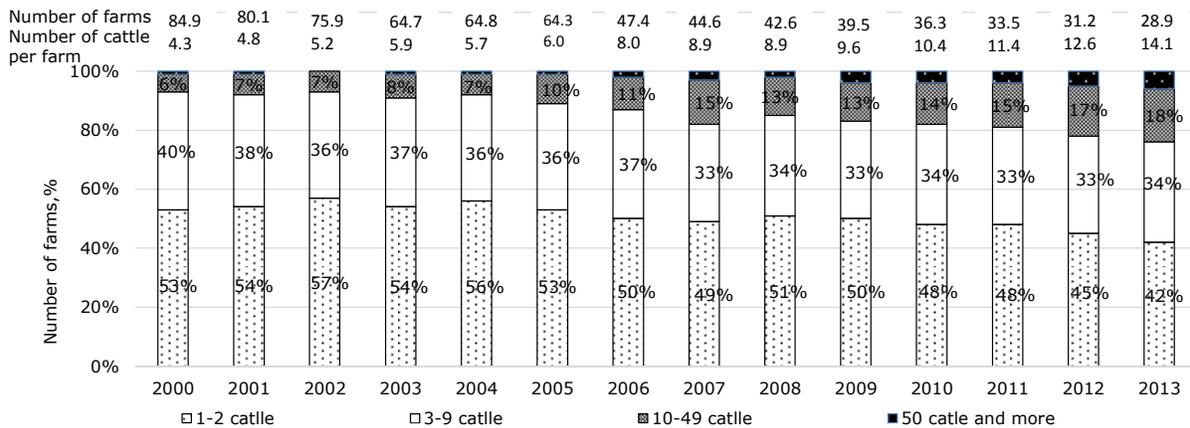
1. Characteristics of the cattle industry in Latvia

Meat cattle farming is a relatively small agricultural industry in Latvia, as its proportion in the total agricultural output in 2014 accounted for only 3.8 % (Ministry of Agriculture, 2015). To date, it developed as an auxiliary industry in milk

production (the meat of discarded dairy cows comprised almost half of the supply of beef in recent years); yet, meat cattle farming was purposefully developed as well. In 2014 in Latvia, the output of beef reached 17.9 thou. tonnes, and it has tended to decline since 2007 (-22 %). In the period since 2000, the output of beef has fluctuated from 16.0 thou. tonnes in 2002 and 16.7 thou. tonnes in 2013 to 22.8 and 22.3 thou.

tonnes (in 2007 and 2000, respectively) (CSB, 2015a).

Beef is produced in Latvia in considerably smaller quantities than pork, and the output of poultry meat too is greater than that of beef. A trend may be observed in Latvia for several years – calves are exported from the country, which are then raised in foreign countries, as the price offered by foreign dealers is higher than the domestic price on cattle raised in Latvia.



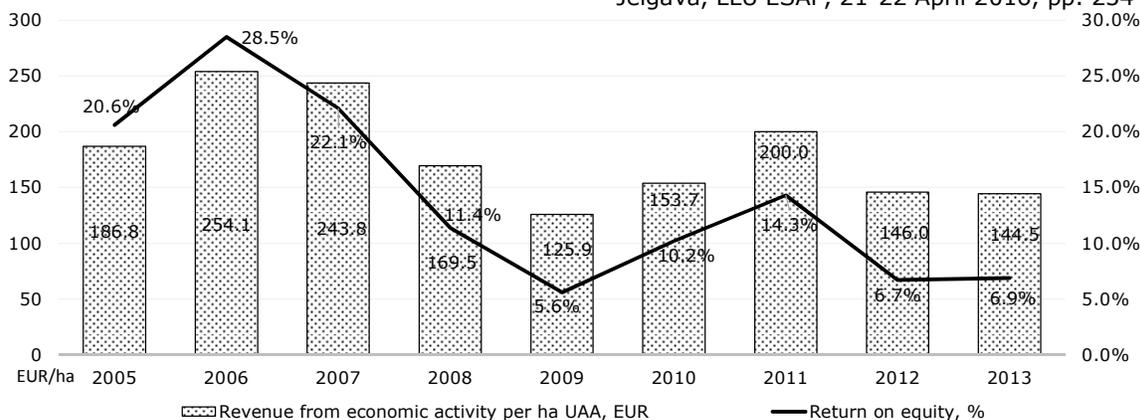
Source: authors' calculations based on CSB, 2015a, 2015b, ADC, 2015

Fig.1. Characteristics and percentage distribution of meat cattle farms in Latvia in the period 2000-2014

The total number of cattle increased to 422.0 thou. in Latvia in 2014, which was caused by an increase in the number of cattle other than dairy cows (+17 % compared with 2007) (CSB, 2015a). An analysis of changes in the number of cattle of meat breeds, according to SJSC Agricultural Data Centre (ADC) statistics, reveals that there was a strong increase trend – in 2013 in Latvia, the number of cattle of meat breeds reached 27.8 thou. (it has more than doubled since 2007), and approximately 40 % were Charolais beef cattle (ADC, 2015). The increase in the number of meat cattle indicates stability

and growth in meat cattle farming (Ministry of Agriculture, 2015).

The average farm size and the proportion of farms with a herd of 10 and more cattle continue increasing (Figure 1). The average number of cattle per farm was 14.1, while the total number of cattle farms reached 28.9 thou. in 2013. Revenue indicators for grazing livestock farms were diverse, in particular the return on equity ratio – it was considerably lower for the group of small farms with a standard output of EUR 4-15 thou. (LVAEI, 2014).



Source: authors' calculations based on LVAEI, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014

Fig. 2. Financial indicators of meat cattle farms in Latvia in the period 2005-2013

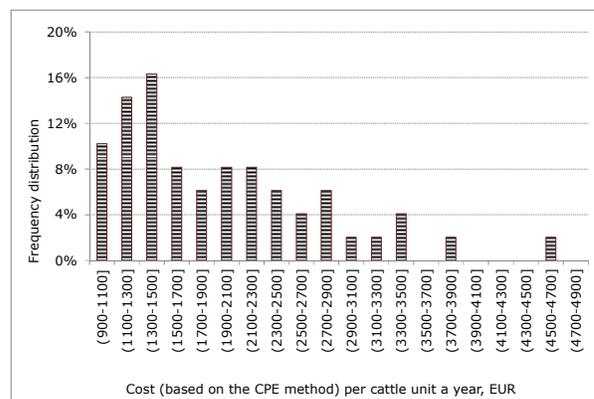
The available data on grazing livestock farms show that revenue from economic activity, which is characterised by the difference between revenues from products produced (production subsidies included) and production costs per unit of agricultural area, have been volatile and generally tended to decline. A similar trend was observed for profits (revenues have to include investment subsidies attributable to the reporting year, while expenses have to include unpaid labour cost) and return on equity ratios (Figure 2).

The purchase price of cattle has significantly risen in Latvia since 2000 (EUR 877 tonne⁻¹) and reached EUR 1624 tonne⁻¹ in 2014, although it is still low compared with the other EU Member States, which may be explained by a lower specialisation level and the small quantity of beef produced in Latvia. The highest purchase price of beef was reported in 2012, EUR 2094 tonne⁻¹. In recent years (2013 and 2014) the purchase price declined in this industry (CSB, 2015c). In Latvia, the prices of resources exploited in agricultural production tended to increase (there was a decrease during the economic crisis), including a hike price on feed (LVAEI, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014). The increase in prices on production resources considerably decreased the positive effect of high beef purchase prices. For this reason, farms have to analyse the situation in the meat cattle

industry and seek possibilities for efficient farming through reducing costs in order to offset beef purchase price decreases.

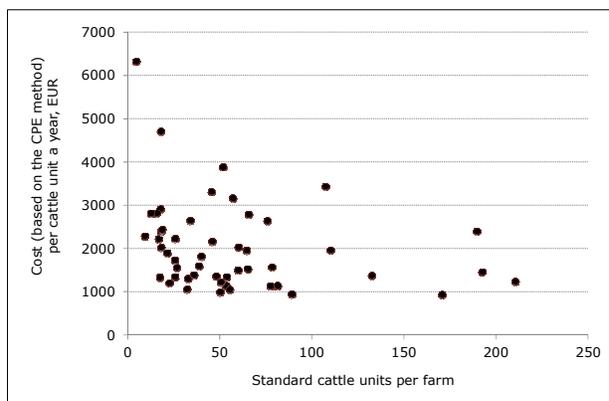
2. Analysis of the factors affecting the financial performance of meat cattle farms

An analysis of the financial performance of FADN farms shows that the range of beef production costs for farms in Latvia, based on the CPE method, is very broad (Figure 3).



Source: authors' calculations based on LVAEI, 2014

Fig. 3. Distribution of total beef production costs per cattle unit for farms in Latvia in 2013, EUR



Source: authors' calculations based on LVAEI, 2014

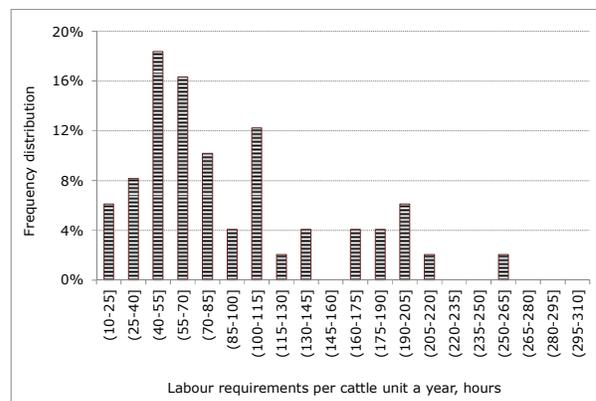
Fig. 4. Total costs depending on the number of cattle per farm in Latvia in 2013

As the average cost per standard cattle unit reaches EUR 1300-1700, and it may vary from EUR 1000 to 4700, i.e. more than four times. This means that if farms fully covered labour and land rent costs, they would incur losses, as their total cost per standard cattle unit exceeded the beef purchase price. So presently farmers do not value their own work in terms of money, and also their land is owned, which involves no rent costs.

Besides, there is no strong correlation between the size of a farm and its cost per standard cattle unit (Figure 4). An analysis of the most efficient farm in terms of the lowest production cost (based on the CPE method) shows that such a farm had 52 dairy cows and 80 standard cattle units, and its production cost equalled EUR 1122 per cattle unit. Further, the research presents the distribution of costs for the factors of production analysed and for intermediate consumption.

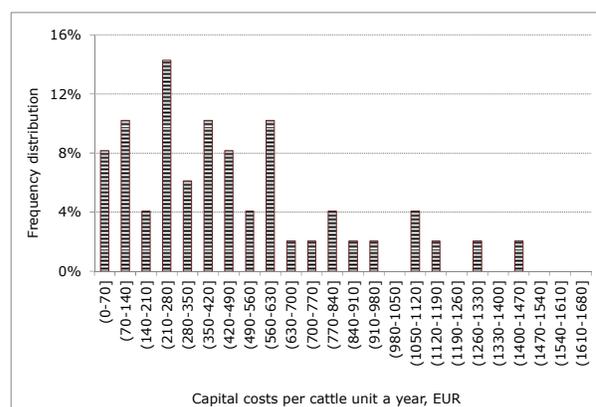
Distribution of unit labour requirements and capital costs. An analysis of unit labour requirements (Figure 5) shows that the average labour requirement per cattle unit ranged within 40-55 man-hours a year for most (18 %) of the FADN cattle farms. For 16 % of the farms, it reached 55-70 man-hours a year. However, the average labour requirement for 14 % was less than 40 and for 6 % less than 25 man-hours per cattle unit a year. At the same time, a relatively

high proportion of farms (36 %) consumed more than 100 man-hours per cattle unit a year. The significant differences may be explained by the different ways of work organisation on various farms. On the most efficient farms, the labour requirement per cattle unit a year was 12 man-hours and the total labour requirement a year was less than 1000 man-hours or approximately 2.5 man-hours a day.



Source: authors' calculations based on LVAEI, 2014

Fig. 5. Distribution of labour requirements per cattle unit in Latvia in 2013, hours



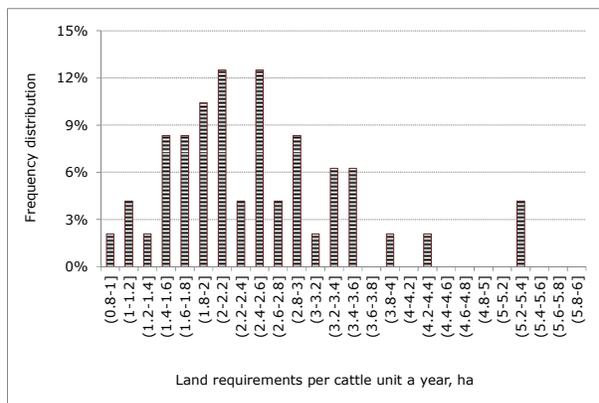
Source: authors' calculations based on LVAEI, 2014

Fig. 6. Distribution of capital costs per cattle unit in Latvia in 2013, EUR

Even greater differences were observed in the distribution of capital costs per cattle unit a year for various meat cattle farms (Figure 6). A high proportion of the farms operated at minimum capital costs – for a third, capital costs were less than EUR 240 per cattle unit. It allows them to achieve a lower production cost and compete on

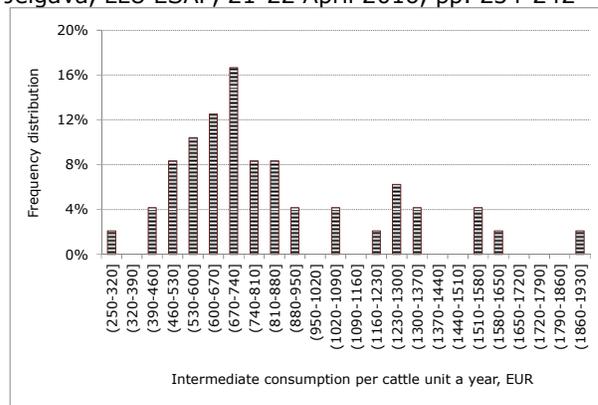
the market under falling beef prices. For about a fifth of the farms, capital costs exceeded EUR 640 per cattle unit, which decreased their production efficiency.

Distribution of unit land requirements and intermediate consumption costs. Like unit labour requirements and capital costs, unit land (meadows and pastures) requirements for various farms were diverse. This may be explained by the effects of several factors. There are differences in land quality – the higher quality and more productive land, the smaller land area is necessary to provide a cattle unit with green forage. According to the calculation methodology, a larger land area means less efficient farming. However, in practice, a larger land area is beneficial if it is owned by the farm and has no financial liabilities, as a larger land area provides larger direct area payments. Most farms in Latvia exploited a land area being greater than minimally needed – more than 60 % of the farms used more than 2 ha of land per cattle unit.



Source: authors' calculations based on LVAEI, 2014.

Fig. 7. Distribution of land requirements per cattle unit in Latvia in 2013, ha



Source: authors' calculations based on LVAEI, 2014.

Fig. 8. Distribution of intermediate consumption costs per cattle unit in Latvia in 2013, EUR

The most efficient farm had no grasses sown in arable land, and its entire land of 170 ha consisted of meadows and pastures. Of the total area, 150 ha were owned by the farm. The land was exploited quite extensively, as it was an organic farm.

The distribution of intermediate consumption costs was more compact (Figure 8) than that of the analysed factors of production (labour, capital and land), as the largest share of intermediate consumption involved purchased feed, the prices of which were similar for various farms. The farms with very high intermediate consumption mostly made emergency purchases, which might be associated with their basic activity – raising cattle. For part of the farms (18%), intermediate consumption costs per cattle unit a year ranged within EUR 450-500. However, for 40 % it ranged within EUR 350-500. Intermediate consumption costs per cattle unit a year exceeded EUR 850 for more than a fifth of the farms. The most efficient farm had a very low intermediate consumption cost. It was related to very low expenses on feed concentrate (it was used relatively little in production) as well as to very low maintenance costs of farm buildings and low operational cost of machinery and equipment, which allowed the farm to reach the lowest total cost level.

Conclusions, proposals, recommendations

1) Beef production in Latvia is a relatively small industry, as its proportion in the total agricultural output in 2014 accounted for only 3.8 %. However, there are all the necessary preconditions for it: an appropriate climate, vast and still unutilised areas useful for meat cattle farming, experience in farming and great opportunities to increase sales both in the domestic and in the foreign markets. Beef production is an alternative for milk production due to Russia's embargo on dairy products imposed in 2014 and the decrease in milk purchase prices.

2) By employing the "cost parameter equation method", it is possible to compare beef production costs per standard cattle unit for various farms, which significantly differed (more than four times) for the analysed 50 farms. The overall cost analysis revealed that farms in Latvia so far did not value the contribution of their own work to their farm in

terms of money, exploiting their owned land on which no rent has to be paid.

3) In Latvia, cattle farming costs significantly varied owing to the difference in labour consumption, as a third of the farms used 40-70 man-hours, while another third needed more than 100 man-hours per animal. Even greater differences were observed in capital costs among the farms, as a third operated at minimum capital costs, which allowed them to produce competitive products. The most efficient farms were those owning their land and exploiting meadows and pastures for raising cattle.

Acknowledgment

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Bibliography

1. Agricultural Data Centre (ADC) (2015). Meat Cattle Statistics in Latvia in the Period 2008-2013 (in Latvian). Retrieved: <http://www ldc.gov.lv/lv/statistika/parraudziba/#p2>. Access: 27.12.2015
2. Auzina, A. (2004). Regional Meat and Meat Products Market. Summary of doctoral dissertation, Jelgava, p. 89.
3. Allievi, Fr., Vinnari, M., Luukkanenc, J. (2015). Meat Consumption and Production – Analysis of Efficiency, Sufficiency and Consistency of Global Trends. *Journal of Cleaner Production*, Volume 92, 1 April 2015, pp. 142–151.
4. Central Statistical Bureau (CSB) (2015a). LLG011. Meat Production (slaughter weight, thsd tonnes). Retrieved: http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-dzivnieku-skaitis-un-lopkopibas-razosana-38208.html TARGET=_blank>Metadati. Access: 28.12.2015
5. Central Statistical Bureau (CSB) (2015b). LLG024. Grouping of Farms of All Kinds by the Number of Cattle at the End of Year. Retrieved: http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-dzivnieku-skaitis-un-lopkopibas-razosana-38208.html TARGET=_blank>Metadati. Access: 28.12.2015
6. Central Statistical Bureau (CSB) (2015c). LIG0112. Purchase Prices of Agricultural Products (euro per t). Retrieved: http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-produktu-iepirkuma-cenas-un-indeksi-38163.html TARGET=_blank>Metadati. Access: 28.12.2015
7. European Commission (2015). The Farm Accountancy Data Network public database. Retrieved: http://ec.europa.eu/agriculture/rica/database/database_en.cfm Access: 29.11.2015
8. Eurostat (2015). Agricultural Production – Animals. Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_production_-_animals. Access: 29.11.2015
9. Henchiona, M., McCarthy, M., Resconia, V.C., Troya, D. (2014). *Meat Consumption: Trends and Quality Matters*. *Meat Science*, Volume 98, Issue 3, November 2014, pp. 561–568.
10. Jamieson, A. (2013). *Baltic Beef - a Handbook for Beef Production*. Report 2013/11, Upplandsstiftelsen, p. 63.
11. Krievina, A. (2012). Value Added Creation Problems and its Increase Possibilities in Dairy Sector. Summary of doctoral dissertation, Jelgava, p. 131.
12. Kristensen, L., Stoier, S., Wurtz, J., Hinrichsen, L. (2014). *Trends in Meat Science and Technology: the Future Looks Bright, but the Journey Will be Long*. *Meat Science*, Volume 98, Issue 3, pp. 322-329.
13. Latvia University of Agriculture (LLU) (2015). Report of the Subproject "Development of Efficient Farming Models" (In Latvian), Jelgava, p. 117.

14. Latvian State Institute of Agrarian Economics (LVAEI) (2006). Agricultural Holdings. Results of Economic Analysis 2005 (FADN) (in Latvian), Riga, pp.144-209.
15. Latvian State Institute of Agrarian Economics (LVAEI) (2007). Agricultural Holdings. Results of Economic Analysis 2006 (FADN) (in Latvian), Riga, pp. 136-201.
16. Latvian State Institute of Agrarian Economics (LVAEI) (2008). Agricultural Holdings. Results of Economic Analysis 2007 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
17. Latvian State Institute of Agrarian Economics (LVAEI) (2009). Agricultural Holdings. Results of Economic Analysis 2008 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
18. Latvian State Institute of Agrarian Economics (LVAEI) (2010). Agricultural Holdings. Results of Economic Analysis 2009 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
19. Latvian State Institute of Agrarian Economics (LVAEI) (2011). Agricultural Holdings. Results of Economic Analysis 2010 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
20. Latvian State Institute of Agrarian Economics (LVAEI) (2012). Agricultural Holdings. Results of Economic Analysis 2011 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
21. Latvian State Institute of Agrarian Economics (LVAEI) (2013). Agricultural Holdings. Results of Economic Analysis 2012 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
22. Latvian State Institute of Agrarian Economics (LVAEI) (2014). Agricultural Holdings. Results of Economic Analysis 2013 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
23. Lobato, J.F.P., Freitas, A.K., Devincenzi, T., Cardoso, L.L., Tarouco, J.U., Vieira, R.M., Dillenburg, D.R., Castro, I. (2014). Brazilian Beef Produced on Pastures: Sustainable and Healthy. *Meat Science*, Volume 98, Issue 3, pp. 336-345.
24. Ministry of Agriculture (2015). Agriculture of Latvia 2015. Riga, p. 156.
25. Morris, S.T., Kenyon, P.R. (2014). Intensive Sheep and Beef Production from Pasture — A New Zealand Perspective of Concerns, Opportunities and Challenges. *Meat Science*, Volume 98, Issue 3, pp. 330-335.
26. Nielsen, H. M., Grocn, A., Pedersen, J., Berg, P. (2004). Stochastic Simulation of Economic Values and their Standard Deviations for Production and Functional Traits in Dairy Cattle under Current and Future Danish Production Circumstances. *Acta Agriculturae Scandinavica: Section A, Animal Science* 54, No. 3, pp. 113-126.
27. Picasso, V.D., Modernel, P.D., Becona, G., Salvo, L., Gutierrez, L., Astigarraga, L. (2014). Sustainability of Meat Production beyond Carbon Footprint: a Synthesis of Case Studies from Grazing Systems in Uruguay. *Meat Science*, Volume 98, Issue 3, pp. 346-354.
28. Pilvere, I., Nipers, A. (2015) Agricultural and Forest Lands in Latvia: an Analytic Assessment of their Use Potential (in Latvian). Latvia University of Agriculture, Jelgava, Drukatava LLC, p. 245.
29. Plesums, J., Osis, U., Runce, A., Ramane, I., Gaile, Z., Skuja, S. (2008). *Meat Cattle in Latvia* (in Latvian). p. 143.
30. Serviere J. (2014). Science and Animal Welfare in France and the European Union: Rules, Constraints, Achievements. *Meat Science*, Volume 98, Issue 3, pp. 484-489.
31. Zjalic, M., Dimitriadou, A., Rosati, A (s.a.). Beef Production in the European Union and the CAP Reform. An Overview of Situation and Trends. Retrieved: http://www.cattlenetwork.net/docs/eu/EU_Beef_sum_web.pdf Access: 29.12.2015

ENVIRONMENTAL CHANGES IN THE POLISH AGRICULTURE - TOWARD THE BIO-ECONOMY

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Abstract. This paper attempts to provide an interdisciplinary concept of the bio-economy in the context of environmental changes in the Polish agriculture. Various definitions of bio-economy have been presented and its place in the sustainable development theory have been described. The aim of this paper is to present the environmental changes in Polish agriculture in the context of the bio-economy. For this purpose uses the information published by the Central Statistical Office and Eurostat. To showcase and presentation methods were used descriptive and tabular. The empirical part presents changes of the essential elements characterising the agricultural sector, in particular, in terms of its impact on the natural environment. An attempt has been made to discuss the changes in the context of the implementation of the principles of sustainable development as well as development of bio-economy in the agricultural sector.

Keywords: bio-economy, sustainable development of agriculture, environment.

JEL code: Q56, Q57

Introduction

The assumptions of the concept of sustainable development have become nowadays essential to every area of the national economy. There is no question of taking any action related to the functioning of the state and development of any individual sector without taking into account these principles. But it is not easy to take measures, which would bring simultaneously the benefits in three different aspects considered in sustainable development, i.e. its economic, social and environmental aspect. Particular emphasis in the assumptions of sustainable development is put on activities in the agricultural sector, mainly because of its specific nature associated with production of food. Increasing¹ production of high-quality agricultural raw materials, while ensuring the economic viability of farms, preserving natural environment from the negative effects of farming and ensuring decent social conditions to the rural population, are big challenges. An agreement between the economic, social and environmental dimensions is possible through interdisciplinary concept of bio-economy,

which with its assumptions is in line with the theory of sustainable development.

The aim of this article is to present of environmental changes in Polish agriculture, through the analysis of the data contained in public databases like the Central Statistical Office and Eurostat. Discussion on the values discussed was directed towards a new and popular theory bioeconomy. An attempt was made to discuss the changes in Polish agriculture on the example of the specific data in the context of the theory of bio-economy. Research tasks in the article are to show changes in the main areas of agricultural activities which have the greatest impact on the environment. This is to show the changes taking place in agriculture in the context of environmental

Research materials and research method

The article presents the changes in Polish agriculture in terms of the impact on the environment. Considered the data presented in the context of a developing trend bio-economy. Different approaches to defining the problem being the subject of the paper based on literature on the subject have been discussed.

The empirical part focuses on various aspects of activity of the Polish agricultural sector in terms of impact on the natural environment.

¹ Increasing agricultural production on the global scale is inevitable due to the growing population, and, as a consequence, higher and higher demand for food.

Research objects were Polish farms characterized by national statistics. Farm is defined as a unit separate from the technical and economical, having a separate management (user or manager) and an agricultural activity (Charakterystyka gospodarstw...2014). The information related to changes in the structure of agricultural land in Poland, pollutants emitted into the atmosphere and use of mineral and lime fertilisers as well as plant protection products by agricultural sector has been used. The data published by the Central Statistical Office (GUS) and Eurostat have been used as the research materials. In the analysis, a descriptive method has been applied and the results have been shown in tabular and graphical form.

Bio-economy in agriculture

There are many definitions of the essence of bio-economy. It should be noted, however, that despite the differences in the approach to this issue, all the authors emphasise that the primary differentiator is the use of natural resources in the production process while preserving the original environment (Pajewski T., 2014). Indeed, this concept is in line with the assumptions of development of sustainable agriculture, which according to Krasowicz, are characterised by *"rational use of agricultural production environment and maintenance of production potential of soil, which ensures food self-sufficiency of the country and safe food. In addition, they are characterised by production of raw materials with desired quality parameters expected by the consumers and the industry, at the same time reducing or eliminating the threats to the environment. In the effect carrying out sustainable agricultural production would make it possible for agriculture to bring profitability comparable to other sectors of the economy and provide funds for modernisation and development"* (Krasowicz S., 2005).

Golebiewski describes bio-economy as set of sectors of the national economy, which deal with

the biological origin. In defining this term, he highlights the issue of sustainable use of resources. According to Golebiewski, the term *"bio-economy"* means sustainable production and conversion of biomass in relation to food, health, fibres, industrial products and energy, where the renewable resources of biomass include any biological resource, which can be used as a raw material. Bio-economy sector includes agriculture, forestry, food industry, fishing and fisheries, chemical, pharmaceutical, cosmetic and textile industries and energy production based on use of biomass as the main raw material (Golebiewski, 2013). The holistic nature of bio-economy in the context of the national economy is also described by Chylek. The author underlines that bio-economy covers virtually all sectors of the economy and the related services, which produce, process or make use of biological resources in any form. For the author, in addition to business and production aspects, also a theoretical aspect is important, because it makes it possible to define and implement innovative solutions. According to Chylek, bio-economy combines intensive research in many fields of science with innovative and comprehensive use of renewable raw materials, which come from the world of plants, animals and micro-organisms. In addition, bio-economy constitutes a strategic, trans-sectoral, integrating activity having an influence on economic development, which is in line with multidisciplinary approach to the rules of research funding (Chylek E. K., 2012).

A synthetic definition of bio-economy can be found in the report "The Knowledge Based Bio-Economy (KBBE) in Europe: Achievements and Challenges. Full report. 2010). The concept of bio-economy is described there as sustainable production and use of renewable biomass for food production, health, production of dietary fibre, industrial products and energy. Renewable biomass is defined here as any biological

resource that can be used as a raw material (The Knowledge...2010).

It can be noted that in the presented definitions the concept of bio-economy is based on the interdisciplinary approach of the representatives of the academic, business and administration environment² used in creating solutions, which, if developed, allow for the implementation of the objectives of sustainable development of the economy. A foundation of bio-economy is efficient use of natural resources to meet the needs of the population without affecting the environment. Therefore, we can see how important the agricultural sector and the conservation of resources should be in discussion of implementation of the bio-economy concept. Agriculture is a key sector of the economy due to the produced raw materials and the use of natural resources, thus, their more efficient use in terms of environment protection is currently the subject of lively debate both in the European Union and globally.

The specifics of the agricultural sector are emphasised by Walenia who highlights direct and strong ties of the agriculture with natural environment due to the use of living organisms of plants and animals in the production process and due to shaping the natural environment. He sees its uniqueness also in constant evolution consisting in systematic search of such a farming model, which fills its basic function, which is the production of agricultural products intended directly for consumption or for processing within the agri-food industry, and is well harmonised with the whole economy, at the same time following the principles of environmental protection, the principles of sustainable development. This phenomenon can also be seen in the emerging new functions of this sector. It is worth mentioning here production of biomass for production of renewable energy, protecting the environment and biodiversity as well as

² Cooperation in the area of science, business, administration is called the triple helix model

increasing landscape values (Walenia A., 2009).

New functions of the agriculture stem from many factors; nonetheless it seems that a primary one is growing awareness of the public as to the value of the natural environment and as to the related phenomena, which are characterised by the society-environment relationship.

Environmental protection depends to a large extent on the policy of the State. The policy specifies the framework, which agricultural producers should move within, when it comes to introducing agents mainly of chemical origin into the ecosystem. The importance of creating a policy promoting transition into low carbon economy is underlined by Bienkowski, Jankowiak, Holka. According to the authors, the most important role in the actions related to environmental protection both in Poland and globally is played by economic policies, which are intended for development of the low-carbon economy. Understanding the threats of degradation of ecosystems causes gradual changes in production systems, combining production, economic and social objectives. Currently, a primary research issue is to determine the future development of the society and economic conditions in order to reduce the pressure exerted on ecosystems by development of civilisation (Bienkowski J. F., Jankowiak J., Holka M., Dabrowicz R., 2014).

Environmental changes in the Polish agriculture

Agricultural production activities affect the natural environment. The classic division of agriculture into extensive and intensive suggests how the resources, particularly of natural origin (the environment), are used in production. However, analysing the impact of every activity on the environment is very difficult and perhaps even impossible, simply due to the fact that some effects of agricultural activity are hardly measurable or even completely immeasurable. Economic theory of externalities is applied here,

which depicts the relationships between the parties arising out of the unintended activities, which are not shown in market processes in terms of fees for these activities.

Changes in agriculture in relation to the natural environment can be seen from the perspective of the entire sector with the use of aggregated data. Table 1 shows changes in use of agricultural area in Poland in the years 2005, 2010 and 2014. It can be noted that during the considered period the total agricultural area decreased by about 2 %. In the years 2005-2014, within the agricultural land the areas used for development and ponds increased. A decrease of the utilised agricultural area is caused by many factors. Most often this is a result of conversion of agricultural land into residential area or other non-agricultural developments. Some agricultural areas are assigned for afforestation in relation to afforestation of agricultural land (RDP, Measure 5). The objectives of afforestation of agricultural land under Measure 5 of the RDP are:

- 1) extending forested areas in line with the National Woodland Extension Programme;
- 2) afforestation of agricultural land with low usefulness for agriculture and susceptible to degradation (erosion, soil fatigue, penetration of pollutants into groundwater);
- 3) strengthening the ecological functions of afforested areas by restoring the old and creating new connections between existing forests to maintain the migratory routes of animals and ecological corridors;
- 4) increasing the share of forests in the global carbon balance, by increasing the absorption of CO₂ by tree vegetation in Poland. Afforestation helps mitigate the "greenhouse effect" responsible for global warming on

Earth (11. Zalesianie gruntów rolnych. Przewodnik. MRiRW, p. 6).

Natural environment is also affected by activities associated with the use of mineral fertilisers. Table 2 provides the information on consumption of mineral and lime fertilisers in the agricultural sector. It may be noted that in the analysed period there was a slight increase (about 3 %) in use of NPK fertilisers per 1 ha of agricultural land. In contrast, consumption of lime fertilisers fell by more than a half. Costs associated with the NPK fertilisation were the main cause of moderate changes in use of these fertilisers. A pragmatic approach of farmers to their business is demonstrated here, which is associated with the exact calculation of the costs of their activity.

Sales, or in fact consumption of plant protection products used by farmers also affects the natural environment, particularly the water reservoirs located near the land, where the chemicals are used. A noticeable increase in use of four out of the five presented groups of PPP (Figure 1) is associated with more and more popular ploughless tillage. Cultivating machines replacing the tillage significantly reduce production costs but contribute to the development of weeds, fungi and pests devastating crops.

Emission of various pollutants into the atmosphere is a relevant issue in the face of changing global climate. Emissions from agriculture are mainly associated with the production of methane as a result of enteric fermentation and formation of animal manure. On a global scale, agriculture is a sector emitting significant amounts of greenhouse gases into the atmosphere.

Table 1.

Changes in use of agricultural area in Poland

Item	2005	2010	2014	Changes from 2014 to 2005, %
	in thousand ha	in thousand ha	in thousand ha	
Arable land	14074	13969	13818	98
Orchards	296	292	285	96
Permanent meadows	2353	2293	2260	96
Permanent pastures	1695	1638	1613	95
Built-up agricultural land	527	530	529	100*
Land for ponds	51	70	79	155
Land for ditches	152	138	132	87
Total agricultural land	19148	18930	18716	98

* Non-visible percentage change is a result of rounding method

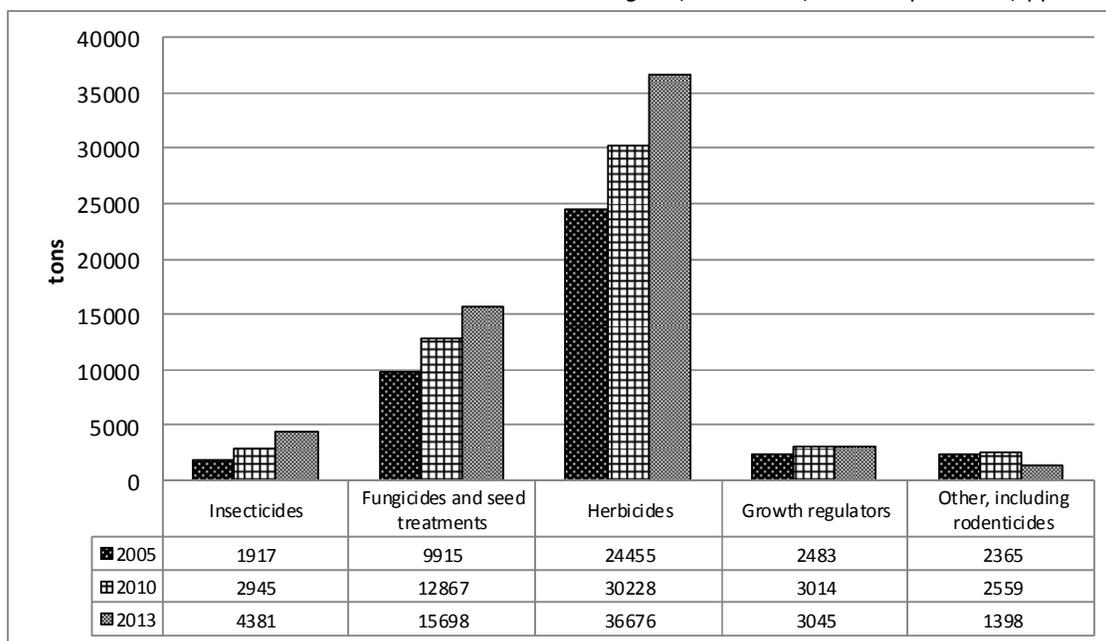
Source: author's calculations based on data provided by the Central Statistical Office (GUS), "Ochrona srodowiska 2014"

Table 2.

Consumption of mineral and lime fertilisers in Poland

Item	Consumption of mineral and lime fertilisers in pure component in the years			
	2004/ 2005	2010/ 2011	2012/ 2013	Change from 2004/2005 to 2010/2013, %
Total amount of NPK fertilisers in thousand tonnes	1628.4	1954.4	1943.4	119
NPK mineral fertilisers per 1 ha of agricultural land in kg	129.1	129.1	133.0	103
Total amount of lime fertilisers in thousand tonnes	1455.6	568.3	634.7	44
Lime fertilisers per 1 ha of agricultural land in kg	91.5	37.6	43.4	47

Source: author's calculations based on data provided by the Central Statistical Office (GUS), "Ochrona srodowiska 2014"



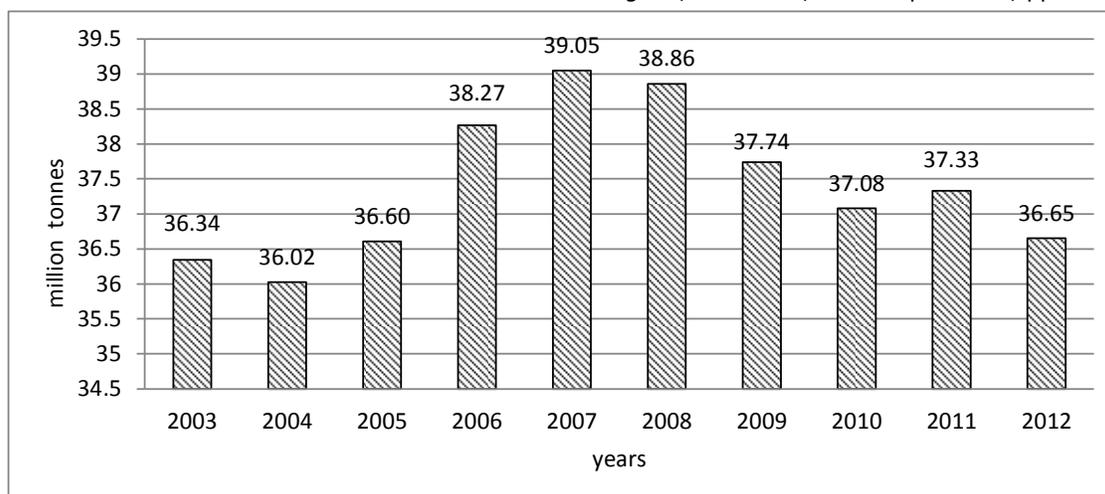
Source: author's calculations based on data provided by Central Statistical Office (GUS), "Ochrona środowiska 2014"

Fig. 1. Sales of plant protection products (PPP) in Poland (all products admitted to trading)

As indicated by Steinfeld, "direct greenhouse gas emissions (GHG) associated with agricultural production account for about one-seventh of global emissions of this gas into the atmosphere. However, in connection with the emission resulting from the destruction of forest resources for further expansion of agricultural areas and the emissions from processes of production, packaging, distribution, transportation, disposal and other activities associated with food production and consumption, overall greenhouse gas emissions associated with agriculture and

consumption of food may exceed even 40 % of total global emissions" (Steinfeld H., 2006).

Greenhouse gas emissions from the Polish agriculture are shown in Figure 2. The emissions increased in the years 2004-2007 and over the subsequent years the discussed values decreased. This was a result of such factors as: the green policy of the European Union, introducing the principles of sustainable agriculture in the Polish rural areas and increasing farmers' awareness of the environmental protection issues.



Source: author's calculations based on Eurostat: <http://appsso.eurostat.ec.europa.eu/nui/show.do>

Fig. 2. Greenhouse gas emissions from Polish agriculture (CO₂ equivalent)

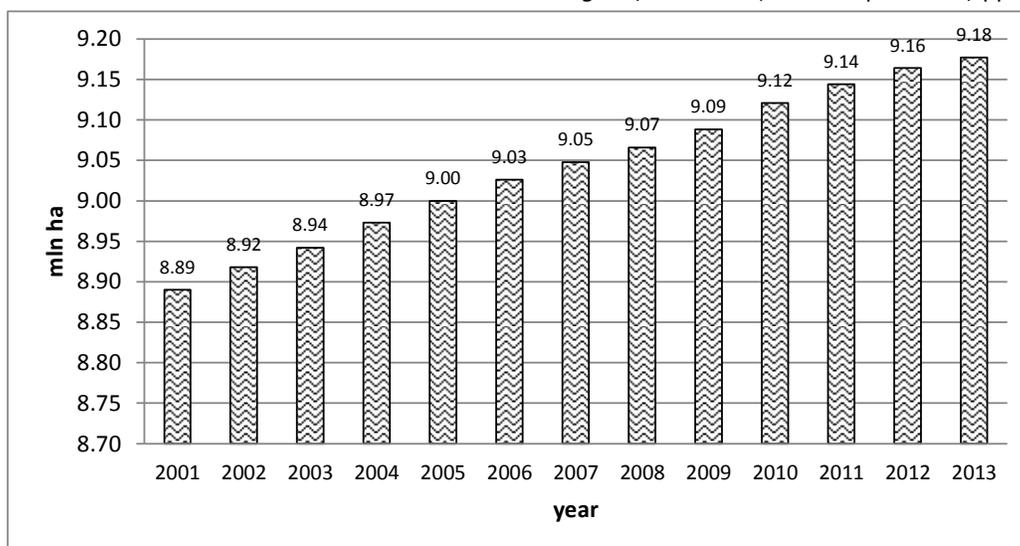
Economic development based on the assumptions of sustainable development and the theory of bio-economy is mainly based on employing a natural resources in an environmentally friendly manner. One of the elements characterizing the economy, whose development is based on these principles is the process of afforestation.

In Poland, increasing the area of forests is carried out mainly on the basis of the "National Programme of increasing forest cover" and the activities of the Agency for Restructuring and Modernisation of Agriculture (ARMA) in the framework of the program "Afforestation of agricultural and non-agricultural land" (www.arimr.gov.pl) which is part of the Rural Development Programme. Figure 3 shows the change of forested Polish territory in the period 2001-2013.

Figure 3 is visible larger area of forest in Poland in the years 2001-2013. The end of 2013. Polish territory occupied 9.18 million hectares of forests which corresponds to the forest cover at

around 29.5 %. The per capita for about 0.24 ha of forest (Ministry for environment. Information2015).

To increase forest cover in Poland is influenced by many factors. There are activities here, such as the implementation of a national program to increase forest cover, ARMA activities related to the funding of afforestation of agricultural land - which encourages farmers to transform their land to the forest. From the point of view of bio-economy increase in forest area is a desirable phenomenon. Convinces about Golebiewski representing sectors of forestry, agriculture, fishing and hunting as those that produce raw materials essential for the development of the bio-economy (Golebiewski., 2013).



Source: Ministry for environment. Informacja o stanie lasów oraz o realizacji „Krajowego programu zwiększania lesistości” w 2013 r. Warszawa. 2015. p. 14

Fig. 3. Change of forest area in Poland in the years 2001-2013

Conclusions, proposals, recommendations

The concept of bio-economy covers almost all sectors of the economy. Its uniqueness is a result of an interdisciplinary approach for solving economic, social and environmental problems. The emphasis it puts on the smart use of environmental resources can be a basis for new innovative solutions, which in a long term will bring positive social, environmental and economic effects. Therefore, it is important that environmental policy adopted by the individual countries is aimed at pro-environment activities.

Changes in the Polish agriculture should also move towards protection of natural resources without ignoring challenge of ensuring adequate quality and quantity of food raw materials. Since 2005 in Poland the area of land used for agriculture has been reduced (by about 2 %) mainly due to non-agricultural (residential or industrial) construction projects. An important factor has also covered conversions of agricultural areas into forests under RDP. From the perspective of bio-economy a much better solution for use of agricultural land is afforestation, because it brings specific environmental benefits to the society.

A small change (an increase of about 3 %) in use of mineral fertilisers also helps in achieving the assumption of both sustainable agriculture and bio-economy due to the conscious use of fertilisers of chemical origin. However, the information on the use of PPP, where a high increase has been noted, give cause for concern. Positive changes in relation to natural environment include reduction of greenhouse gases emitted into the atmosphere by the agriculture sector since 2007.

The objectives of sustainable agriculture and bio-economy, which are characterised by a pro-environment approach, are not easy to achieve. Because there will always be a conflict between the economic efficiency of agricultural activity, which implies exerting pressure on the environment, and the protection of the environmental values.

Presented in text the study do not reflect the characteristics of the sector as a whole bio-economy also defined as: " the knowledge-based production and utilization of biological resources to provide products, processes and services in all sectors of trade and industry within the framework of a sustainable economic system"(German Bioeconomy...2015). The study

does not reflect the definition of bio-economy comprised many aspects, but pay attention to some environmental trends in one of the main sectors of the bio-economy - agriculture, which significantly affects the development of this new discipline. Satisfactory from the point of view of

trends can be associated with reducing the negative environmental effects of agricultural activities especially in terms of GHG emissions, the insertion into the soil fertilizers or afforestation of land, including agricultural land.

Bibliography

1. Bieńkowski, J.F., Jankowiak, J., Holka, M., Dąbrowicz R., (2014). Środowiskowa ocena rolnictwa w ujęciu regionalnym. RN SERiA. Volume XVI. Issue 1. p.14.
2. Charakterystyka gospodarstw rolnych w 2013 roku. GUS. Warszawa 2014. P.18.
3. Chylek, E.K. (2012). Biogospodarka w sektorze rolno-spożywczym. Przemysł Spożywczy Volume.66. p.32.
4. Eurostat: <http://appsso.eurostat.ec.europa.eu/nui/show.do>. Retrieved: 20.11.2015
5. German Bioeconomy Council. (2015). What is Bioeconomy? Source: <http://bioekonomierat.de/en/bioeconomy/> Access: 01.03.2016
6. Golebiewski, J. (2013). Zrównowazona biogospodarka – potencjał i czynniki rozwoju. IX Kongres Ekonomistów Polskich. p. 10.
7. Krasowicz, S. (2005). Cechy rolnictwa zrównowozonego, Koncepcja badań nad rolnictwem społecznie zrównowozonym. IERiGŻ. p. 25.
8. Ochrona środowiska 2014. GUS
9. Pajewski, T. (2014). Biogospodarka jako strategiczny element zrównowozonego rolnictwa. ZN SERiA. Volume XVI. Issue 5. p.183.
10. Steinfeld, H. a. al. (2006). Livestock's Long Shadow: Environmental issues and options. Food and Agriculture Organization of the United Nations. Rome. Retrieved: <http://www.fao.org/3/a-a0701e.pdf>. Access: 25.11.2015
11. Szczegółowa instrukcja wypełniania wniosku o przyznanie płatności w ramach systemów wsparcia bezpośredniego, płatności dla obszarów z ograniczeniami naturalnymi lub innymi szczególnymi ograniczeniami (ONW), płatności rolno-środowiskowo-klimatycznej (PROW 2014-2020), płatności ekologicznej (prow 2014-2020), płatności rolnośrodowiskowej (PROW 2007-2013), o wypłatę pomocy na zalesianie (PROW 2007-2013) na rok 2015. (2015) <http://www.arimr.gov.pl/dla-beneficjenta/wnioski/2015-zalesianie-gruntow-rolnych-oraz-gruntow-innych-niz-rolne-prow-2007-2013.html>. Access: 01.03.2016
12. The Knowledge Based Bio-Economy (KBBE) in Europe: Achievements and Challenges. Full report. 2010. p.13.
13. Walenia, A. (2009). Wybrane zagadnienia rozwoju rolnictwa na obszarach Polski Wschodniej. PRS. Volume9. Issue (24). pp. 176-177.
14. Zalesianie gruntów rolnych. Przewodnik. MRiRW. p. 6. Retrieved: file:///C:/Users/Tomek%20P/Downloads/zalesianie_27-02.pdf Access: 01.12.2015

ANALYSIS OF THE FACTORS AFFECTING COST EFFICIENCY IN THE DAIRY INDUSTRY IN LATVIA

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Abstract. The dairy industry is one of the most important industrial sectors for healthy development of Europe. There is not a single country being part of the EU that does not produce milk. In Latvia, the dairy industry is of great importance, as it ranked second behind grain in the percentage distribution of agricultural final products. Regardless of changes in the dairy industry since 2000, it is fragmented in Latvia. The year 2014 was quite difficult for the dairy industry in Latvia due to the embargo on dairy products imposed by Russia, low milk purchase prices and concerns regarding exceeding the milk quota. For these reasons, an urgent problem is efficiency increase possibilities in the dairy industry in order not to let it stagnate and dairy farms go bankrupt. The research aim is to analyse the dairy industry and the factors affecting farm cost efficiency in Latvia. To achieve the aim, the "cost parameter equation method" was employed to identify milk production efficiency for 113 farms based on the key cost items: labour, land, capital and intermediate consumption. The research found that milk production costs on farms in Latvia significantly differed. The reason was different labour consumption and different capital costs if measured per tonne of milk produced and sold. The farms were not interested in doing business efficiently from the perspective of land use, as direct area payments of the EU provided additional revenue.

Key words: milk production, costs, labour, efficiency

JEL code: Q10, Q12

Introduction

Compared with other sectors of the economy, agriculture is known for its specific features. First of all, production processes in agriculture are complemented by a factor of influence of natural conditions, weather, the length of production processes and the associated length of current assets turnover (Lososova J., Zdenek R., 2014).

The dairy industry is one of the most important industrial sectors for healthy development of Europe. There are many reasons why the dairy sector is so important for the European Union (EU). There is not even one country that is part of the EU that does not produce milk (Prisenk J. et al., 2015). But the quota system has been limiting the EU milk production. Between 2004 and 2013, the EU milk production barely changed from 148.7 to 152.4 Mt (+2.5 %). During the same period, milk production in the United States increased from 77.5 to 91.3 Mt (+17.7 %), and the production in New Zealand rose from 15 to 18.9 Mt (+25.6 %) (Sobczynski T. et al., 2015). Nowadays, dairy farmers are facing new challenges and opportunities arising from the EU

Common Agricultural Policy (CAP) reform for the removal of milk quotas by 2015. This will allow expansion unlimited by quota for the first time since milk quotas were introduced in 1984 (Kelly E. et al., 2012). And it means that competition in milk production will increase and farms have to consider the ways how to achieve better performance results through raising their milk production efficiency. Several factors of productivity management that could affect company's profitability are considered: labour cost efficiency, labour cost competitiveness, capital intensity and capital productivity (Muminovic S., Aljinovic Barac Z., 2015).

According to S. Muminovic & Z. Aljinovic Barac (2015), productivity management components, labour cost competitiveness and capital productivity have positive impacts on a company's profitability. But "*higher milk productivity does not necessarily improve profitability*" (Machado Filho L. P. et al., 2014). Maximising production levels and profit are goals cherished by most smallholder dairy farms. It is thus important to understand the levels of performance that farmers achieve in the current

milk production systems, and what the viability of milk production and the farming system is in general (Somda J. et al., 2005). But no two farms are the same and CAP reforms will affect all producers differently. Everyone should look at where their business is now and where they want it to be in future before making decisions. ...there were four strategies for milk producers to examine. They could increase business turnover, they could improve efficiency, they could find alternative income sources or in some cases they may want to cease milk production (Long J., Buss J., 2004). There has to be also taken into consideration that the *"importance of dairy sector for local communities reflects in the creation of employment opportunities, primarily low-skilled workers, women and the young. This contributes to rural development and poverty reduction in national economies"* (Jandric M. et al., 2015).

In Latvia, the dairy industry is of great importance, as it ranked second with 24.1 % in the percentage distribution of agricultural final products behind grain (27.6 %) in 2014, and it was the greatest increase in value compared with 2009 (+82 %). However, the year 2014 was quite difficult for the dairy industry in Latvia due to the embargo on dairy products imposed by Russia, low milk purchase prices and concerns regarding exceeding the milk quota (Ministry of Agriculture, 2015). Therefore, an urgent problem is efficiency increase possibilities in the dairy industry in order not to let it stagnate and dairy farms go bankrupt, as *"dairy farming in Latvia is still fragmented and totally 1944 farms stopped their dairy business in 2014"* (Ministry of Agriculture, 2015).

Accordingly, the **research object** is milk production in Latvia, while the **research subject** is farm cost indicators in milk production.

The research **aim** is to analyse the dairy industry and the factors affecting farm cost efficiency in Latvia. To achieve the aim, the following specific tasks were set: 1) to describe

2) to analyse the key factors affecting farm costs in milk production.

Research methods applied

The study analysed information and data from the Central Statistical Bureau (CSB) of Latvia and data of the Farm Accountancy Data Network (FADN) of Latvia. The EU FADN is an instrument for evaluating the income of agricultural holdings and the impacts of the CAP (European Commission, 2015). Analysis, synthesis and the logical construction method were employed to execute the research tasks. In addition, the *"cost parameter equation method"* (CPE) was employed because an account of accounting costs did not allow objectively identifying the most efficient farms, as unpaid labour costs as well as potential revenues from an alternative use of land were not included in calculations. CPE is based on cost price calculation, by inclusion and unification of labour price, as well as land price. It is done because not all farmers do include in production costs their own (and family) labour input and very often land price is not included, supposing land is for free. So, according to the CPE method, calculations include unpaid labour costs and making the labour costs equal across farms. Besides, it is assumed that land has an opportunity cost – the owner of land could rent it out. Accordingly, the use of land for the production of products involves costs in the form of forgone rents. Calculations of efficiency in milk production have to include the key cost items, measured per tonne of milk sold. In identifying efficiency, the key cost items represent the key factors of production: labour, land, capital as well as intermediate consumption¹.

$$TCt = LCt + ZIt + CCt + ICt \quad [1]$$

where:

TCt – total cost per tonne of sold milk for a farm;

¹ Intermediate consumption is the value of goods and services used in production (Krievina, 2012).

LCT – labour cost per tonne of sold milk for the farm;

ZIt – land opportunity cost per tonne of sold milk for the farm;

CCT – capital cost per tonne of sold milk for the farm;

ICt – intermediate consumption cost per tonne of sold milk for the farm (LLU, 2015).

The way all the factors of production are combined is determined by the knowledge of every producer. The present research analysed and summarised information on the distribution of various production costs in milk production in Latvia. The calculations were based on the 2013 data for 113 FADN dairy farms of various sizes, whose revenue from milk production accounted for more than 2/3 of their total revenue. A number of assumption were made for the calculations: 1) all the farms should pay equal wages per hour regardless of whether their employees are regarded as paid or unpaid labour (EUR 4.3 an hour); 2) every hectare of meadows and pastures as well as of grasses sown in arable land may be rented out by the owner. Consequently, if farmers farm their land and produce milk, there are foregone revenues (EUR 71.1 per hectare).

Novelty and topicality of the research

The present research points to necessity to produce milk in Latvia as efficiently as possible and, in order to compare the factors affecting the

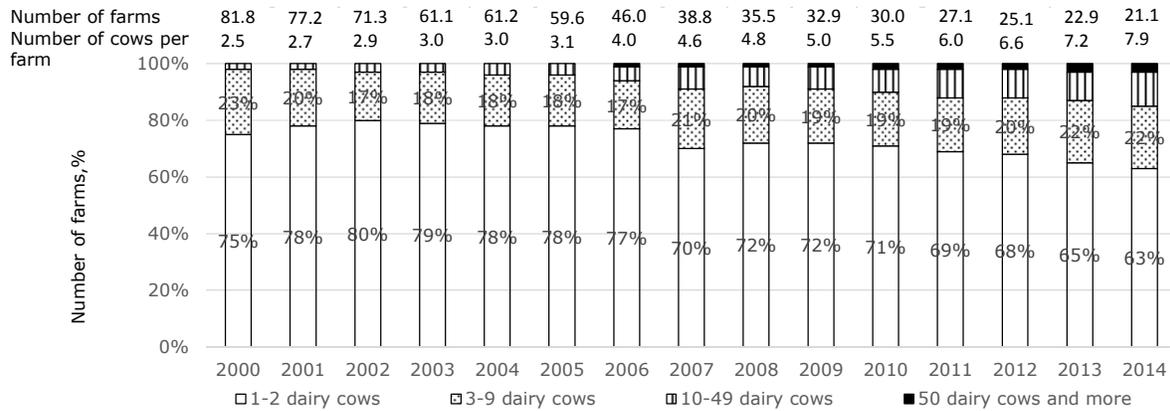
financial performance of various dairy farms, the CPE method was employed to compute not only total cost, capital and intermediate consumption costs but also labour costs, including unpaid labour and land opportunity costs.

Research results and discussion

1. Characteristics of the dairy industry in Latvia

The output of milk in Latvia rose to more than 900 000 tonnes in 2013 for the first time since 2000; it also continued to increase in 2014, reaching 972 000 tonnes, which was 16 % more than in 2007. A stable increase in milk output in Latvia has been reported since 2004, which was interrupted by a crisis in the milk market for three years, the beginning of which was observed already in 2008 (CSB, 2015a).

The average milk yield per cow increased in Latvia from year to year – it was 4 tonnes in 2000, while in 2014 it reached 5.8 tonnes (+45 %) (CSB, 2015b). Given the fact that cow productivity in other North European countries is higher and could reached, for example, on average, 8.7 tonnes in Finland in 2011 (European Commission, 2014), one can predict that the average milk yield in Latvia will continue increasing. At the same time, it has to be noted that according to the SJSC Agricultural Data Centre (ADC), some farms in Latvia have already reached high milk yields.



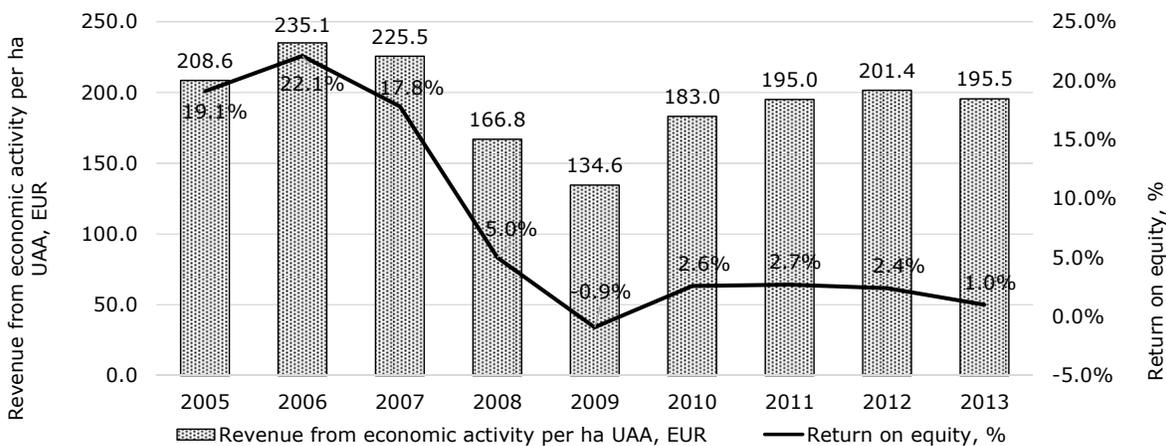
Source: authors' calculations based on CSB, 2015a, 2015b, ADC, 2015

Fig. 1. Characteristics and percentage distribution of dairy farms in Latvia in the period 2000-2014

Structural changes continue taking place in milk production in Latvia – mainly small farms (with a herd of less than 9 dairy cows) stop their business, whereas medium and large farms (with more than 10 cows) increase their milk output. In Latvia, small dairy livestock farms are still prevailing, as the average herd was 7.9 dairy cows in 2014, which was 3.2 times more than in 2000 (Figure 1).

The quantity of milk sold for processing persistently increases in Latvia – it reached 804 400 tonnes in 2014 (+28 % compared with

2007). With farms becoming more market-oriented, the proportion of milk sold on the market in the total quantity of milk produced reached 83 % in 2014 (CSB, 2015c). In the EU-15, on average, approximately 96 % of the total milk produced is sold on the market (Krievina A., 2012). Until 1 April 2015, the quantity of milk for sale was limited in Latvia by its milk quota. Preparing for the opening of the milk market, the milk quota was almost fully fulfilled (99.14 %) in 2014/2015 (Ministry of Agriculture, 2015).



Source: authors' calculations based on LVAEI, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013 and 2014

Fig. 2. Financial indicators of dairy farms in Latvia in the period 2005-2013

Revenues of dairy farms from their economic activity, which is characterised by the difference between revenues from products produced (production subsidies included) and production costs per unit of agricultural area, have slightly

declined (Figure 2). In particular, the return on equity ratio (revenues have to include investment subsidies attributable to the reporting year, while expenses have to include unpaid labour cost) has worsened. The revenue indicators for dairy farms

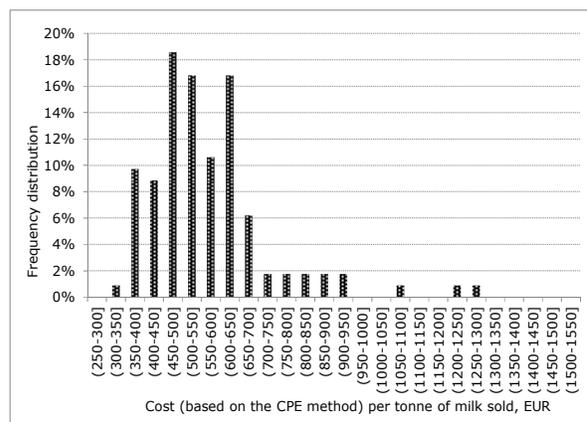
of various sizes differ. As regards the return on equity ratio, negative values were observed for small and medium farms (with a SO¹ less than EUR 25 000), while the best performance results were achieved by medium large and large farms (with a SO less than EUR 500 000).

Milk purchase prices have been mostly rising in Latvia since 2000, except for 2009 when the prices fell to a very low level owing to the milk market crisis. The year 2013 was very favourable for milk producers in Latvia, as the average milk purchase price was EUR 30.5 per 100 kg, which was the highest price level ever reached in this industry. However, with dairy products being included in the list of products subject to the embargo on exports to Russia, the milk purchase prices fell by almost a third, on average, in 2014, comparing the prices in the beginning of 2014 with those in the beginning of 2015. It has to be mentioned that among the three Baltic States, the sharpest milk purchase price decrease in 2014 was reported in Lithuania. In Latvia, the average milk purchase price was still below that in Estonia (by 13 %), and in 2014 it was below the average EU-15 level by about 30 % (CSB, 2015d). In Latvia, the prices of resources exploited in agricultural production tended to increase (there was a decrease during the milk market crisis), including a hike price on feed. The increase in prices on production resources considerably decreased the positive effect of high milk purchase prices; in 2014 as well the decrease in prices on goods and serviced used in production was relatively smaller than the average milk price fall. Therefore, farms have to analyse the situation in the dairy industry and seek possibilities for efficient farming through trying to reduce costs in order to offset milk purchase price decreases.

¹ SO – standard output

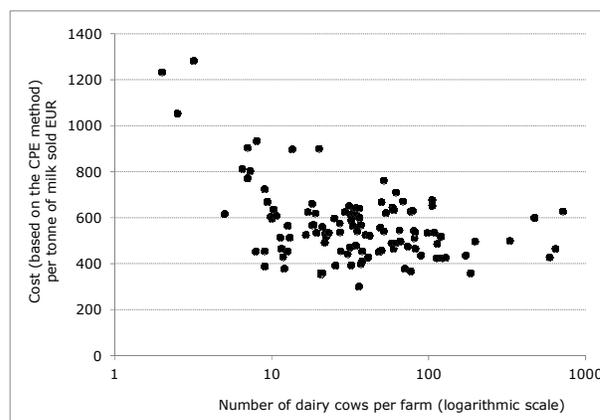
2. Analysis of the factors affecting the financial performance of dairy farms

An analysis of the financial performance of FADN farms shows that the range of milk production costs for farms in Latvia, based on the CPE method is very broad (Figure 3), as the average cost per tonne of milk sold reaches EUR 400-600, and it may vary from EUR 300 to 1300, i.e. more than fourfold. It means that if farms fully covered labour and land rent costs, they would suffer losses, as their total cost per tonne of milk sold exceeds the milk purchase price. So presently farmers do not value their own work in terms of money, and also their land is owned, which involves no rent costs.



Source: authors' calculations based on LVAEI, 2014

Fig. 3. Distribution of total milk production costs per tonne of sold milk in Latvia in 2013, EUR

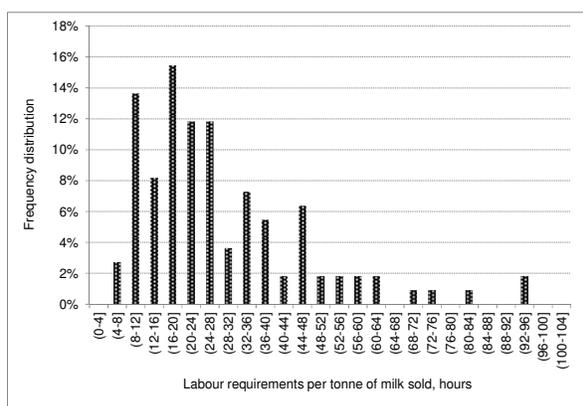


Source: authors' calculations based on LVAEI, 2014

Fig. 4. Total costs depending on the number of cows per farm in Latvia in 2013

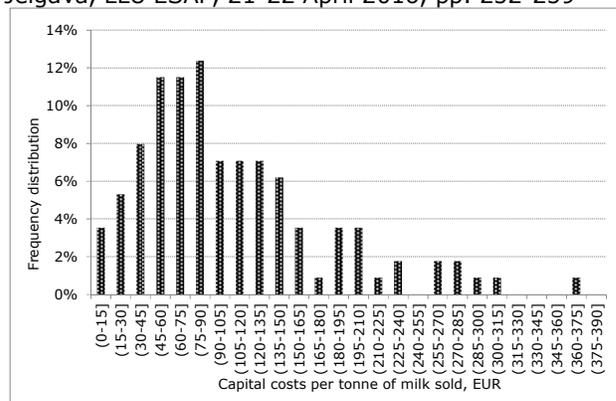
Besides, there is no strong correlation between the size of a farm and its cost per tonne of milk sold (Figure 4). An exception is very small farms and a small group of farms with 5-20 dairy cows whose production costs are much above the average. At the same time, there is a range of farms with 10-20 dairy cows, which, in terms of costs, are more efficient than some large farms. Further, the research presents the distribution of costs for the factors of production analysed and for intermediate consumption.

Distribution of unit labour requirements and capital costs. Unit labour requirements, measured per tonne of milk sold, considerably differ across the farms. More than 16% of the farms use less than 12 labour hours per tonne of milk sold. Approximately the same number of farms consumes more than 44 labour hours to produce a tonne of milk (Figure 5). Most of the farms (more than 60%) use 8-28 labour hours to produce a tonne of milk, which indicates possibilities for the farms to further increase their efficiency.



Source: authors' calculations based on LVAEI, 2014

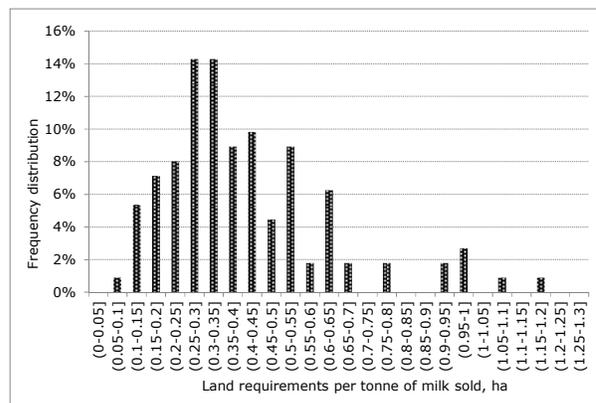
Fig. 5. Distribution of labour requirements per tonne of sold milk in Latvia in 2013, hours



Source: authors' calculations based on LVAEI, 2014

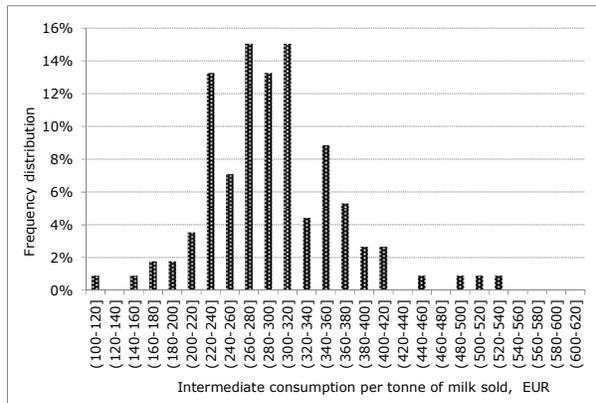
Fig. 6. Distribution of capital costs per tonne of sold milk in Latvia in 2013, EUR

Capital costs measured per tonne of milk sold are very diverse across the dairy farms; yet, the costs range within EUR 45-90 per tonne of milk sold for the majority of them (Figure 6). It has to be noted that no association was identified between the highest capital cost and the lowest unit labour requirement – namely, larger investments did not result in a more efficient use of labour. The farms with the greatest capital costs per tonne of milk sold did not represent mostly medium and large farms that made relatively large investments in their modernisation.



Source: authors' calculations based on LVAEI, 2014.

Fig. 7. Distribution of land requirements per tonne of sold milk in Latvia in 2013, ha



Source: authors' calculations based on LVAEI, 2014.

Fig. 8. Distribution of intermediate consumption costs per tonne of sold milk in Latvia in 2013, EUR

Distribution of unit land requirements and intermediate consumption costs. An analysis of the distribution of frequency of occurrence for land requirements leads to a conclusion that the farms most often needed land within a range of 0.25-0.35 ha in size to produce a tonne of milk, while almost a third exploited more than 0.4 ha for the production of a tonne of milk (Fig. 7).

The distribution of intermediate consumption costs (Fig. 8) takes a form that is close to a standard normal distribution with a maximum within EUR 260-320 per tonne of milk sold. Of the farms, 28 % spent less than EUR 260 on intermediate consumption per tonne of milk sold.

Conclusions, proposals, recommendations

The dairy industry in Latvia is the second most important agricultural industry behind grain production if measuring its proportion in the percentage distribution of final agricultural products. The lifting of milk quotas in the EU in 2015 and Russia's embargo on dairy products in 2014 resulted in a decrease in milk prices in Latvia by almost a third, which makes producers

Bibliography

1. Agricultural Data Centre (ADC) (2015). Dairy Statistics (in Latvian). Retrieved: <http://www ldc.gov.lv/lv/statistika/parraudziba/>. Access: 17.12.2015
2. Central Statistical Bureau (CSB) (2015a). LLG008. Output of Principal Livestock Products. Retrieved: <http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-dzivnieku-skaitis-un-lopkopibas-razosana-38208.html> TARGET=_blank>Metadati. Access: 18.12.2015

By employing the "cost parameter equation method", it is possible to compare the production costs of milk produced on various farms, which significantly differed (more than fourfold) for the analysed 113 farms. The overall cost analysis reveals that farms in Latvia so far operate without paying full wages to their labour (their own contribution to their farm is not valued in terms of money), exploiting their owned land on which no rent has to be paid.

In Latvia, milk production costs significantly varied owing to the difference in labour consumption, as more than 60 % of the farms used 8-28 labour hours to produce a tonne of milk. Capital costs measured per tonne of milk sold were diverse across the dairy farms; yet, the costs ranged within EUR 45-90 per tonne of sold milk for the majority of them. The farms were not interested in efficient farming from the perspective of land use, as direct area payments of the EU provided additional revenue, and thus, more than a third of farms in Latvia exploited more than 0.4 ha of land to produce a tonne of milk. The distribution of intermediate consumption costs takes a form that is close to a standard normal distribution with a maximum within EUR 260-320 per tonne of milk sold.

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3. Central Statistical Bureau (CSB) (2015b). LLG012. Livestock Productivity. Retrieved: <http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-dzivnieku-produktivitate-38946.html> TARGET=_blank>Metadati. Access: 18.12.2015
4. Central Statistical Bureau (CSB) (2015c). LIG0115. Purchase of Milk and Milk Quality. Retrieved: <http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-produktu-iepirkuma-cenas-un-indeksi-38163.html> TARGET=_blank>Metadati. Access: 18.12.2015
5. Central Statistical Bureau (CSB) (2015d). LIG0112. Purchase Prices of Agricultural Products (euro per t). Retrieved: <http://www.csb.gov.lv/statistikas-temas/metodologija/lauksaimniecibas-produktu-iepirkuma-cenas-un-indeksi-38163.html> TARGET=_blank>Metadati. Access: 18.12.2015
6. European Commission (2014). EU Dairy Farms Report 2013 based on FADN data. p. 62.
7. European Commission (2015). The Farm Accountancy Data Network public database. Retrieved: http://ec.europa.eu/agriculture/rica/database/database_en.cfm Access: 29.11.2015
8. Jandric, M., Vasiljevic, Z., Kovacevic, V. (2015). Financing the Dairy Sector in Rural Areas of the Republic of Serbia: Pester region Example. *Agriculture & Forestry / Poljoprivreda I Sumarstvo*, 61(1), pp. 273-278.
9. Kelly, E., Shalloo, L., Geary, U., Kinsella, A., Wallace, M. (2012). Application of Data Envelopment Analysis to Measure Technical Efficiency on a Sample of Irish Dairy Farms. *Irish Journal of Agricultural & Food Research*, 51(1), pp. 63-77.
10. Krievina, A. (2012). Value Added Creation Problems and its Increase Possibilities in Dairy Sector. Summary of doctoral dissertation, Jelgava, p. 131.
11. Latvia University of Agriculture (LLU) (2015). Report of the Subproject "Development of Efficient Farming Models" (In Latvian), Jelgava, p. 117.
12. Latvian State Institute of Agrarian Economics (LVAEI) (2006). Agricultural Holdings. Results of Economic Analysis 2005 (FADN) (in Latvian), Riga, pp.144-209.
13. Latvian State Institute of Agrarian Economics (LVAEI) (2007). Agricultural Holdings. Results of Economic Analysis 2006 (FADN) (in Latvian), Riga, pp. 136-201.
14. Latvian State Institute of Agrarian Economics (LVAEI) (2008). Agricultural Holdings. Results of Economic Analysis 2007 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
15. Latvian State Institute of Agrarian Economics (LVAEI) (2009). Agricultural Holdings. Results of Economic Analysis 2008 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
16. Latvian State Institute of Agrarian Economics (LVAEI) (2010). Agricultural Holdings. Results of Economic Analysis 2009 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
17. Latvian State Institute of Agrarian Economics (LVAEI) (2011). Agricultural Holdings. Results of Economic Analysis 2010 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
18. Latvian State Institute of Agrarian Economics (LVAEI) (2012). Agricultural Holdings. Results of Economic Analysis 2011 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
19. Latvian State Institute of Agrarian Economics (LVAEI) (2013). Agricultural Holdings. Results of Economic Analysis 2012 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
20. Latvian State Institute of Agrarian Economics (LVAEI) (2014). Agricultural Holdings. Results of Economic Analysis 2013 (FADN) (in Latvian), Riga, Retrieved: <https://sudat.lvaei.lv/Login.aspx?ReturnUrl=%2fDefault.aspx>. Access: 14.12.2015
21. Long, J., Buss, J. (2004). CAP Reform Will Bring Hard Times to Dairying. *Farmers Weekly*, 140(15), p. 34.
22. Lososova, J., Zdenek, R. (2014). Key Factors Affecting the Profitability of Farms in the Czech Republic. *Agris On-Line Papers in Economics & Informatics*, 6(1), pp. 21-36.
23. Machado Filho, L. P., D'Avila, L. M., da Silva Kazama, D. C., Bento, L. L., & Kuhnen, S. (2014). Productive and Economic Responses in Grazing Dairy Cows to Grain Supplementation on Family Farms in the South of Brazil. *Animals* (2076-2615), 4(3), pp. 463-475.
24. Ministry of Agriculture (2015). Agriculture of Latvia 2015. Riga, p. 156.
25. Muminovic, S., Aljinovic Barac, Z. (2015). Does Productivity Affect Profitability in Dairy Processing Industry? Evidence from Slovenia, Croatia and Serbia. *Mljekarstvo / Dairy*, 65(4), pp. 269-279.
26. Prisenk, J., Sabljic, D., Zratic, M., Turk, J. (2015). Econometric Modelling Approaches in Studies of the EU Dairy Sector. *Indian Journal of Animal Research*, 49(5), pp.717-724.
27. Sobczynski, T., Klepacka, A. M., Revoredo-Giha, C., Florkowski, W. J. (2015). Dairy Farm Cost Efficiency in Leading Milk-Producing Regions in Poland. *Journal of Dairy Science*, 98(12), pp. 8294-8307.
28. Somda, J., Kamuanga M., Tollens E. (2005). Characteristics and Economic Viability of Milk Production in the Smallholder Farming Systems in the Gambia. *Agricultural Systems*, Volume 85, Issue 1, July 2005, pp. 42-58.

DEVELOPMENT OF SUSTAINABLE LIVING ENVIRONMENT IN THE CITIES THROUGH THE BIOECONOMY

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Abstract. Around three quarter or 72.4 % of the European Union's population live in urban areas, and this share continues to grow; thus, towns and cities are the centres of economic activity and social life. At the same time, the constant increase of population, a lack of strategic planning and poor environment management cause a lot of problems for the living environment and life quality. Such situation analysis initiated this study which is of theoretical nature and aims to provide the knowledge base for development of sustainable living environment in the cities through the bioeconomy. The aim of the study was to explore the living environment from the sustainability perspective and to describe the key areas of life where bioeconomy can facilitate development of sustainable living environment in the cities. In this research, suitable qualitative and quantitative research methods were applied. The research finds out that most of the European cities have common environmental problems, with most worrying issues being air pollution and water pollution. Therefore, providing qualitative and sustainable living environment in urban areas has become an important issue. In this study, the authors have explained concept of sustainable living environment, which focuses on the following: good state of environment, biodiversity and well functioning ecosystem services, housing conditions that promote wellbeing, low carbon and energy efficient solutions, sustainable use of natural resources. It were concluded that this concept could be met through the development of bioeconomy.

Key words: bioeconomy, sustainable living environment, Latvia.

JEL code: Q5, Q57.

Introduction

According to statistical information (Eurostat, 2015a), around three quarter or 72.4 % of the European Union's population live in urban areas, and this share continues to grow, thus towns and cities are the centres of economic activity and social life. At the same time, the constant increase of population, a lack of strategic planning and poor environment management cause a lot of problems for the living environment and life quality. These problems can be considered as main drivers of societal challenges of the 21st century such as climate change, natural resource scarcity and environmental pollution that demand transformative change (McCormick K., Kautto N., 2013). Many examples can already be observed when the mentioned problems associated with living environment have become the main reason why people choose to leave urban areas and try to search residence with better living conditions.

Over the past two decades, biotechnology has provided a motor for environmentally sustainable production and for the development of a diverse

range of innovative products. The potential economic and environmental benefits of biotechnology have created a growing strategic interest in the bioeconomy (OECD, 2009). An early definition of bioeconomy offered by the OECD (2006) supposes that "*bioeconomy is the aggregate set of economic operations in a society that use the latent value incumbent in biological products and processes to capture new growth and welfare benefits for citizens and nations*". In more recent communication, the OECD (2009) has changed the concept defining bioeconomy as "*transforming life science knowledge into new, sustainable, eco-efficient and competitive products*". The United States of America (The White House, 2012) suggest that "*bioeconomy is based on the use of research and innovation in the biological sciences to create economic activity and public benefit*". In Europe, the concept of bio-based economy offered by the European Commission (2012) is very broadly used. This concept of the bio-based economy is also used in Finland and Sweden and states that "*a bio-based economy integrates the full range of natural and*

renewable biological resources – land and sea resources, biodiversity and biological materials (plant, animal and microbial), through the processing and the consumption of these bioresources". From such definitions, it can be concluded that concept of bioeconomy focuses on an economy which is based on the use of biomass resources rather than fossil-based products and systems. It can be also understood that bioeconomy is an economy where the basic materials, chemicals and energy are derived from renewable biological resources, such as plant and animal origin resources.

Such situation analysis served as the basis for the research **hypothesis**: bioeconomy can foster development of sustainable living environment in the cities. The defined hypothesis initiated the **aim** of this research: to provide the knowledge base for development of sustainable living environment in the cities through the bioeconomy. The following research **tasks** are advanced to achieve the set aim:

- 1) to explore living environment from the sustainability perspective;
- 2) to describe the key areas of life where bioeconomy can facilitate development of sustainable living environment in the cities.

To achieve the set aim and tasks of the research, the authors have used the publications and studies of foreign scientists and statistical data from Eurostat. The research authors widely have applied generally accepted research methods in economics, i.e. monographic descriptive method as well as analysis and synthesis methods to study the problem elements.

Research results and discussion

1. Exploration of living environment from the sustainability perspective

According to Muslim M.H. and co-authors (2012), living environment can be examined from various standpoints, such as an architectural,

been also pointed out that in recent decades, the interest in research on living environment has risen, and various approaches, concepts and viewpoints have been applied by housing researchers from an extensive range of disciplines (Muslim M.H. et al., 2012). In this research authors' have focused on exploring living environment from the ecological and environmental perspective as urban environmental problems are threats to present or future human well-being, resulting from human-induced damage to the physical environment, originating in or borne in urban areas (DANIDA, 2000).

Most of the European cities have common environmental problems such as poor air quality, high levels of traffic and congestion, poor-quality built environment, high levels of ambient noise, derelict land, greenhouse gas emissions, urban sprawl, generation of waste and wastewater. Danish International Development Agency (DANIDA, 2000) has ranged all of these problems by type of hazard in five groups:

- biological pathogens (pathogens in the open water bodies, at municipal dumps; contaminated water in piped systems);
- chemical pollutants (ambient air pollution from industry and motor vehicles; water pollution; hazardous wastes);
- physical hazards (traffic hazards; violence; natural disasters and impact because of inadequate attention to prevention and mitigation);
- citizens' access to land for housing (important influence on housing quality directly and indirectly);
- heat island effect and thermal inversions (raised temperatures a health risk).

There is a strong consensus among the European Union (EU) residents about the importance of environmental protection, the most worrying issues being air pollution and water

pollution (Eurostat, 2015b). Air pollution is both an environmental and a social problem, as it leads to a multitude of adverse effects on human health, ecosystems, the built environment and the climate. Air pollution poses the single largest environmental health risk in Europe today (EEA, 2015). Air pollution is, thereby, a complex problem that poses multiple challenges in terms of management and mitigation (EEA, 2015).

Since providing qualitative and sustainable living environment in urban areas has become an important issue, governments in national and international level have made policies and strategic planning documents with the aim to improve current conditions of living environment in cities and to make it sustainable for next generations.

Sustainable urban development - economic, social and environmental - is central also in the European Union's Regional Policy. Principle of sustainable development is included in the European Union's Lisbon Strategy (European Council, 2000), which defines that a competitive, knowledge-based economic growth must be in harmony with nature and culture as well as in the European Union's Sustainable Development Strategy (European Commission, 2009). In 2005, the European Commission approved the EU "Thematic Strategy on the Urban Environment" which sets goals and objectives for improving the urban environment and promotes sustainable development in the large cities. As a continuation of the Lisbon Strategy in 2010, the Europe 2020 (European Commission, 2010) strategy was created which aim is "smart, sustainable and inclusive growth", and urban areas are considered as being central to achieving its targets. Sustainable growth in this strategy means: to promote a more competitive economy in which resources are used efficiently and sustainably, while carbon dioxide emissions should be as low as possible; to protect the environment and to prevent the loss of biodiversity; to strengthen European leadership

in developing new green technologies and production methods. Furthermore, urban development issues have been integrated, to a large extent, into regional and national programmes supported by structural and cohesion funds, principally the European Regional Development Fund (ERDF) and the European Social Fund (ESF). For example, during the period 2014–2020, each EU Member State should invest at least 5 % of the ERDF in sustainable urban development.

Such situation analysis let the authors to conclude that sustainable living environment in the cities should be developed on the conceptual basis (Figure 1).

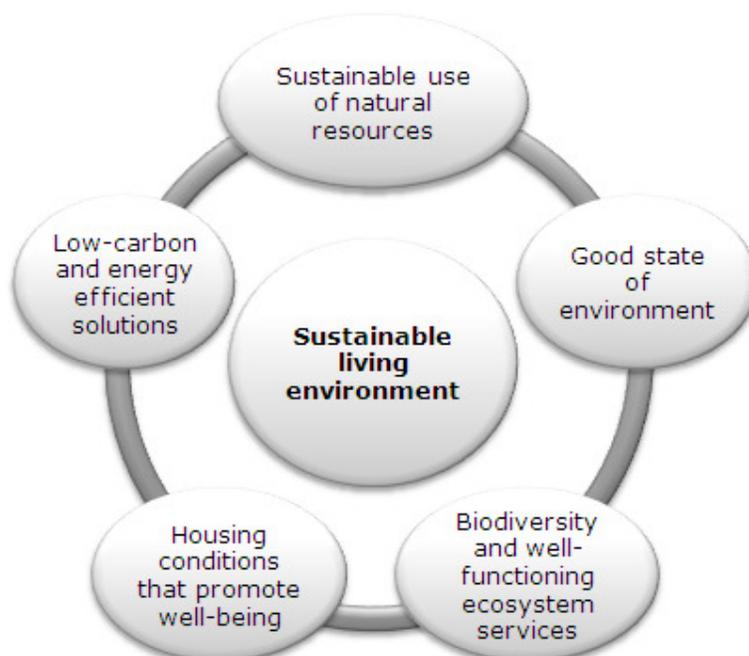
According to information summarized in Figure 1, the concept of sustainable living environment should focus on the following: good state of environment, biodiversity and well functioning ecosystem services, housing conditions that promote wellbeing, low carbon and energy efficient solutions, sustainable use of natural resources. In the second part of this research, the authors have explored how this concept can be met through the development of bioeconomy.

2. Key areas of life where bioeconomy can facilitate development of sustainable living environment in the cities

In the frame of this study more recent definition of bioeconomy were used (European Commission, 2012). In this definition bioeconomy encompasses the sustainable production of renewable resources from land, fisheries and aquaculture and their conversion into food, feed, fibre, bio-based products and bio-energy as well as the related public goods. Such definition indicates that according to concept of bioeconomy biomass resources are transformed into competitive bioeconomy products. The total bioeconomy includes:

- the traditional biobased sectors such as agriculture, horticulture, forestry, fisheries, food and feed, pulp and paper;

- the new biobased sectors such as biotextile, biochemistry, bioenergy and biotechnology.



Source: authors' construction adopted from Ministry of the Environment of Finland, 2015

Fig. 1. **Concept of sustainable living environment**

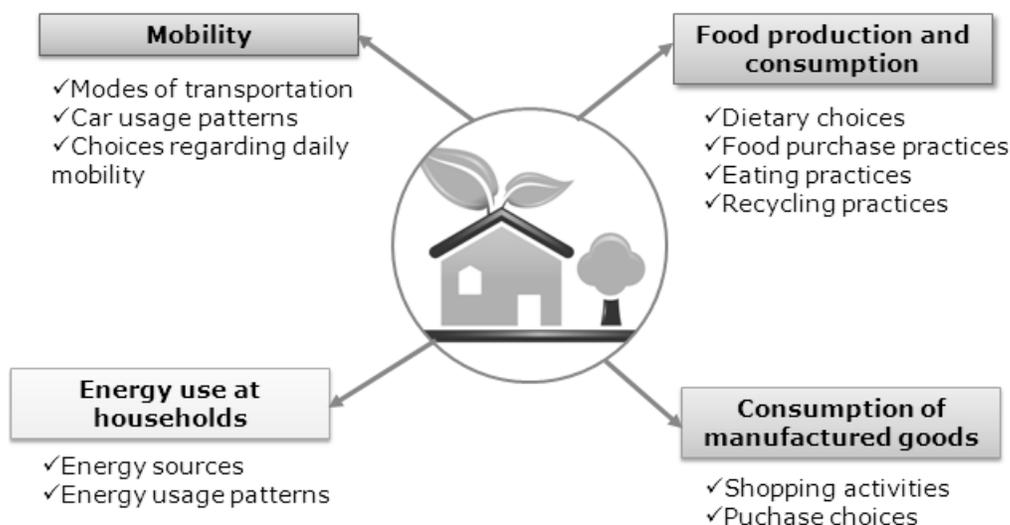
Therefore, food security, energy security, sustainable production, public health, natural resources, climate change, economic and social development are main advantages and benefits from development of bioeconomy.

In the context of this study authors would like to point out that bioeconomy relies on renewable natural resources to produce food, energy, products and services. It means that bioeconomy goes in line with the principles of sustainable development, and thus also it affects development of sustainable living environment in the cities.

However, according to A. Dumitru and co-authors (2015), alternative conception for living environment and lifestyles that would support bioeconomy products are only possible if there is presence of social acceptability as well as reasonable level of wellbeing and relatively fair distribution of opportunities and resources.

In order to meet the set aim of this study authors presumed that living environment is highly connected with and influenced by people lifestyles. This corresponds to L. Rydén and co-authors (2003) that state that "*way we live, our lifestyle, is what leads to environmental impact*". Although A. Dumitru and co-authors (2015) point out that lifestyle is outcome of many different decisions and behaviours, which, taken together, have a certain environmental impact. Thus, concept of sustainable lifestyles implies that - the more person acts sustainably, the more sustainable this person lifestyle would become.

On the basis of previous research (Dumitru A. et al., 2015; Finland Ministry of the Environment, 2015; Rydén L. et al., 2003), the authors have identified the main areas of life and people's choices where bioeconomy can facilitate development of sustainable living environment (Figure 2).



Source: authors' construction adopted from Dumitru A. et al., 2015

Fig. 2. Areas of life where bioeconomy can facilitate development of sustainable living environment in the cities

The choices that people make regarding the main life areas – food production and consumption; consumption of manufactured goods; energy use at households; mobility – can open the way for the re-thinking of conditions for societal transformations towards sustainability. However, lessons from lifestyle changes supported by the different municipalities in Sweden (Rydén, L. et al., 2003) have shown that:

- the alternatives leading to sustainable development must be made attractive;
- the alternatives should be close to the citizens, easily accessible, and visible;
- information about the alternatives should be communicated in a clear and personal way;
- local authorities have a responsibility to support and encourage citizens to take their own initiatives;
- feed-back is very important.

Such considerations let the authors to conclude that in order to facilitate development of sustainable living environment in the cities there is a need for further research giving understanding about people's choices between traditional products and products (i.e. food,

energy, manufactures goods, services) produced from renewable natural resources and their motivation to change their lifestyle.

Conclusions

- 1) Around three quarter or 72.4% of the European Union's population live in urban areas, and this share continues to grow, however, constant increase of population, a lack of strategic planning and poor environment management cause a lot of environmental problems such as climate change, natural resource scarcity and environmental pollution that demand transformative change.
- 2) Provision of qualitative and sustainable living environment in urban areas has become an important issue. According to the present research findings, the concept of sustainable living environment should focus on the following: good state of environment, biodiversity and well functioning ecosystem services, housing conditions that promote wellbeing, low carbon and energy efficient solutions, sustainable use of natural resources.

3) Main areas of life where bioeconomy can facilitate development of sustainable living environment are food production and consumption; consumption of manufactured goods; energy use at households; mobility. The choices that people make regarding these life areas can open the way for the re-thinking of conditions for societal transformations

towards sustainability. However, there is a need for deeper understanding about people's choices between traditional products and products (i.e. food, energy, manufactures goods, services) produced from renewable natural resources and people's motivation to change their lifestyle.

Bibliography

1. DANIDA (2000). Improving the Urban Environment and Reducing Poverty. Workshop paper. Retrieved: <http://web.mit.edu/urbanupgrading/urbanenvironment/issues/introduction.html>. Access: 12.12.2000.
2. Dumitru, A., Garcia-Mira, R., Mascsinga, I., Diaz-Ayude, A., Pandur, V., Dumitru, I., Sava, A. (2015). Green Lifestyles Alternative Models and Up-scaling Regional Sustainability/ GLAMURS. Retrieved: http://www.glamurs.eu/wp-content/uploads/2015/10/WP4_Deliverable-D4.1.pdf. Access: 11.12.2015.
3. EEA (2015) *Air Quality in Europe – 2015 report*. Luxembourg: Publications Office of the European Union, p. 64.
4. European Commission (2009). *Review of the European Union Strategy for Sustainable Development, COM(2009) 400 final*. Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52009DC0400>. Access: 06.01.2016.
5. European Commission (2010). *EUROPE 2020. A Strategy for Smart, Sustainable and Inclusive Growth*. European Commission: Brussels, Belgium, 37 p. Retrieved: <http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf>. Access: 06.01.2016.
6. European Commission (2012). *Innovating for Sustainable Growth: A Bioeconomy for Europe*; COM (2012) 60 final. European Commission: Brussels, Belgium, 9 p. Retrieved: http://ec.europa.eu/research/bioeconomy/pdf/201202_innovating_sustainable_growth_en.pdf. Access: 12.12.2015.
7. European Council (2000). *Presidency Conclusions. Lisbon European Council*. Retrieved: http://www.consilium.europa.eu/lv/uedocs/cms_data/docs/pressdata/en/ec/00100-r1.en0.htm. Access: 06.01.2016.
8. Eurostat (2015a). *Statistics on European Cities*. Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_European_cities. Access: 20.12.2015.
9. Eurostat (2015b). *Quality of Life in Europe - Facts and Views - Overall Life Satisfaction*. Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_in_Europe_-_facts_and_views_-_overall_life_satisfaction. Access: 13.12.2015.
10. Ministry of the Environment of Finland (2015). *Strategy 2022 - A Better Environment for Future Generations*. Retrieved: http://www.ymp.fi/en-US/The_Ministry/Goals_and_results/Strategy_2022. Access: 11.12.2015.
11. McCormick, K., Kautto, N. (2013). *The Bioeconomy in Europe: An Overview*. In: *Sustainability*, 5, pp. 2589-2608.
12. Muslim, M.H., Karim, H.A., Abdullah I.C. (2012). Satisfaction of Students' Living Environment between On-Campus and Off-Campus Settings: A Conceptual Overview. In: *Procedia - Social and Behavioural Sciences*, Volume 68, pp. 601-614.
13. OECD (2006). *The Bioeconomy to 2030: Designing a Policy Agenda*. Retrieved: <http://www.oecd.org/sti/biotech/34823102.pdf>. Access: 12.12.2015.
14. OECD (2009). *The Bioeconomy to 2030: Designing a Policy Agenda, Main Findings. Organisation for Economic Cooperation and Development*: Paris, France, 18 p.
15. Rydén, L., Filho, W.L., Skubala, P., Kronlid, D. (2003). *Behaviour and the Environment. Ethics, Education and Lifestyles*. In: Rydén, L. (ed.) (2003). *Environmental Science: Understanding, Protecting and Managing the Environment in the Baltic Sea Region*. Uppsala: The Baltic University Press, 800 p.
16. The White House (2012). *National Bioeconomy Blueprint*. Retrieved: https://www.whitehouse.gov/sites/default/files/microsites/ostp/national_bioeconomy_blueprint_april_2012.pdf. Access: 20.12.2015.

FABA BEANS AS AN ALTERNATIVE PROTEIN SOURCE FOR BROILER CHICKEN FEED

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Abstract. A lower price on poultry meat, compared with other meats (beef, pork etc.), affects the increasing demand for poultry meat. The productivity and production cost of broiler chickens are directly related to the amount of feed fed, the proportion of crude protein in the feed, and the biological value and price of the feed. The EU produces only 30% of the protein crops used for feed; thus, the large import of protein feed crops contribute to agricultural instability and production cost increases. To reduce the consumption of imported protein feeds and the production cost of poultry meat, it is necessary to assess opportunities to use a domestic protein crop as faba beans. The research aim is to identify economic gains from the production of broiler chicken meat if using domestic faba beans in broiler chicken diets. Specific research tasks are as follows: 1) to identify the effect of the use of faba beans on the cost of broiler chicken feed; 2) to assess changes in broiler chicken productivity due to faba bean diets. It is economically efficient to replace soybean protein with domestically produced faba beans in the feed ration for broiler chickens; it provides an adequate amount of crude protein and reduces the feed conversion ratio and production costs. A faba bean ration in the broiler chicken diet provides the broilers with necessary nutrients, thereby contributing to their growth and increases in their live weight, reducing feed costs and resulting in increases in economic return.

Key words: poultry production, production efficiency, legumes, faba beans in broiler diets.

JEL code: O 13

Introduction

The consumption of poultry meat tended to increase in many countries in the world in the last decades (Martinez et al., 2011; Poulta et al., 2010). A lower price on poultry meat, compared with other meats (beef, pork etc.), affects the increasing demand for poultry meat. The productivity and production cost of broiler chickens are directly related to the amount of feed fed, the proportion of crude protein in the feed, and the biological value and price of the feed. Although approximately 70 % of total production cost in poultry farming relates to feed (Marcu et al., 2013), increases in production efficiency and low production costs of poultry meat are achieved by means of a short production cycle, fast-growing broiler chicken crosses and complete, protein-rich diets.

Poultry diets mostly consist of maize, wheat and soya flour; for this reason, increases in the price of grains and protein feeds on the global market undoubtedly affect the production cost of poultry meat. As stated by the European Parliament, a considerable proportion of imported maize and soya used in animal diets is genetically modified. At the same time, producers of

livestock products in the EU cannot do without plant protein imports from third countries, as there is a lack of crude protein-rich feedstuffs produced in the EU. The EU produces only 30 % of the total quantity of protein feed crops (Protein Crops..., 2014). Large imports of protein crops contribute to agricultural instability and negatively influence agricultural producers as well cause price volatility. The dependence of EU food producers on feed market price fluctuations affects the production cost of their products as well. According to the forecasts of Food and Agriculture Organisation of the United Nations, the price on grain (maize) is going to rise by 20 % in the period 2011-2020, which will hike the price of meat (poultry) by 30 % (AVEC Annual Report, 2012).

In Latvia, too, poultry enterprises provide the necessary protein level in poultry diets, including broiler chicken diets, with imported crude protein-rich feedstuffs. They are: feed yeast, soya, sunflower oil meal, maize flour etc. According to analyses of data on production costs in livestock farming, the greatest expenditures relate to feed costs; yet, a detailed analysis of costs shows that the greatest costs may be attributed to imported feed, its components,

whereas the proportion of costs of domestic and own-produced feed is insignificant. So, to reduce the consumption of imported protein-rich feedstuffs in agricultural animal and poultry diets and to lower the production cost of meat, it is necessary to use protein crops produced domestically.

In recent years, the area sown with legumes (faba beans, peas), which is an important source of feed protein, considerably increased in Latvia. The total area under faba beans increased 19 times from 2010 to 2015 – from 1.3 thou ha in 2010 to 25.9 thou ha in 2015 –, while the area cropped with peas rose 3.2 times during the same period – from 1.2 thou ha in 2010 to 3.8 thou ha in 2015 (RSS, 2015).

Such a sharp increase in the area sown with faba beans has been promoted by the EU policy aimed at protecting and enhancing biological diversity on agricultural holdings. Legumes considerably reduce CO₂ emissions, thus, reducing the imports and consumption of mineral nitrogen. According to the EU Regulation No 1307/2013, a new payment scheme aimed at climate- and environment-friendly agricultural practices or the green payment scheme, which is closely associated with the single area payment scheme, is available within the direct payments scheme. The area sown with nitrogen-absorbing crops, including the area under faba beans, is eligible for the green payment scheme (RSS, 2015).

Faba beans are a high-yield crop whose economic role is very significant. Faba beans are an excellent feed concentrate for domestic poultry and agricultural animals, as they contain 22-35% protein, according to some research studies, even 26-38% protein (Zute, 2014). This means that a mixture of faba beans and peas, which contain 20-23% protein, can provide the necessary amount of protein for poultry as well as increase the proportion of domestic protein-rich feedstuffs and lower the production cost of

products in farming, i.e. to reach higher efficiency.

Although faba beans are a significant source of protein, a few research studies on the use of domestically grown faba beans in agricultural animal and poultry diets in the economic aspect have been conducted to date. That is why, the research aim is to identify economic gains from the production of broiler chicken meat if using domestic faba beans in broiler chicken diets. To achieve the **aim**, the following specific research **tasks** were set: 1) to identify the effect of use of faba beans on the cost of broiler chicken feed; 2) to assess changes in broiler chicken productivity due to faba bean diets.

Materials and methods

The economic efficiency of use of protein-rich crops grown in Latvia for broiler chicken diets was assessed employing the experimental method, i.e. faba beans and their mixture with peas were added to the diets, so that the dietary component examined represents the key factor affecting the productivity of broiler chickens. The analytical research employed the monographic method, analysis and synthesis, data grouping etc. The research used research papers by national and foreign scientists, data provided by the Rural Support Service (RSS) and the Central Statistical Bureau as well as findings of the research project "Enhancing of Legumes Growing in Europe through Sustainable Cropping for Protein Supply for Food and Feed" (EUROLEGUME).

The feeding experiment was conducted on broiler chickens of the cross Ross 308, which were split into four analogous groups (n=30). The chickens were reared in an intensive system on the permanent litter, with a density of 12 chicks on 1 m² under adequate animal welfare conditions. Feed and drinking water were persistently available to all group chickens.

In accordance with the recommendations for rearing the cross Ross 308, the chickens are sold at the age of 38-42 days (Broilers ROSS

Management Handbook, 2014). The bodyweight at slaughter increased progressively with the age. The net gain, which takes into account both the feed and rearing costs, reached a maximum between 42 and 49 days of age, and then decreased (Baeza et al., 2011). Poultry enterprises traditionally use a 42-day broiler production cycle (Kleyn, 2002).

Based on the intensity of growth of broilers and their organism requirements, diets for broilers are divided into three stages: pre-start (0-10 days), grower (11-26 days) and finisher (27 days to the selling age). All group broilers were fed diets of equal energy content that were balanced in accordance with the nutrition specifications for the cross ROSS 308 (Broilers ROSS Management Handbook, 2014).

To provide the necessary amount of crude protein in the diet, the broiler ration was supplemented with wheat grains and soybean oil meal in accordance with the standards adopted in the country. Starting from the 11th day, the experimental groups' diets were supplemented with faba beans and their mixture with peas in different amounts, proportionally reducing the amount of soybean oil meal (3-8%) in the ration of each experimental group according to the experimental scheme (Table 1).

The economic efficiency of consumption of feed by broilers was identified using the feed conversion ratio that may be calculated by formula 1:

$$FCR = \frac{\text{Total Feed Consumed}}{\text{Total Live Weight}} \quad (1)$$

where:

FCR - feed conversion ratio (ROSS-308 Broilers Management Handbook, 2014).

However, the economic indicators of broiler productivity and growth were calculated using the production efficiency factor. It takes into account the live weight, age and survival of broilers and their feed conversion and may be calculated by the formula 2:

$$PEF = \frac{\text{Livability} \times \text{Live Weight (kg)}}{\text{Age in Days} \times \text{FCR}} \times 100 \quad (2)$$

Where:

PEF - production efficiency factor;

FCR - feed conversion ratio (Broilers ROSS Management Handbook, 2014).

Data on broiler chicken live weight were analysed by the analysis of variance (ANOVA) at the significance level $\alpha=0.05$.

Research results and discussion

Effect of faba bean diets on broiler chicken feed costs

In raising the production efficiency of broiler chicken meat, it is important to achieve increases in the live weight of broilers as well as to reduce the cost of feed consumption in order to increase the productivity efficiency index. In this aspect, an important factor is the cost of feed and the cost of crude protein available in feed.

The soybean oil meal added to the experimental feed mixture contained, on average, 50.61 % crude protein in the dry matter sample and 44.24 % in the natural one. However, the amount of crude protein in the dry matter of faba beans ranged from 26.86 % to 31.68 %, while for peas it ranged within 18.57-26.38 %. The soybean oil meal contained 1.72-1.96 times more crude protein than it was in peas and faba beans; it indicated that peas and beans could not fully replace soybean oil meal in standard poultry feed mixtures because of a lower crude protein content – the crude protein was substituted only partially.

To provide the amount of crude protein needed for broilers at the growth stage (10-26 days), they were fed a diet containing 28-30 % soybean oil meal, while at the finishing stage (from 27 days) they were fed a diet with 18-24 % soybean oil meal (Ross 308 Broiler: Nutrition Specifications, 2014).

Basic and conditioned feeds evaluated in the dietary experiment on broiler chickens

Broiler group	Experimental feed ration
Group 1 – control (n=30)	Basic feed (BF)
Group 2 – trial (n=30)	BF with 5% Vicia faba minora 'Lielplatone'
Group 3 – trial (n=30)	BF with 10% Vicia faba minora 'Lielplatone'
Group 4 – trial (n=30)	BF with 10% Pisum sativum 'Bruno' + 5% Vicia faba minora 'Lielplatone'

Source: authors' construction based on the feeding experiment

At the growth and fattening stages, 3-8% beans and peas grown in Latvia, which reduced soybean oil meal in the ration for the experimental groups was replaced with faba (Table 2).

Table 2

Cost of feeds used for broilers in the dietary experiment

Indicator	Growth stage (11-26 day)				Finishing stage (27-42 day)			
	1*	2	3	4	1*	2	3	4
Soybean meal content in feed, %	28.00	25.06	22.11	20.05	21.00	18.06	15.12	13.04
Cost of feed with soybean meal, EUR	0.48	0.43	0.38	0.34	0.44	0.38	0.32	0.27
Pea content, g kg ⁻¹ feed	-	-	-	100.0	-	-	-	100.0
Pea price, EUR kg ⁻¹ feed	-	-	-	0.03	-	-	-	0.03
Faba bean content, g kg ⁻¹ feed	-	50.0	100.0	50.0	-	50.0	100.0	50.0
Faba bean price, EUR kg ⁻¹ feed	-	0.01	0.03	0.01	-	0.01	0.03	0.01
Feed price, total, EUR kg ⁻¹	0.480	0.44	0.41	0.39	0.44	0.39	0.35	0.32
Feed price to control, EUR		-0.04	-0.07	-0.09	-	-0.05	-0.09	-0.12

* control group

Source: authors' calculations based on the dietary experiment

The market price of faba beans and peas grown in Latvia was 0.29-0.30 EUR kg⁻¹ on average, while that of soybean oil meal was 0.65 EUR kg⁻¹. The price of feed for the control group at the intensive growth stage (11-26 days) was 0.48 EUR kg⁻¹ and 0.44 EUR kg⁻¹ on average at the fattening stage (from 27 days). By replacing soybeans with faba beans and peas in the diet for the experimental groups, the cost of a unit of feed decreased by 0.04-0.09 EUR kg⁻¹. As one

can see, the cost of faba beans and peas is lower than that of soybean oil meal; yet, the amount of crude protein and its cost per feed unit are important in identifying the economic efficiency of feedstuffs (Table 3).

According to the calculations, the cost of crude protein available in soybean oil meal is 0.18-0.38 EUR kg⁻¹ higher than that in faba beans and peas (Table 3).

Costs of crude protein of peas, beans and soya meal

Indicator	Peas	Faba beans	Soybean meal
Trial feed trading price, EUR kg ⁻¹	0.30	0.29	0.65
Protein content in feed, g kg ⁻¹	232.07	265.62	442.38
Cost of crude protein, EUR kg ⁻¹	1.29	1.09	1.47
Cost of crude protein, as compared with soybean meal, EUR kg ⁻¹	-0.18	-0.38	-

Source: authors' calculations based on the feeding experiment

Table 4

Feed consumption and feed costs for trial broilers

Indicator	Experimental group			
	1*	2	3	4
Growth stage feed costs, EUR kg ⁻¹	0.480	0.443	0.408	0.388
Finishing stage feed costs, EUR kg ⁻¹	0.440	0.392	0.346	0.317
Average feed costs, EUR kg ⁻¹	0.460	0.418	0.377	0.353
Feed consumption per broiler during the breeding period, kg	4.30	4.30	4.40	4.36
Total feed cost for growing a broiler, EUR	1.978	1.795	1.659	1.537
compared with the control group, EUR	-	-0.183	-0.319	-0.441
compared with the control group, %	-	-9.25	-16.13	-22.30
Feed costs for production of 1 kg live weight gain, EUR	0.758	0.667	0.609	0.578
compared with the control group, EUR	-	-0.091	-0.149	-0.180
compared with the control group, %	-	-12.01	-19.66	-23.75

* control group

Source: authors' calculations based on the feeding experiment

The price of feed for the control group was 0.48 EUR kg⁻¹ at the growth stage (11-26 days) and 0.44 EUR kg⁻¹ at the finishing stage (27-42 days). By including peas and beans grown in Latvia in the diet (for the experimental groups), the costs of feed fed to the broilers were within the ranges of 0.388-0.443 EUR kg⁻¹ (11-26 days) and 0.317-0.392 EUR kg⁻¹ (27-42 days). Overall, the cost of feed to produce a broiler in the control group (Group 1) was the highest (EUR 1.978), whereas that in the experimental groups was 9.25-22.3 % lower, i. e. from EUR 1.795 (Group 2) to EUR 1.537 (Group 4). The decrease in feed cost to produce 1 kg of live weight of broilers for the experimental groups reached 12.01-23.75 %

compared with the control group. It means that it was possible to provide an adequate amount of crude protein and to lower the unit production cost by replacing soybean oil meal with peas and faba beans in the broiler diet for the experimental groups.

Effect of faba bean and pea diets on broiler chicken productivity

The efficiency of use of peas and faba beans in broiler diets was assessed according to the most important productivity indicators: change in live weight, daily live weight gain rate, feed consumption, cost per 1 kg live weight and productivity index.

The live weight of broilers at the selling age, i. e. 42 days of age was, on average, from

2608.93±284.73 g for group 1 (control) to
2725.10±299.47 g for group 3 (with 10 % faba

beans in the diet) (Table 5).

Table 5

Broiler chicken live weight control before feed change and prior to slaughter

Group	Broiler chicken live weight, g		
	10 days of age	27 days of age	42 days of age
Group 1 – control	284.81 ± 21.36	1503.85 ± 171.46	2608.93 ± 284.73
Group 2 – trial	290.89 ± 27.22	1725.11 ± 237.05	2690.56 ± 298.10
Group 3 – trial	288.23 ± 19.19	1706.20 ± 173.55	2725.10 ± 299.47
Group 4 – trial	271.50 ± 22.12	1657.83 ± 185.29	2660.53 ± 312.18
Group	P value comparison between the control and trial groups		
Group 1 – control	-	-	-
Group 2 – trial	NS	S*	NS
Group 3 – trial	NS	S*	NS
Group 4 – trial	S**	S*	NS

Data are presented as means ± SD (standard deviation); S** significant difference ($P < 0.05$), less live weight; S*: significant difference ($P < 0.05$), higher live weight; NS: not significant difference ($P > 0.05$)

Source: authors' calculations based on the feeding experiment

Although the live weight of broilers at the age of 42 days in all the experimental groups exceeded the control group indicators by 1.97-4.45 %, yet, no statistical differences were observed among the groups (Table 5). It has to be noted that before the experiment the live weight of broilers in group 4 was considerably lower ($P < 0.05$); yet, after replacing soya protein with a 5 % mixture of faba beans and peas, an intensive live weight gain increase was achieved and at the age of 27 days the live weight of broilers (1657.83 g) in this group was significantly greater ($P < 0.05$) than that in the control group (Table 5).

Feed absorption and conversion is an important criterion that affects the productivity of broilers. The effectiveness of use of feed is characterised by the feed conversion ratio (FCR), which is computed as a ratio of the amount of feed consumed to the gain in live weight. In broilers highest proportion from feed ingested are used for growth because for maintenance function have low requirements. Therefore, feed efficiency is very good in broilers which induced decreased FCR value (Leeson et al., 1996). A

lower FCR indicates better feed conversion and higher economic efficiency, which means that less feed has to be consumed to gain 1 kg live weight of broilers.

The real consumption of feed for group 3 and group 4 was higher by 1.39-2.32 % than that for the control group, while the consumption of feed for group 2 was similar to that for the control group. However, feed conversion for all the experimental groups after faba beans and peas were added to feed mixtures was lower by 0.61-3.64 % than that for the control group. The highest feed conversion ratio was observed for the control group at 1.65 kg feed per kg live weight gain. The best results were achieved in group 2 where 1.65 kg feed were necessary to produce 1 kg live weight, which was 0.05 kg less than for the control group (Table 6). It indicates that the conversion of nutrients in the intestinal tract of broilers in this group took place more intensively than that in the other experimental groups. High feed consumption to produce 1 kg live weight was observed for group 4 (1.64 kg/kg). It means that in such a combination, the use of the mixture of faba

beans and peas is as effective and efficient as the

use of a single legume in the broiler diet.

Table 6

Productivity per broiler chicken obtained in the dietary experiment

Indicator	Experimental groups			
	1*	2	3	4
Broiler chicken live weight at the age of 42 days, g	2608.93 ±284.73	2689.75 ±298.10	2725.10 ±299.47	2660.53 ±312.18
% relative to control	100.00	103.09	104.45	101.97
Feed consumption per broiler during the breeding period, kg	4.30	4.30	4.40	4.36
% relative to control	100.00	100.00	102.32	101.39
Feed conversion ratio (FCR), kg kg ⁻¹	1.65	1.60	1.61	1.64
% relative to control	100.00	96.36	97.57	99.39
Production efficiency factor (PEF)	383.96	408.11	409.39	393.80
± relative to control	-	24.16	25.44	9.85

* control group; Data are presented as means ±SD (standard deviation)

Source: authors' calculations based on the feeding experiment

The economic aspects of interaction among the live weight, survival, feed conversion and production length of broilers are characterised by the production efficiency factor (PEF). The highest PEF indicates optimum return on production resources (Samarakoon, Samarasinghe, 2012). It shows that the most appropriate selling age of broilers is reached at the highest PEF. In the context of the experiments, the PEF was employed to identify economic return on feeding faba beans compared with the use of soya protein in the broiler diet.

The PEF for all the experimental groups was 9.85-25.44 units higher than that for the control group (383.96), which proves that it is economically efficient to replace some amount of soya protein with the protein of faba beans and peas grown domestically in the broiler diet. The highest PEF was identified for group 3 at 409.39, i.e. 25.44 units more than for the control group (Table 6).

Conclusions, proposals, recommendations

1) By replacing soya with faba beans and peas in the diets of broilers in the experimental groups, the feed unit cost

decreased by 0.04-0.09 EUR kg⁻¹. The costs of 1 kg crude protein in faba beans (1.09 EUR kg⁻¹) and peas (1.29 EUR kg⁻¹) were lower - EUR 0.38 and EUR 0.18, respectively compared with the cost of crude protein in soybeans (1.47 EUR kg⁻¹).

2) The cost of feed to produce a broiler was the highest for the control group (EUR 1.978), while the lowest cost was observed for group 4 (EUR 1.537); the costs for the experimental groups were 9.25-22.3 % lower.

3) At the age of 42 days, the live weight gain rates for all the experimental groups exceeded that for the control group by 1.97-4.45 %, which indicated higher feed conversion for the experimental groups; yet, no statistically significant differences were observed among the groups.

4) Feed conversion or the consumption of feed to gain 1 kg live weight for all the experimental groups after faba beans and peas were added to feed mixtures was lower by 0.61-3.64 % than that for the control group.

5) The production efficiency factor for all the experimental groups was lower

(by 9.85-25.44 units) compared with the control group; it indicates it is economically efficient to replace some amount of soya protein with the protein of faba beans and peas grown domestically in the broiler diet.

6) The experimental results showed that the rations of faba beans in the broiler diet, which replace soybean oil meal, meet the physiological requirements of the organism of broilers and provides the broilers with necessary nutrients, thereby contributing to

their growth and increases in their live weight, reducing feed costs and resulting in increases in economic return.

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Bibliography

1. AVEC Annual Report 2012 (2012). Belgium: Association of Poultry Processors and Poultry Trade in the EU Countries - ASBL, p. 52.
2. Baeza, E., Arnould, C., Jlali, M., Chartrin, P., Gigaud, V., Mercierand, F., Durand, C., Meteau, K., Le Bihan-Duval, E., Berri, C. (2011). Influence of Increasing Slaughter Age of Chickens on Meat Quality, Welfare, and Technical and Economic Results. *Journal of Animal Science*, Volume 90, pp. 2003-2013. American Society of Animal Science, Champaign. Retrieved: <http://www.journalofanimalscience.org/content/90/6/2003.full.pdf+html>. Access: 5.01.2016.
3. Broiler Ross Management Handbook (2014). Ross an Aviagen Brand. Retrieved: http://en.aviagen.com/assets/Tech_Center/Ross_Broiler/Ross-Broiler-Handbook-2014i-EN.pdf. Access: 15.12.2015.
4. EU REGULATION No 1307/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (2013) Establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009 Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013R1307&from=LV> Access: 15.12.2015.
5. Kleyn, R. (2002). Strategies for Managing Expensive Feed on Farm. Retrieved: <http://spesfeed.com/?wpdmact=process&did=NDQuaG90bGluaw==> Access: 08.09.2015.
6. Leeson, S., Caston, L.J., Summers, J.D. (1996). Broiler Response to Diet Energy, *Poultry Science*, Volume 75, pp. 529-535.
7. Marcu, A., Vacaru-Opriş, I., Dumitrescu, G., Petculescu Ciochină, L., Marcu, A., Nicula, M., Peţ, I., Dronca, D., Kelciov, B., Mariş, C. (2013). The Influence of Genetics on Economic Efficiency of Broiler Chickens Growth. *Scientific Papers: Animal Science and Biotechnologies*, Volume 46, Issue 2, pp. 339-346.
8. Martinez Michel, L., Anders, S., Wismer, W.V. (2011). Consumer Preferences and Willingness to Pay for Value-Added Chicken Product Attributes. *Journal of Food Science*. Volume 76, Issue 8, pp. 469-477.
9. Poulta, E., Heikkilä, J., Forsman-Hugg, S., Isoniemi, M., Makela, J. (2010). Consumer Choice of Broiler Meat: the Effects of Country Origin and Production Methods. *Food Quality and Preference*, Volume 21, Issue 5, pp. 539-546.
10. Protein Crops: final report (2014) EIP-AGRI Focus Group. Retrieved: https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/fg2_protein_crops_final_report_2014_en.pdf. Access: 16.12.2015.
11. Rural Support Service (RSS) (2015). Area Payments. Retrieved: <http://lad.gov.lv/lv/statistika/platibu-maksajumi/>. Access: 05.01.2016.
12. Samarakoon, S.M.R., Samarasinghe, K. (2012). Strategies to Improve the Cost Effectiveness of Broiler Production. *Tropical Agricultural Research*, Volume 23, Issue 4, pp. 338-346.
13. Zute, S. (2014) Legumes – an Alternative for Soybeans in the Production of Protein-rich Feed Concentrate: Agrotechnological and Economic Justification for the Conditions in Latvia. 2014 data (in Latvian). Retrieved: http://www.stendeselekcija.lv/jaunumi/data/augsuplades/files/Paksaugi_VSGSI_11022015.pdf. Access: 05.01.2016.

BIOECONOMICS AS AN INTERDISCIPLINARY SCIENCE

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Abstract. The aim of this paper is to identify and elucidate the bioeconomics, which traces the links among biology and economy, as a relatively new field of economics and political economy. To make a clear distinction between bioeconomics and bioeconomy, the paper presents a set of definitions of both categories and explains the reasoning behind them. This research is of theoretical nature and is based on extensive review of the scientific literature dealing with the relationship of biology with social sciences, including theories of leading contributors to economic thought. Such phenomena as evolution, cooperation, competition over scarce resources, selection, work division, signalling, territorialism and migration are the common to the economy of nature and the human economy. The study finds out that the conceptual and methodological trade between economic discourse and biological discourse goes back, at least, to the 18th century but many parallels between economic and social behaviour of humans and biology were observed and studied much earlier. Contemporary bioeconomists argue that economics and biology can mutually enrich each other, emphasize on what biology can be taught from economics and how economics can accommodate insights from biology.

Key words: bioeconomics, bioeconomy, economics, history of economic thought.

JEL code: Q57, A12, B52

Introduction

Many problems and challenges in today's world require economic sciences to work effectively with other disciplines. As Popper puts it, "*We are not students of some subject matter but students of problems. And problems may cut right across the borders of any subject matter or discipline*" (Popper, 1963).

Economics is a social science, born out of philosophy and history but drawing of the insights of sociology, geography, psychology, the study of law, government and politics, and, to a rising extent, the natural sciences, including biological and environmental sciences that offer very much to economic scientists. Obviously, any well-educated economist knows that the beginning of economics (political economy) as a modern academic discipline has been marked by the publishing of Adam Smith's "*An Inquiry into the Nature and Causes of the Wealth of Nations*" in 1776. Smith and other classics, however, did not build their theories in a vacuum but were influenced by the precursors of economics and the natural scientists as well.

The focus in this paper is, generally, on the interactions between economics and biology. Its purpose is to present a relatively new branch of

economics and political economy called bioeconomics. As terms bioeconomics and bioeconomy are often used interchangeably, the paper task is to provide precise definitions and interpretations of both in order to demonstrate the distinction between them. The research is theoretically descriptive in nature and is rooted in extensive examination of literature on the relationship of biology sciences with social sciences, including theories of leading contributors of economic thought. As it will be shown in the next section of the paper, biology and economics have interacted for centuries, and many scholars studying economic phenomena and processes were referring to biology.

The term "*bioeconomics*" (bionomics, economic biology, biological economy and environmental economics as antecedents), which comprises two words: biology and economics, suggests that bioeconomics can be viewed as interdisciplinary discipline or research which closely ties economics to natural sciences (e.g. evolutionary biology). Robert Axelrod (2008) describes interdisciplinary research as a mode of research that integrates information, techniques, perspectives, concepts and/or theory from two or more disciplines or bodies of organized or

specialized knowledge. According to National Academies of Science (2004), its purpose is to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or field of research.

Research results and discussion

1. What is the bioeconomics?

As it was said before, bioeconomics is a framework that brings together two scientific disciplines: economics and biology. The term "bioeconomics" was coined by British biologist Hermann Reinheimer in his work "Evolution by Co-operation: A Study in Bioeconomics" published in 1913. Definitions of bioeconomics

proposed by him and other authors in various research publications are provided in Table 1.

Bioeconomists maintain that the applicability of standard economic theory's constrained maximization (optimisation) framework is not confined to human behaviour and that this optimisation framework is suitable to describe behaviour of all evolved creatures throughout the animal kingdom (Vromen, 2007). They also insist that human socio-economic organization involves and depends on the human organism in its natural environment, and study how metaphors from biology can be used in economics and vice versa.

Table 1

Selected definitions of bioeconomics

Authors	Definitions
Reinheimer, 1913	The study of how organisms of all kinds earn their living in "nature's economy" with particular emphasis on co-operative interactions and the progressive elaboration of the division of labour.
Georgescu-Roegen, 1977	The term bioeconomics is intended to make us bear in mind continuously the biological origin of the economic process and thus spotlight the problem of mankind's existence with a limited store of accessible resources unevenly located and unequally appropriated.
Tullock, 1979	The application of standard economic theory, and its behavioural assumption that individuals are constrained maximizers, in studying biological phenomena.
Magee, 1993	Bioeconomics is a one-factor theory based on hierarchy, which can explain both economics and politics. In bioeconomics, the strong dominate the weak in economic, political and social life.
Landa and Ghiselin, 1999	Bioeconomics aims at the integration or "consilience" of two disciplines, economics and biology for the purpose of enriching both disciplines by substantially enlarging the theoretical and empirical bases which ultimately contribute to building of new hypotheses, theorems, theories and paradigms.
Witt, 1999	The research paradigm combining two independent, though in many respects related, scientific disciplines: economics and biology.
Ghiselin, 2005	The field that uses an expanded microeconomics to examine animal behaviour, human behaviour, and animal and human social institutions.
Vromen, 2007	Bioeconomics concentrates on the significance of past evolutionary processes for studying current behaviour.
Gallagher, 2008	Bioeconomics refers to political economy's concentration on the interconnections among populations, the food supply, modes of production and exchange, and their impact on life forms generally.
Khalil and Marciano, 2010	The principle of rationality applied to non-human organisms.
Current authors	Transfer of biological approach to the human economy and economic approach to the behaviour of non-human organisms.

Source: authors' construction based on the review of literature

As literature review shows, comparison between economy and biology is made either by relating economic firms to individual plants or animals, or economic industries to species (Hirshleifer, 1977; Landa and Ghiselin, 1999), or else entire species to firms (Crocker and Tschirhart, 1992). Table 2 presents some

similarities between ideas and approaches applied by economists and biologists. Evolution, selection, cooperation, competition over scarce resources, behaviour optimisation, labour division, signalling, territorialism and migration are examples of the issues common to the economy of nature and the human economy.

Table 2

Analogies between economics and biology

Economics	Biology
The tragedy of the commons Concepts: externalities, cheating, punishment, common pool resources, public goods, free riding. Solutions: establishing private property, taxes, tradable permits, quotas, social pressure, punishment, government regulation	The tragedy of the commons Concepts: cheating, punishment, collapsing tragedy, component tragedy, social goods Solutions: kin (group) selection, punishment, "parliament of the genes"
Rational choice theory, consumer utility maximization, profit maximizing firm	Optimal foraging behaviour of animals, fitness and net energy maximization
Scarcity of resources, "no free lunch" principle, trade off, alternative costs	The law of compensation or balanced growth (to spend on one side, nature is forced to economise on the other side"
Kin-related behaviour and family life, optimal investments, optimal growth, dynamic optimization	Optimal life history strategies, reproduction value, dynamic optimization
Market signals, signalling costs, market screening, asymmetry of information	Handicap principle, animal's signalling and communication
Cooperation, the logic of collective action, human altruism and reciprocity	Animal collective behaviour, biological altruism
Game theory and interaction of strategically behaving actors	Evolutionary game theory: animals, trees, genes

Source: authors' construction based on the review of literature

The tragedy of the commons is one of those phenomena that are of the core concern for both economists and biologists. William Forster Lloyd (1832) was perhaps the first economist who introduced the concept of "the overuse of a common by its commoners" (those with rights to access and use it), which was later developed by an American ecologist Garrett Hardin and termed "the tragedy of the commons". Hardin (1968) describes it as follows: "Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest. We may well call it 'the tragedy of the commons', using the word

'tragedy' as the philosopher Whitehead used it: 'The essence of dramatic tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things' ".

Another example is "market signalling", the phrase and theory formulated by a co-recipient of the 2001 Nobel Prize in Economics Andrew Michael Spence (1973, 1974), reflecting the activities of individuals which are visible to somebody else and convey information in a market – a concept similar to "handicap principle" developed by a biologist Amotz Zahavi (1975, 1977).

2. Interactions between biology and economics – a historical perspective

The natural sciences (including biology) have interacted with social sciences (including economics) for a long time, and there is reason to believe that they would continue to do so. Below, the authors provide a historical account of the scientists and thinkers who have recognized the importance of biology for economics, and vice versa.

The ancient Greek philosopher and scientist Aristotle, who in his *Metaphysics Book Zeta* (Lewis, 2013) defines man as the rational animal, acknowledges both the continuity of humans with the rest of biological world and a clear qualitative distinction that sets human beings apart from it. According to him, "animal is universal to the species, man and horse, just in case (and only because) animal is contained in both man and horse". Additionally, Aristotle as a biologist applied scientific method to analyze political institutions (city-state and political rule), and affirmed the biological uniqueness of human political behaviour with his famous saying "man is, by nature, a political animal" (Aristotle, 350 BCE). Biology formed Aristotle's view of human happiness, the good life and telos (goal or end).

In 1705, Bernard Mandeville, an Anglo-Dutch philosopher and political economist, in his pamphlet entitled "The Grumbling Hive: or, Knaves Turn'd Honest"¹ found inspiration for economics in the complex order of the social insects (bees), presented as a metaphor for human society. In this work, which is regarded as a founding document of laissez-faire economic theory, he gives an analysis of how private vices result in increased public benefits.

According to a German writer, scientist and statesman Johann Wolfgang von Goethe, nature is perfect economy. The discipline he created in order to illustrate this was morphology. The

perfect economy was represented by natural budgets: "(...) *economical nature has prescribed a budget in which the main sum remains the same, for if too much has been given (expanded) on one side, it subtracts it from the other side and balances it out in no uncertain manner*" (Goethe, 1795). In other words, "*the budget of nature is fixed; but she is free to dispose of particular sums by an appropriation that may please her*" (Saint-Hilaire, 1818).

Adam Smith referred to the "economy of nature" in his "*Theory of Moral Sentiments*" (1759). Thomas Malthus (1789) borrowed from nature "*the laws of natural increase in the animal and vegetable kingdoms*" and noticed that taking the whole earth "*Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio*". Malthus' bioeconomics of population dealt with the issues of human survival: life and death.

The expression "economy of nature" was repeatedly used by a biologist Charles Darwin (influenced by Smith's economic writings) in his "*The Origin of Species*" (1859) and other publications. Darwin received some useful ideas for developing the theory of natural selection from Malthus' population principle. Darwin's theory of descent provides a general mechanism (i.e. natural selection) explaining the diversity and adaptiveness of living beings: "*All organic beings are striving to seize on each place in the economy of nature*", and "*natural selection is continually trying to economise every part of the organization*" (Darwin, 1859). He was one of the first scientists to suggest an explicit similarity between natural and political economy. With him, the economy of nature started to be understood with conceptual tools taken from political economy. The work division, resource scarcity, competition (struggle for existence), trading, an accumulation of innovations and the geometric population growth are ideas borrowed from Smith, Malthus and other founders of modern economics. The Darwin's theories indicate that

¹ Subsequent expanded version appeared under the title "The Fable of the Bees: or Private Vices, Publick Benefits" (Mandeville, 1714).

metaphors from economics have had crucial effect on the development of biology.

Alfred Marshall, one of the founders of neoclassical economics, turned to the biological evolution for inspiration in his *"Principles of Economics"* (Marshall, 1890). He believed that economic systems evolved akin to biological ones and that maximizing behaviour was prevalent due to the selection and survival of profit or utility maximizers (*"survival of the fittest"*) or since *"the natural selection of the strongest characters for a life of adventure"*.

Also Thorstein Veblen, a founder of old institutional economics, thought that social science had to be linked with biology (Jennings and Waller, 1998). According to him, *"It may be taken as the consensus of those men who are doing the serious work of modern anthropology, ethnology, and psychology, as well as of those in the biological sciences proper, that economics is helplessly behind the times, and unable to handle its subject matter in a way to entitle it to standing as a modern science"* (Veblen, 1898). He himself applied Darwinian ideas, namely principles of selection and inheritance as well as the principles of causality, in order to analyse socio-economic evolution. In the book entitled *"The Leisure Class"* he wrote: *"Institutions are products of the past process, are adapted to past circumstances, and are therefore never in full accord with the requirements of the present"* (Veblen, 1899).

According to Landa and Ghiselin (1999), modern bioeconomics with the rational choice emphasis emerged in the early 1970s and originates from the pioneering works of the public choice theorists: Gordon Tullock (1971) and Gary Becker (1976), a political economist Jack Hirshleifer (1977) and a biologist Michael Ghiselin (1978). It must be admitted, however, that before them influential Chicago School economists like Armen Alchian (1950) and Milton Friedman (1953) had proposed approach embodying the principles of biological evolution

and natural selection to interpret economic systems (including market) as an adoptive mechanism. Alchian's view is that neither profit nor utility maximisation but the criterion of *"realised positive profits"* guides the choice of action by economic agents and marks the success and viability. *"This is the criterion by which economic system selects survivors: those who realise positive profits are the survivors; those who suffer losses disappear"* (Alchian, 1950).

Gordon Tullock in his book *"The Economics of Non-Human Societies"* (1994) developed a general theory of society encompassing both human and non-human societies. In his analysis of non-human species, he applies the tools that have evolved in economics to explain human behaviour. Specifically, he raises the question of how the activities of the individual organism are coordinated in non-human economies. Answering, he says that each organism is programmed according to a preference function similar to the utility function postulated by the economists for human beings. Tullock's research on trust (1967) also contributed to bioeconomics, and thus, to the later development of neuroeconomics² viewed by some researchers as a natural extension of bioeconomics.

Summing up the literature review, it might be said that a research field called bioeconomics focuses chiefly on: (1) the significance of past evolutionary processes for studying current human behaviour; (2) the application of economic concepts and principles (such as competition, cooperation, specialization etc.) in studying biological phenomena, and (3) the incorporation of insights from biology (mainly evolutionary biology) into economic theory. On the one hand, some researchers (e.g. Tullock and Ghiselin) emphasize on what biology can learn from economics, admitting that there has been a

² The field of neuroeconomics seeks to discover the biological foundations of economic choice behaviour by investigating how current behaviour (decision making) is caused by ongoing brain processes.

persistent transfer of ideas and techniques from economics to biology but not believing (specially Tullock) that it is possible to learn much about human society from animal society. On the other hand, the others (e.g. Becker and Hirshleifer) argue that economics and biology can be mutually valuable; economics can accommodate insights from biology (mainly from evolutionary biology).

3. What is the bioeconomy?

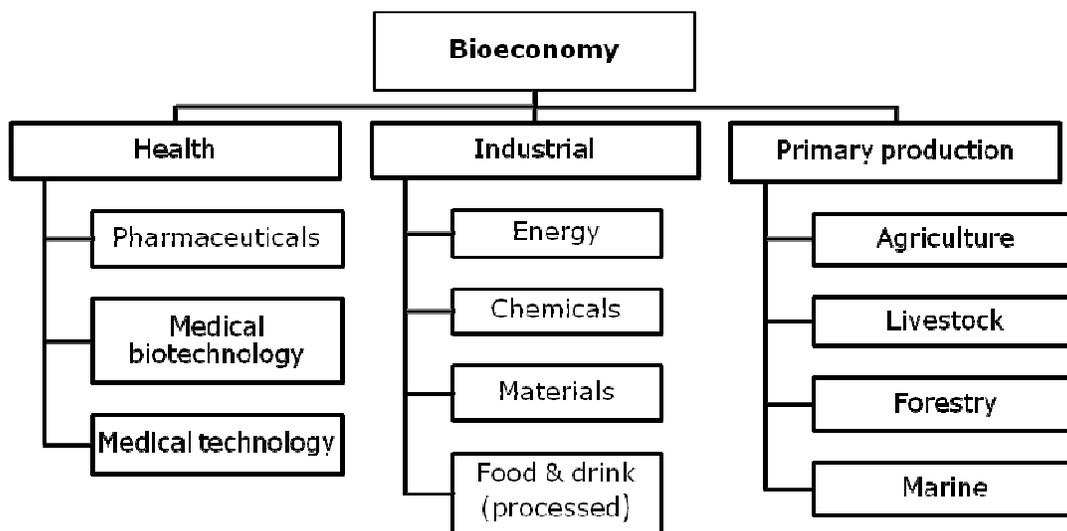
Bioeconomy is an emerging concept which probably goes back to the OECD report (2001)

Table 3

Selected definitions of bioeconomics

Authors	Definitions
OECD, 2009	The set of economic activities relating to the invention, development, production and use of biological products and processes.
The White House, 2012	Economic activity that is fuelled by research and innovation in the biological sciences.
European Commission, 2012	Encompassed production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy.
McCormick and Kautto, 2013	An economy where the basic building blocks for materials, chemicals and energy are derived from renewable biological resources.

Source: authors' construction based on literature review



Source: authors' construction based on Guy (2012)

Fig. 1. Sectors of bioeconomy

The study finds out that the definitions of the bioeconomy (more or less precise) differ depending on the source but display similarities such as an emphasis on economic activities (e.g.

production), a broad cross-sectoral and institutional focus as well as admitting the impact or role of technologies and knowledge derived from the biological sciences (Table 3).

The bioeconomy generally relies on life sciences, agronomy, ecology, food science, social sciences, biotechnology, nanotechnology, information and communication technologies, and engineering (EC, 2012). It includes primary production (of which the agriculture has a major role to play), industrial sector as well as health sector (Figure 1).

Conclusions and recommendations

- 1) Overall, the conclusions of this study are as follows.
- 2) Bioeconomics as a research and academic discipline can be interpreted at least in two ways: (1) as a vehicle for the adoption by the biological research community of ideas, approaches, concepts and tools (such as rational choice behaviour, maximization/minimisation under constraints, etc.) developed by the economists of different schools; (2) transporting analytical tools and

concepts developed in the biological sciences (particularly in the Darwinian evolutionary theory) into economic theory and practical research.

- 3) The terms bioeconomics and bioeconomy are not synonymous. The bioeconomy, as a set of specific economic activities and political project, can, however, borrow some insights from bioeconomics.
- 4) The perspectives and frameworks offered by bioeconomics give the opportunities for creative and novel interdisciplinary discourse between economic sciences and life sciences but also imply establishing closer, collaborative relations between them. In order to advance this field of research and academic discipline, economists and biologists need to work better together, while universities should offer students curriculum that incorporates economic subjects and biological subjects.

Bibliography

1. Alchian, A.A. (1950). Uncertainty, Evolution, and Economic Theory. *The Journal of Political Economy*, Volume 58, Issue 3, pp. 211-221.
2. Aristotle (BC 350). *The Politics*, Book I, Chapter 2. p. 1253. (translated by Sinclair T.A., London: Penguin Classic, 1981, p. 512).
3. Axelrod, R. (2008). *Political Science and Beyond: Presidential Address to the American Political Science Association. Perspectives on Politics*, Volume 6, Issue 1, pp. 3-9.
4. Becker, G.S. (1976). Altruism, Egoism, and Genetic Fitness: Economics and Sociobiology. *Journal of Economic Literature*, Volume 14, Issue 3, pp. 817-826.
5. Crocker, T.D., Tschirhart, J. (1992). Ecosystems, Externalities, and Economies. *Environmental and Resource Economics*, Volume 2, Issue 6, pp. 551-567.
6. Darwin, C.R. (1859). *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. London: John Murray. p.502.
7. European Commission (2012). *Innovating for Sustainable Growth: A Bioeconomy for Europe*, Luxembourg: Publications Office of the European Union. p. 60.
8. Friedman, M. (1953). *The Methodology of Positive Economics*. In: Friedman, M.: *Essays in Positive Economics*, Chicago: University of Chicago Press. p. 334.
9. Gallagher, K. (2008). *The Body Economic. Life, Death, and Sensation in Political Economy and the Victorian Novel*. Princeton and Oxford: Princeton University Press. p. 209.
10. Georgescu-Roegen, N. (1977). Inequality, Limits and Growth from a Bioeconomic Viewpoint. *Review of Social Economy*, Volume XXXV, Issue 3, pp. 361-375.
11. Ghiselin, M. (1978). The Economy of the Body. *American Economic Review*, Volume 68, Issue 2, pp. 233-237.
12. Ghiselin, M. (2005). Comment on Robert Yarbrough's 'Teaching Bioeconomics'. *Journal of Bioeconomics*, Volume 7, Issue 1, pp. 39-40.
13. Goethe, J.W. von (1795). *Erster Entwurf einer allgemeinen Einleitung in die vergleichende Anatomie, ausgehend von der Osteologie (First Outline of a General Introduction to Comparative Anatomy Starting from Osteology)*. In: Johann Wolfgang von Goethe (1977). *Schriften zur Naturwissenschaft (Auswahl)*. Stuttgart: Reclam. p. 309.
14. Guy, K. (2012). *Skills and the Bioeconomy*. Presentation at Conference "New Skills for a European Bioeconomy". European Commission, Brussels, 20-21 November, 2012. Retrieved: http://www.powershow.com/view2a/402f8b-MzM4M/Skills_and_the_bioeconomy_powerpoint_ppt_presentation. Access: 16.10.2015.
15. Hardin, G. (1968). The Tragedy of the Commons. *Science*, Volume 162, Issue 3859, pp. 1243-1248.
16. Hirschleifer J. (1977). Economics from a Biological Viewpoint. *Journal of Law and Economics*, Volume 20, Issue 1, pp. 1-52.

17. Jennings, A., Waller, W. (1998). The Place of Biological Science in Veblen's Economics. *History of Political Economy*, Volume 30, Issue 2, pp. 189-217.
18. Khalil, E.L., Marciano, A. (2010). The Equivalence of Neo-Darwinism and Walrasian Equilibrium: in Defense of Organismus Economicus. *Biology and Philosophy*, Volume 25, Issue 2, pp. 229-248.
19. Landa, J.T., Ghiselin, M.H. (1999). The Emerging Discipline of Bioeconomics: Aims and Scope of the Journal of Bioeconomics. *Journal of Bioeconomics*, Volume 1, Issue 1, pp. 5-12.
20. Lewis, F.A. (2013). *How Aristotle Gets by in Metaphysics Zeta*. Oxford Aristotle Studies Series, Oxford: Oxford University Press. p. 352.
21. Lloyd, W.F. (1832). *Two Lectures on the Checks to Population: Delivered before the University of Oxford, in Michaelmas Term 1832*. London: Oxford. p. 75.
22. Magee, S.P. (1993). Bioeconomics and the Survival Model: The Economic Lessons of Evolutionary Biology. *Public Choice*, Volume 77, Issue 1, pp. 117-132.
23. Malthus, T. (1798). *An Essay on the Principle of Population*. London: J. Johnson, in St. Paul's church-yard.
24. Mandeville, B. (1705). *The Grumbling Hive: or, Knaves Turn'd Honest*. London: Sam. Ballard and A. Baldwin.
25. Mandeville, B. (1714). *The Fable of the Bees: or, Private Vices, Publick Benefits*. London: J. Roberts.
26. Marshall, A. (1890). *Principles of Economics*. London: Macmillan and Co. p. 627.
27. McCormick, Kautto, N. (2013). The Bioeconomy in Europe: An Overview. *Sustainability*, Volume 5, Issue 6, pp. 2589-2608.
28. National Academies of Science (2004). *Committee on Facilitating Interdisciplinary Research*. Washington, DC: National Academies Press.
29. OECD (2001). *The Application of Biotechnology to Industrial sustainability; A Primer*. Retrieved: <http://www.oecd.org/dataoecd/61/13/1947629.pdf>. Access: 6.12.2016.
30. OECD (2009). *The Bioeconomy to 2030: Designing a Policy Agenda*. International Futures Programme. p. 322.
31. Popper, K.R. (1963). *Conjectures and Refutations: The Growth of Scientific Knowledge*. New York: Routledge and Kegan Paul. p. 412.
32. Reinheimer, H. (1913). *Evolution by Co-operation: A Study in Bio-economics*. London: Kegan Paul, Trench, Trubner and Co., p. 200.
33. Saint-Hilaire, E.G. (1818). *Philosophie Anatomique*, Vol. 2. Paris: J.B. Bailliere. p. 566.
34. Smith, A. (1759/2011). *Theory of Moral Sentiments*. New York: Gutenberg Publishers, p. 358.
35. Smith, A. (1776/1904). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Edwin Cannan Edition, London: Methuen & Co., Ltd.
36. Spence, A.M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, Volume 87, Issue 3, pp. 355-374.
37. Spence, A.M. (1974). *Market Signaling. Informational Transfer in Hiring and Related Screening Processes*. Cambridge, MA: Harvard University Press. p. 224.
38. Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, Volume 87, Issue 3, pp. 355-374.
39. The White House (2012). *National Bioeconomy Blueprint*, Washington.
40. Tullock, G. (1967). The Prisoner's Dilemma and Mutual Trust. *Ethics*, Volume 77, Issue 3, pp. 229-230.
41. Tullock, G. (1971). The Coal Tit as a Careful Shopper. *The American Naturalist*, Volume 105, Issue 941, pp. 77-80.
42. Tullock, G. (1979). Sociobiology and Economics. *Atlantic Economic Journal*, Volume VIII, Issue 3, pp. 1-10.
43. Tullock, G. (1994). *The Economics of Non-Human Societies*. Tucson: Pallas Press. p. 87.
44. Veblen, T.B. (1898). Why is Economics Not an Evolutionary Science? *Quarterly Journal of Economics*, Volume 12, Issue 4, pp. 373-397.
45. Veblen, T.B. (1899). *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions*. New York: Macmillan.
46. Vromen, J.J. (2007). Neuroeconomics as a Natural Extension of Bioeconomics: The Shifting Scope of Standard Economic Theory. *Journal of Bioeconomics*, Volume 9, Issue 2, pp. 145-167.
47. Witt, U. (1999). Bioeconomics as Economics from a Darwinian Perspective. *Journal of Bioeconomics*. Volume 1, Issue 1, pp. 19-34.
48. Zahavi A. (1977). The Cost of Honesty (Further Remarks on the Handicap Principle). *Journal of Theoretical Biology*, Volume 67, Issue 3, pp. 603-605.
49. Zahavi, A. (1975). Mate Selection – A Selection for a Handicap. *Journal of Theoretical Biology*, Volume 53, Issue 1, pp. 205-214.

BIOECONOMY AS A DIRECTION OF THE DEVELOPMENT OF NATURAL VALUABLE AREAS IN LUBLIN VOIVODESHIP (POLAND)

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Abstract. The aim of the study is to indicate the main factors and barriers to the development of the enterprises which represent the bioeconomy sector and operate in valuable natural areas. Taking into consideration that the bioeconomy is a key and a potential sector, which should be developed in the environmentally valuable areas, the study identifies the most important factors for the development of the studied sector and desirable forms of supporting that activity. The paper presents the results of the research on a sample of 48 enterprises representing the bioeconomy sector located in 30 municipalities with the highest environmental valuables in Lublin voivodeship (Poland). The study shows that entrepreneurs who represent the bioeconomy sector perceived local ecological conditions as a key and a positive factor of company's development. The results are presented in a form of selected elements of descriptive statistics. The paper was prepared within the research project No 2011/01/D/HS4/03927 entitled "Environmental Conditions and Factors of Development of the Economic Functions of Valuable Natural Areas of Lublin Voivodeship" funded by the National Science Centre.

Keywords: bioeconomy, natural resources, regional policy

JEL code: Q01, Q56, R11

Introduction

Lublin Voivodeship is a peripheral region. It results, among others, from such reasons as geographical location or economic and socio-demographic criteria (Miszczuk A., 2013). Due to its peripherality, this region demonstrates the existence of many development barriers, including economic, social, demographic and infrastructural ones. Generally, unfavourable situation in terms of development conditions makes local and regional authorities look for innovative directions of the regional development. These directions should stimulate development processes of the region on the basis of more comprehensive use of internal resources of the region as well as external factors of the development. Such approach to regional development policy is compatible with the concept of neo-endogenous development.

An important element of the concept of neo-endogenous development is the assertion that the socio-economic welfare can be achieved by restructuring public intervention. It is important to move away from policies focused on sectors and to develop policies oriented territorially (Ray Ch., 2006). The essence of neo-endogenous approach is the simultaneous involvement of various local entities that fulfil key functions to

stimulate and coordinate local development processes. There is also a necessity of involvement of external institutions supporting bottom-up development processes (Michalewska-Pawlak M., 2013).

The studied region is located in the Central-Eastern part of Poland, bordering with Ukraine and Belarus. In the region, there are important communication routes linking Western Europe with those countries. Lublin Voivodeship is one of the least developed, peripheral regions of Poland and the European Union. This condition is affected by a set of many interrelated negative development conditions. It is an agricultural region. It is evidenced by a significant share of the primary sector of economy in the structure of regional gross value added (6.16 % in 2013) and its important role in creating jobs (38.5 % of employees in 2013). Disadvantageous situation of the regional economy in comparison with the country is determined structurally, primarily because of the two phenomena. First of them is a significant share of agriculture in the regional economy, and the second one is low labour productivity in this sector. At the same time, the region is one of the least populated and urbanized regions in Poland. The demographic

situation is unfavourable and is steadily declining as a result of a low number of births and migration outflow (Strategia rozwoju..., 2014, Rocznik Statystyczny..., 2015). The region is attractive in terms of natural and landscape values. In Lublin Voivodeship, resources and values of natural environment could play an important role in the development processes of the region. In Lublin Voivodeship, like in other peripheral regions, natural resources are an important but not fully exploited source of socio-economic development.

The concept of smart specialization gives new insights into the development processes, which can be used in the case of regions with a lower level and dynamics of development processes. Smart specialisation is an industrial and innovation framework for regional economies that aims to illustrate how public policies, framework conditions but especially R&D and innovation investment policies can influence economic, scientific and technological specialisation of a region and consequently its productivity, competitiveness and economic growth path (Innovation-driven growth..., 2013). The instruments of the concept of smart specialization are Regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). RIS3 strategies focus policy support and investments on key regional priorities, challenges and needs for knowledge-based development and are built on each region's strengths, competitive advantages and potential for excellence. Their priority is to get the stakeholders fully involved and to encourage innovation and experimentation. RIS3 are the elements of the EU Cohesion Policy investment for 2014-2020 and a tool of Europe 2020 growth strategy (National/regional innovation strategies..., 2014).

The basic assumption of the concept of smart specialization is to increase innovativeness and competitiveness of the regions on the basis of their endogenous potential and sectors already operating in them. Specific resources of the

region determine the uniqueness of the regional space and should be seen as the basis for endogenous development. Smart specialization also fits in with the concept of economic development associated with the promotion of natural products or nature handicrafts (Slodowa-Helpa M., 2013).

The bioeconomy sector creates large capacity to implement smart specialization in the peripheral regions. These regions usually have a significant natural potential, not deeply transformed by the anthropogenic pressure. This potential can be used for the development of both traditional and highly innovative industries utilizing natural resources.

The bioeconomy sector is an essential part of natural valuable areas economies. Its development can become an important factor for sustainable development of these areas. However, it is imperative to provide sustainable management of natural valuable areas' resources. It should also be indicated that the process of creating economic value based on the use of environmental resources must incorporate knowledge and innovation (Pessoa A., Rui Silva M., 2009). It must be stressed also that valuable natural areas can create favourable conditions for the development of this sector offering the availability of valuable natural resources. Their use depends on the activity and innovativeness of enterprises and support provided by local authorities. Local natural heritage may constitute the basis for the formation of the cooperation of local entities in the planning and implementation of local strategies for sustainable development. Proposals of innovative directions for using local natural resources and values in the processes of local development should constitute the core of these strategies.

The bioeconomy encompasses the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed,

bio-based products and bioenergy. The bioeconomy includes the sectors of agriculture, forestry, fishery, food and pulp and paper production as well as parts of chemical, biotechnological and energy industries. Its sectors and industries have strong innovation potential due to their use of a wide range of sciences (Communication from the Commission..., 2012). In a broader sense, the concept of the bio-economy includes practically all sectors and related services that produce, process or use biological resources in any form. Their rational use can be a significant source of value creation in activities of enterprises, especially micro and small ones (Chylek E., Rzepecka M., 2011).

It should be noticed that the bioeconomy in "Lubelskie Regional Innovation Strategy till 2020" was chosen as the key, smart specialization of the region (Janczarek P., 2013). Due to that it is justified to conduct studies on the developmental determinants of the bioeconomy sector in Lublin Voivodeship. It is particularly important to recognize conditions for the development of the bioeconomy sector offered by valuable natural areas.

The aim of the study is thus to indicate the main factors and barriers to the development of the enterprises which represent the bioeconomy sector operating in valuable natural areas. Taking into consideration that the bioeconomy is a key and a potential sector, which should be developed in the environmentally valuable areas, the study identifies the most important factors for the development of the studied sector and desirable forms of supporting that activity.

The study verifies the hypothesis that in the case of enterprises located in natural valuable areas and representing the bioeconomy sector local environmental determinants create a key and a positive factor of their development. The surveyed enterprises, which are located in a peripheral region, recognise many external barriers created by the environment of their activity but the ecological sphere is perceived

positively – as a factor in enterprises' development. Barriers perceived by the entrepreneurs generate the need to support the enterprises. The need to support this sector by local authorities as well as the need for wider inclusion of these entities into local processes of sustainable development can be observed in the surveyed areas.

The study area consisted of 30 municipalities with the highest environmental valuables in Lublin voivodeship, designated under the synthetic index developed by D. Guzal-Dec (2013) in the study of ecologically valuable rural and semi-urban areas of Lublin voivodeship. In each of the communes, on the basis of the REGON number, 5 enterprises located in rural areas were selected for testing, and the sample reflected the sectoral structure of business entities in the commune and the highest level of employment. Diagnostic survey was applied using a questionnaire interview. Interviews with owners (or managers) of enterprises were carried out in the period of November-December, 2013. The research material consisted of 150 questionnaire interviews. From the group of 150 enterprises, 48 were selected to represent entities of the bioeconomy sector on the basis of the resource criterion which included all entities of production area that use biological resources. The results are presented in a form of selected elements of descriptive statistics and graphic form using tables and graphs. The report was prepared as part of the research project No 2011/01/D/HS4/03927 entitled: "Environmental Conditions and Factors of Development of the Economic Functions of Valuable Natural Areas of Lublin Voivodeship" funded by the National Science Centre.

Research results and discussion

1. Characteristics of the enterprises in the bioeconomy sector

Enterprises in the bioeconomy sector are characterized by a relatively long market

presence and most of them were established in the first years of transition. More than half of the entities - 56.3% were established in the period from 1990 to 2000, 31.3 % of them between 2001 and 2012, and 10.3 % after the year 2012. With respect to the staff headcount criterion of the analysed entities, the sample consisted mostly of microenterprises (64.6%). The share of small enterprises amounted to 20.8 % and medium ones to 14.6 %.

All of the analysed enterprises represented the private sector. More than half (52.1 %) of the enterprises had the status of a family business. The most frequently represented bioeconomy sector was manufacturing, including food and wood industry (they accounted for 27.1 % and 25.0 % of the sample respectively). A slightly smaller share of the sample (41.7 %) was recorded in the first sector of the economy, which included such industries as agriculture, forestry, hunting and fishing. Other entities represented the energy production sector (2.1 %) and others (4.1 %).

Most of the enterprises in the bioeconomy sector gained and maintained its supra-local market shares. Regional markets were served by 16.7% of enterprises, whereas domestic and foreign markets by 54.2% of entities. The economic and financial situation of the organization was assessed as good and very good by the vast majority of entrepreneurs (64.6%). That group also declared that the company had developed its business activities for the last three years.

2. Factors and barriers affecting the development of enterprises

In the light of the study, it can be concluded that entrepreneurs recognize the complexity of conditions for the development of economic activities. A large group of them (39.6 %) perceived numerous factors as well as barriers that affect business development. A fairly large group (25.0 %) could not see either factors or barriers. Development factors were perceived by a much larger group than development barriers (22.9 % and 12.5 %, respectively) (Table 1).

Table 1

Number and percentage of entrepreneurs perceiving the existence of situations identified by specific combination of factors and barriers of development

Situation	Factors	Barriers	Number of indications	
			number	percentage
1.	+	+	19	39.6
2.	-	-	12	25.0
3.	+	-	11	22.9
4.	-	+	6	12.5
5.	Total		48	100.0

Source: author's calculations based on empirical research

In open-ended questionnaires about factors stimulating the development of the enterprises, entrepreneurs primarily pointed out those embedded in the external environment of the organization. The most important were: availability of local resources, dynamic development of the market and advantageous geographic location specified by the availability of

transport routes and proximity to urban centres. The most frequently indicated internal conditions favouring the development of the organizations were: lasting relationships with customers, company reputation, high quality of products, experience in the business. Therefore, it could be concluded that ecological considerations are

Table 2

Factors affecting the development of economic activities perceived by the surveyed entrepreneurs

No	Factors	Number of indications	
		number	percentage
1.	Location - the availability of local resources	11	25.0
2.	Dynamic development of the market	8	18.2
3.	Lasting relationships with customers	4	9.1
4.	Location - transport accessibility, proximity to urban centres	3	6.8
5.	Company reputation	3	6.8
6.	High quality of products	3	6.8
7.	Experience in the business	3	6.8
8.	Low intensity of competition	3	6.8
9.	Availability of EU funds	2	4.5
10.	Others	4	9.1
11.	Total	44	100.0

Source: author's calculations based on empirical research

A strong market competition was indicated by the entrepreneurs as one of the main barriers to economic activities. This barrier should be associated with a high dynamics of the market development, as perceived by the entrepreneurs. Other, less frequently perceived barriers were: high costs of economic activities, difficulties arising from legal provisions on economic activities and insufficient level of the development of technical infrastructure.

The respondents indicated fewer barriers than drivers of economic activities. It can be stated that most of these barriers did not concern a regional business environment. Such barriers as unsatisfactory state of the development of technical infrastructure and a low demand were mainly pointed out among regional barriers while a peripheral character of the region and the requirements of environmental protection were less frequently pointed out among the listed barriers (Table 3).

Barriers affecting development of economic activities perceived by the surveyed entrepreneurs

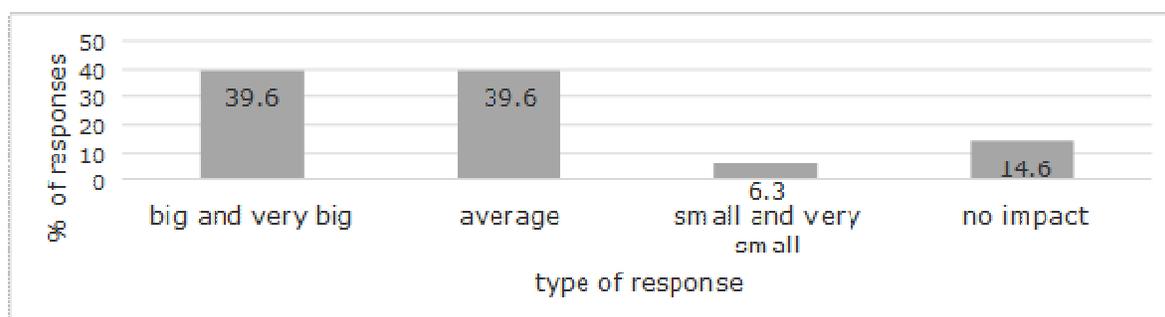
No.	Barriers	Number of indications	
		number	percentage
1.	Intense competition	9	24.3
2.	High cost of economic activity, high investment costs	5	13.5
3.	Complicated and frequently changing legal provisions on economic activity	4	10.8
4.	Poor provision of infrastructure	4	10.8
5.	A high level of fiscal burdens	3	8.1
6.	Insufficient demand	3	8.1
7.	Unfavourable agricultural policy, the situation in the agricultural markets	2	5.4
8.	Peripheral location of the region	2	5.4
9.	Standards and requirements of environmental protection	2	5.4
10.	Others	3	8.1
11.	Total	37	100.0

Source: author's calculations based on empirical research

Taking into account the issues of local conditions of entrepreneurship in natural valuable areas, it should be noted that a large group of entrepreneurs estimated (60.4 %) that the commune offers favourable conditions for the functioning and development of enterprises. Quite a large group (33.3 %) of the respondents could not assess local conditions, while only a few (6.3 %) considered them as negative. Such assessments may arise inter alia from the fact that almost half of the respondents (48.9 %) declared using variety of opportunities to run and

develop economic activity arising from the location in the commune with the high environmental valuables.

Resources and values of the natural environment turned out to be an important element of the business environment affecting on-going activity of the enterprises. The majority (79.2 %) of the representatives of these entities assessed the impact of the natural environment on the company as ranging from very large to medium (Figure 1).



Source: author's calculations based on empirical research

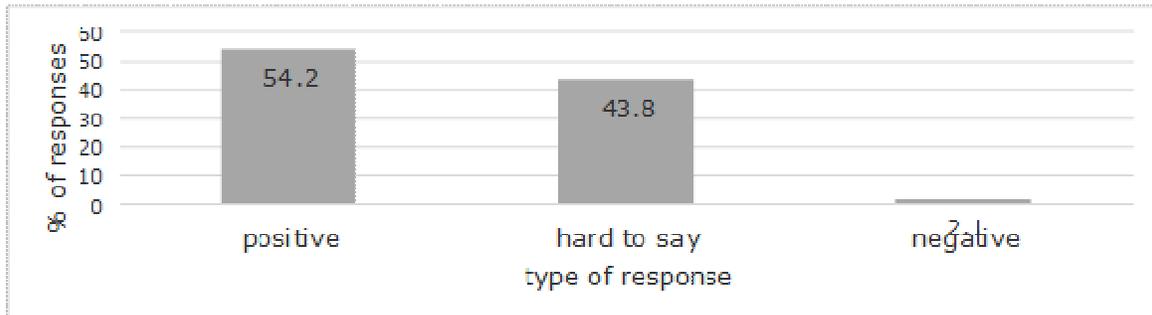
Fig. 1. Assessment of the impact of environmental forces of the commune on the on-going activities of the enterprise by the surveyed entrepreneurs (% of responses)

Not only did the surveyed entrepreneurs perceive a rather strong impact of resources and

values of natural environment of the commune on the on-going activity of the enterprise but

they also assessed it as positive. More than half (54.2 %) of the surveyed entrepreneurs stated that the natural environment of the commune

has a positive impact on the current activity of the enterprise (Figure 2).



Source: author's calculations based on empirical research

Fig. 2. **Assessment of the environmental impact of municipalities on the on-going activities of the enterprise according to the surveyed enterprises (% of responses)**

Factors of the development of enterprises and desirable forms of support

Entrepreneurs saw the biggest opportunities for strengthening their competitive position in the characteristics of enterprise's products and services. In the respondents' opinion, particularly important elements of product characteristics with the competing potential were: innovativeness, meeting customers' requirements, high quality and competitive price. The possibility of strengthening the competitive position in the field of good knowledge of the market, specialized knowledge and skills, and lasting relationships with customers were

assessed by the respondents as above average. Opportunities to strengthen the competitive position of enterprises in the dimension of ecological conditions were assessed by the surveyed entrepreneurs at an average level (but at a lower level than the above-mentioned factors). These factors included enterprises' location in natural valuable areas and pro-ecological activities. Slightly more important, in the opinion of entrepreneurs, was their knowledge of how to seize opportunities and adapt to the limitations resulting from the operation in environmentally valuable areas (Table 4).

Assessment of the selected factors in terms of offering possibilities to strengthen enterprise's competitive position, assessment made on a scale of 1-5, where 1 is a non-significant and 5 - very important

No.	Factors	\bar{x}	S
1.	Quality of products / services	4.2	0.61
2.	Good knowledge of the market	4.1	0.55
3.	Ability to adjust production / services to customer requirements	4.0	0.52
4.	Lasting relationships with customers	4.0	0.59
5.	Price of products / services	4.0	0.62
6.	Innovative products / services	3.9	0.85
7.	Specialized knowledge and skills	3.7	0.73
8.	Knowledge of how to seize opportunities and adapt to the limitations resulting from the operation on environmentally valuable areas	3.5	0.89
9.	Company's location on natural valuable areas	3.1	1.06
10.	Pro-ecological activity	3.0	1.33

Source: author's calculations based on empirical research

It should also be noted that such factors as functioning in a group of enterprises with similar objectives to ensure co-operation and transfer of knowledge ($\bar{x}=3.3$, $s=0.93$) and institutional support ($\bar{x}=3.3$, $s=0.78$) were not assessed as significant factors affecting the success of enterprises basing their activities on the use of natural resources.

Generally, it can be stated that the surveyed entrepreneurs rated their needs for selected forms of business support at an average level. Entrepreneurs reported the need to provide better access to external financing sources and information, including raising funds for the development of the enterprise and market information. The importance of support in terms of the promotion of valuable natural areas of the region, adapting the profile of the enterprise to the requirements of protected areas or conducting business activity including marketing activities was also rated at an average level. Taking the specificity of the studied area into account, it is of concern that entrepreneurs manifested little interest in being supported in environment-friendly investments. These results may indicate the need for developing pro-

ecological attitudes in the studied group of entities (Table 5).

Local government authorities could play an important role in the development of the bioeconomy aimed at the implementation of local sustainable development. The possibility to implement activities in this area may include both actions taken in general in order to support entrepreneurship as well as those taking into account local pro-ecological conditions. According to the entrepreneurs' opinion, local government authorities present rather average activity in the areas which have been mentioned above. Entrepreneurs assessed¹ the activity in the studied area slightly above average in the case of the implementation of local policy of supporting entrepreneurship ($\bar{x}=3.2$, $s=0.72$), information concerning business ($\bar{x}=3.2$, $s=0.82$), providing information on preferred directions of development of entrepreneurship in the commune ($\bar{x}=3.2$, $s=0.82$). Government activities were also evaluated at an average level in the field of activities important from the point of view of sustainable development, including:

¹ assessment made on a scale of 0-5, where 0 is a lack of activity and 5 - very high level of activity

undertaking environmental initiatives with entrepreneurs ($\bar{x}=3.0$, $s=0.85$), supporting environmental projects of entrepreneurs ($\bar{x}=3.1$, $s=0.84$), indicating directions of economic activity contributing to conservation and the use of local economic resources ($\bar{x}=3.0$, $s=0.85$) and environmental education addressed to entrepreneurs ($\bar{x}=3.0$, $s=0.91$).

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Table 5

Assessment of the degree of demand for selected forms of support for entrepreneurs operating in environmentally valuable areas, assessment made on a scale of 0-5, where 0 is a non-significant and 5 - very important

No.	Forms of support	\bar{x}	S
1.	Better access to external sources of financing, of preferential credits and loans	2.9	1.44
2.	Access to information about markets, customers and partners to co-operate	2.7	1.23
3.	Advice on how to raise funds for the development of enterprises located in rural areas	2.7	1.34
4.	Greater promotion of valuable natural areas of the region	2.6	1.22
5.	Access to information about conducting business activity and investing	2.6	1.26
6.	Advice on product development and marketing plan	2.6	1.29
7.	Information on how to adapt the profile of the enterprise to the requirements of protected areas	2.5	1.31
8.	Support in preparing environment-friendly investments	2.2	1.32

Source: author's calculations based on empirical research

Conclusions

In terms of a better access to resources of knowledge and external sources of financing the economic activity, the study revealed a need for a greater support for entrepreneurs.

The findings reveal that the activity of local governments within the framework of actions which lead to the implementation of sustainable

development policies is noticeable. To strengthen a sustainable use of natural potential of natural valuable areas, local authorities should aim at intensifying the co-operation inside the local communities in this area and develop relationships with local entrepreneurs, farmers, NGOs. It should result in generating eco-innovation at a local level. Within a local

environmental policy actions aimed at a wider engagement of local enterprises in environmental initiatives should get a particular consideration. That direction of local development is in line with the concept of neo-endogenous development and the RIS3 strategies.

The opportunities to strengthen the competitive position of enterprises in using such factors as enterprise's location in natural valuable areas and pro-ecological activities were not seen as significant by the entrepreneurs. These

findings prompt to look for opportunities to pursue eco-innovation that will contribute to strengthening the competitive position of the enterprises as well as the local economy.

The results of the study entitle to state that the bioeconomy sector is a direction of economic development which corresponds to the specifics of the study area. However, its development requires taking a number of efforts at a local level seeking for an innovative and sustainable use of local environmental resources.

Bibliography

1. Chylek, E., Rzepecka, M. (2011). Biogospodarka – Konkurencyjność i Zrównoważone Wykorzystanie Zasobów (Bioeconomy – Competitiveness and the Sustainable Use of Resources), *Polish Journal of Agronomy*, 7, 2011, p. 9.
2. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Innovating for Sustainable Growth: A Bioeconomy for Europe*, European Commission, Brussels, 13.2.2012, pp. 3-4. Retrieved: http://ec.europa.eu/research/bioeconomy/pdf/201202_innovating_sustainable_growth_en.pdf. Access: 20.12.2015.
3. Guzal-Dec D. (2013). Operacjonalizacja Modelu Presja-Stan-Reakcja w Badaniu Cennosci Ekologicznej Gmin Wiejskich na Przykladzie Wojewodztwa Lubelskiego (Operationalization of the Model Pressure-State-Response in the Study of Ecological Preciousness of Rural Communes on the Example of the Lublin Voivodeship). *Rocznik Ochrony Srodowiska/Annual Set the Environment Protection*, Volume 15, Issue 3, pp. 2925-2941.
4. *Innovation-driven Growth in Regions. The Role of Smart Specialisation, Preliminary Version*. (2013). Paris: OECD, p. 17.
5. Janczarek, P. (2013). *Projekt Regionalnej Strategii Innowacji Wojewodztwa Lubelskiego do 2020 r. Inteligentne Specjalizacje (The Project of Regional Innovation Strategy of Lublin Voivodeship until 2020. Intelligent Specializations)*. Lublin: Departament Gospodarki i Innowacji Urzedu Marszalkowskiego w Lublinie (Department of Economy and Innovation of Marshal's Office in Lublin).
6. Michalewska-Pawlak, M. (2013). *Priorytety i Wyzwania Polityki Rozwoju Obszarow Wiejskich Unii Europejskiej (Priorities and Challenges of Rural Areas Development Policy in the European Union)*. Wrocław: Uniwersytet Wrocławski (University of Wrocław). pp. 54-55, 57.
7. Miszczuk, A. (2013). *Uwarunkowania Peryferyjnosci Regionu Przygranicznego (Determinants of Peripherality of Border Region)*. Lublin: Norbertinum. pp. 11-16.
8. *National/Regional Innovation Strategies For Smart Specialisation (RIS3). Cohesion Policy 2014-2020. The New Rules and Legislation Governing the Next Round of EU Cohesion Policy Investment For 2014-2020*. (2014). European Commission.
9. Pessoa, A., Silva Rui, M. (2009). *Environment Based Innovation. Policy Questions*. Finisterra, XLIV, 88. p. 71.
10. Ray, Ch. (2006). *Neo-endogenous Rural Development in the EU* in: Cloke P., Marsden T., Mooney P. (ed.), *Handbook of Rural Studies*. London: Thousand Oaks, Calif., SAGE. p. 278.
11. *Rocznik Statystyczny Wojewodztwa Lubelskiego 2015 (Statistical Yearbook of the Lublin Voivodeship in 2015)*. (2015). Lublin: Urzad Statystyczny w Lublinie (Statistical Office in Lublin). pp. 138, 381.
12. Słodowa-Helma, M. (2013). Inteligentne Specjalizacje Polskich Regionów – Nadzieje, Dylematy i Obawy (Smart Specialization Polish Regions - the Hopes, Fears and Dilemmas), *Europa Regionum*, t. 17. Szczecin: Wydawnictwo Naukowe Uniwersytetu Szczecinskiego (Publishing House of the University of Szczecin). pp. 57-59.
13. *Strategia rozwoju wojewodztwa lubelskiego na lata 2014-2020 (z perspektywa do 2030 r.) (The Development Strategy of the Lublin Voivodeship for the period 2014-2020 (with the prospect of 2030))*. (2014). Lublin: Urzad Marszalkowski Wojewodztwa Lubelskiego w Lublinie (Marshal's Office in Lublin Voivodeship). pp. 5-51.

HOME ECONOMICS

INTERNATIONAL REAL ESTATE TRANSACTION IN LATVIA 2011-2015: THEORETICAL AND PRACTICAL ASPECTS

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Abstract. The primary aim of this paper is to determine the most common contemporary meaning of the terms most often used to characterise international real estate transactions. The synonyms of the terms "*international*", "*real estate*", "*transactions*" or terms used in research literature with similar meanings were identified during the research. The secondary aim of this paper is to investigate real estate transactions in Latvia giving primary attention to the period 2010–2014, which was significant because during this time, compared to all other countries in the world, Latvia offered the most inexpensive opportunity for a non-citizen to obtain a temporary residence permit simply by purchasing real estate for the minimum price of EUR 71,139. Latvia's case shows how significantly only one factor – the increase of this minimum price requirement to EUR 250,000 in 2014, affected the number of international real estate transactions in Latvia. A number of research methods were employed for the research, including the historical, empirical and comparative analysis of real estate transactions and the terminology used in this field.

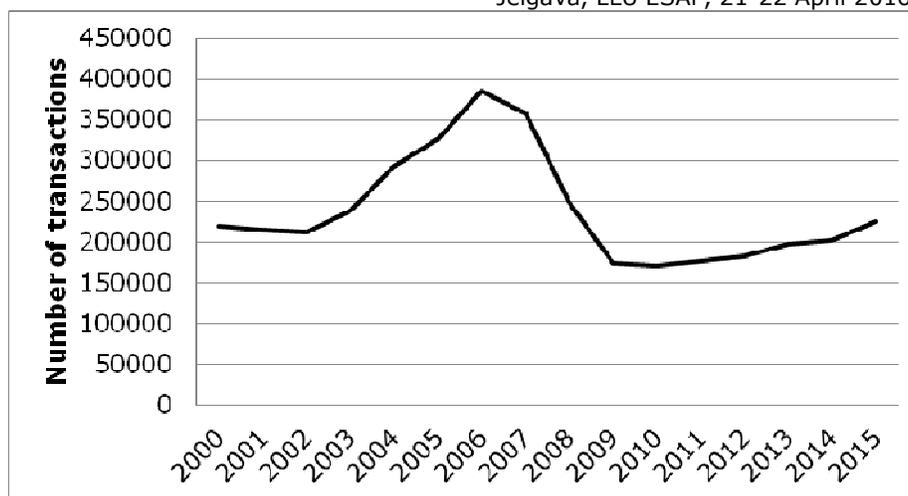
Key words: international real estate transactions, land management, terminology, temporary residence permits.

JEL code: R3, K11, Q15

Introduction

Individuals and legal entities in their lifetime carry out different types of real estate transactions or agreements that are "*intended by the parties to prevent or end a dispute and in which they make reciprocal concessions*" (Black's Law Dictionary, 1999) or unilateral actions, performed by the individuals and by legal entities, which are aimed at the establishment, the amendment or the cessation of civil rights and duties. Some individuals perform transactions on a regular basis, for example, with rent/lease agreements, especially in countries, which have a low home ownership rate (for example, the lowest rates in Europe are in Switzerland with 44 % and Germany with 52.5 % but the highest are in Romania with 96.1 % and Slovakia with 90.3 % (Home ownership rate, 2014)). If the subject is a change in property

rights, transactions are made less frequently. The general view is that in developed nations an individual makes a transaction every ten years on average (Goremykin, 2009); however, precise data are available only if the transactions have been registered. In Latvia's case, all types of transactions – purchase, exchange, mortgage, succession etc. – which have been registered in the Land Register, comprise only a part of the total real estate transactions. The most of rent/lease agreements tend not to be registered (for all registered real estate transactions in Latvia see Figure 1). According to the statistics on the real estate transactions registered in the Land Registry of Latvia, in 2014 the purchase deals made up only 25.28 % of the total number of transactions (Statistics on the Real Estate Transactions Registered in the Land Registry of Latvia).



Source: authors' construction based on the data from Land Registry of Latvia

Fig.1. Number of real estate transactions registered in the Land Registry of Latvia in 2000-2015

This paper focuses on international real estate direct transactions which result in the change of ownership of real estate, i.e. – direct asset deals, with the involvement of a foreign party. First, the terminology and theoretical aspects of international real estate transactions were analysed in the study. Second, direct real estate transactions in Latvia were examined, giving primary attention to the period 2011–2015. When considering the context of the research, the period 2010–2014 was significant because during this time, comparing to other countries in the world, Latvia offered the most inexpensive opportunity for a non-citizen to obtain a temporary residence permit (and thus permission to freely travel around Europe within the countries in the Schengen zone) simply by purchasing real estate for the minimum price of EUR 71 139. The lowest priced real estate that met all the necessary criteria was found solely in the areas outside Riga planning region and outside the nine largest cities of Latvia (Daugavpils, Jekabpils, Jelgava, Jurmala, Liepaja, Rezekne, Riga, Valmiera and Ventspils).

A number of research methods were employed for the research, including the historical, empirical and comparative analysis of the real estate transactions and terminology used in this field. The current legislation of Latvia and

international law were analysed and pertinent literature was reviewed during the research.

Research results and discussion

Terminology used to describe international real estate transactions

Each real estate transaction as a part of real estate management (Kyle and Baird, 1995) is an interdisciplinary or multidimensional (Malloy and Smith, 2013) activity and primarily falls into the competency of the fields of management, law and economics but is not limited only to these. Terminology that is used to describe the transfer of property rights from one party to another is not strictly limited within a particular field but is used in others as well. The term "real estate transaction (deal)" in economic theory is primarily used to describe the transfer of real estate ownership or property rights from one party to another but it can also refer to lease agreements or other long term rights (Cotula, 2011). Moreover, the restrictions concerning foreigners can be in place not only regarding land ownership but also – land use (Hodgson et al., 1999), for example, in the agricultural sector (Bell and Savage, 1979-1980). This needs to be distinguished in the research subject (Hailu et al., 2015). Usually, the term "international real estate transaction" is used regarding a land deal

or "land" is used as a synonym for "real property". Most often only "land deals" have restrictions and limitations. In Latvia, there are no restrictions for foreigners regarding deals with real estate that is – "buildings as separate real estate", however, there are restrictions regarding foreigners acquiring real estate that is a "land". However, there are a wide variety of terms used

to describe international real estate transactions (see in Figure 2), not all of which are synonyms but are terms that describe only a part in the transaction process. That refers to the case with terms "transfer" and "conveyance", which describe only a part of the transaction process. The term "subdivision", which is used as a "transaction" will be explained later.

International	Real estate	Transaction
Cross Border	Land	Deal
Foreign	Real property	Acquisition
Global	Immovable (things, property)	Purchase
Alien	Immobile	Alienation
Non-citizen,-state	Rights in rem / Real rights	Transfer
Foreigner	Residential / Commercial property	Conveyance
Non-resident	Agricultural land	Grab
Foreign national	Land tenure	Transfer of ownership
Non nationals	Land holding	Sell
Overseas	Landed property	Investment
Transnational	Property rights	Changing hands
Other	Other	Turnover
		Foreignization
		Subdivision
		Other

Source: authors' construction based on the research results

Fig.2. Synonyms of terms "international", "real estate" and "transaction" or terms used in scientific literature with similar meaning

Considering the fact that the term "real estate transaction" is broadly used, it is necessary to clarify its use. The primary classification of real estate transactions refers to asset deals and share deals. An asset deal is a real estate transaction involving a direct transfer of rights of immovable property, which results in the transfer of the real estate from one party to another. A share deal, in contrast to direct property rights of real estate, is acquiring of the property rights to the shares of an entity, which holds the property rights of an item of real estate. An exception exists, e.g., in Scandinavia, where apartment owners are stockholders in the entity in Sweden – Bostadsrättsförening, Finland – Asunto-osakeyhtiö, and similar examples exist in other countries.

The term "foreign investment" can be defined as "transfer of tangible or intangible assets from one country to another for the purpose of their use in that country to generate wealth under the

total or partial control of the owner of the assets" (Sornarajah, 2010). Real estate is one form of assets. The term "foreign investment in real estate" can be used to mean:

- an investment in enterprises performing real estate economic activities – 1) "foreign direct investment" (hereafter FDI) – The international standard prescribes that there must be more than 10 % threshold of voting shares, e.g., in Latvia (Figure 4); 2) "foreign indirect (portfolio) investment" with less than 10 % of shares according to the international standard is necessary. In both cases investment may result in indirect real estate transfer of property rights but also may not, if the business enterprise, in which investment is made, carries out real estate activities (Regulation (EC) No 1893/2006), i.e. provides any number of real estate management services;

- the term "*foreign investment in real estate*" can also describe direct real estate transactions, according to international bilateral agreements for the promotion and reciprocal protection of investment. The term "*investment*" "*shall comprise every kind of asset invested in connection with economic activities by an investor of one Contracting Party in the territory of the other Contracting Party in accordance with the laws of the latter and shall include, in particular, though not exclusively: /a/ movable and immovable property as well as any other property rights in rem such as mortgages, liens, pledges, and similar rights...*" (Agreement, 1996).

The term "*subdivision*" is also used as a term for real estate transactions (Stubkjær et al., 2007), which should apply only to a part of the process of the real estate transactions or, more precisely, would be described as "property formation". In order to use the term "*subdivision*", it is necessary in the countries with Civil Law system to define it in the context of the Roman *titulus-modus* theory. This theory states that requirements for the transfer of ownership are *titulus* or *iusta causa* (e.g., purchase agreement but not exclusively) and *modus*, which in ancient Rome initially was *mancipatio*, i.e. a ceremonial act, and later – *traditio* i.e. transfer. During the Middle Ages in some countries it was replaced by registration. In some countries the act of registration is *modus*, i.e. the prescribed manner to obtain real property rights, thus there the real estate registration has a constitutive effect on property rights. In conjunction with this theory a "*subdivision*" is neither *titulus* nor *modus*, because there is no change of property rights.

Each country and its legal system use the term "*real estate*" differently. Land (except cases where private ownership of land is not permitted for ideological reasons (Hodgson et al., 1999), e.g., China, Vietnam and the former USSR) and

buildings are real estate prototypical (Stubkjær et al., 2007) or paradigmatic (Zaibert and Smith, 2004) or real estate by nature in the case of France, where Civil Code prescribes that a property is immovable, either by its nature or by its destination or by the object to which it applies (Civil Code of France, Art. 517). However, not all buildings in every law system are considered as real estate or land fixtures. They can also be considered as a chattel, e.g. a building, which in one country is deemed a fixture, in another can be deemed chattel. Not every object considered by a layperson as real estate is real property in legal terms and, of course, not everything described as real property in legal terminology is seen as real estate by the public (Stubkjær et al., 2007). The determining factors in defining a building as a land fixture or chattel is the degree of annexation, the purpose of annexation and the prevailing custom in that particular part of the world (Friedman and Lindeman, 2013). Buildings can be temporary and be separate property from the land on which they are located, not a land fixture, as in the case of *Superädifikat* in Austria. Buildings and the land, upon which they are located, can be real estate belonging to separate owners with the property rights of each registered in separate sections of Land Registry (in Latvia). Moreover, as in the traditional concept of *superficie* buildings can belong to an owner who is not the landowner (e.g. in Germany – *das Erbbaurecht* and in Spain – *derecho de superficie*, *Niederlanden* – *opstal*). In many countries, for example, in Germany "*immovable property*" is not defined as a legal term but as property rights to objects are divided into movable things and plots of land (*das Grundstück*), buildings are component parts of the plot of land.

The main differences in national law determining the definition of the term "*real estate*" are time limited interests in land, which as a whole can be described as *ius in re aliena* (e.g. *emphyteusis*, *superficies*, *usufruct*,

habitation), easements, buildings (as separate real estate, registered in a different sections of Land Registry), time share property rights, rights in rem, different institutes of apartment property, even – air-borne and sea-going vessels, inland navigation ships and any space objects (Civil Code of Russian Federation, Art. 130) as well as any other objects which are determined to be "immovable" by law. Historically, for various reasons, in some countries mobilizing or de-realty-izing (die Entliegenschaftung) of immovable things or immobilizing or realty-izing of movable things (die Verliegenschaftung) has taken place.

According to the international law, whether or not an object is defined as "real estate", "land" or "immovable property" it is determined by the national law of its location. The Rio declaration on environment and development prescribes that states have the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. European Law determines that in contractual law a contract relating to a right in rem in immovable property or to a tenancy of immovable property shall be governed by the law of the country where the property is situated (Regulation (EC) No 593/2008). Similarly, in the bilateral international conventions it is clarified, for example, in the "Convention between the Government of the Republic of Latvia and the Government of the Republic of Estonia for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income" the term "immovable property" shall have the meaning, which it has under the law of the Contracting State, in which the property is situated.

Countries usually have a wide variety of tests of "foreignness" (Hodgson et al., 1999). Under

international law each State is responsible to define under its own law who is deemed a national and who is not as well as to determine who qualifies as an "alien friend" (Hodgson et al., 1999), with special rights to acquire real estate in a particular country. There are countries, which operate on the principle of reciprocal rights: if you allow us to acquire real estate, we allow you to do as well (e.g., Taiwan and Turkey). In international real estate transactions, parties shall be from a country other than where the real estate is located, which for individuals is usually determined by the nationality or permanent residence or domicile, in rare cases also by ethnicity and by race (Sornarajah, 2010) principle. The nationality of a legal entity is determined by its state of incorporation, management or administrative centre or control (actual owner) principles.

In the political arena, the land deals with foreign parties often raise discussion about national territorial integrity and national security – whether or not foreign ownership would negatively affect national sovereignty or security. Usually, foreigners are restricted from owning land near a country's borders and in other "sensitive" territories. Another important point of argument on the political side regarding foreign ownership is that of allegiance. These are traditional restrictions justified by national security interests. Moreover, in spite of the point of view that economic value of land is increasingly taking a more significant role than its political value (Qin, 2015), the restrictions for foreigners to acquire real estate still exist in the majority of countries. Several nations have no restrictions regarding land ownership by foreigners (e.g. Germany, France, the United Kingdom, Portugal, the Netherlands, Belgium, Luxembourg, Chile, Colombia, Paraguay and Uruguay) (Hodgson et al., 1999).

Considering above mentioned, it is concluded that a language can be a barrier to conceptual understanding and describing each country's real

International direct real estate transactions in Latvia

estate transactions, especially, if the transactions are international. If one law system uses a terminology to describe another system of law's similar activities, there is a basis to the following assertion regarding the legal concept in continental Europe that of all major European languages, English is the one least suitable for talking about (civil or continental) land law, because the common law concepts of land law are completely different from the civil law perspective (Schmid et al., 2005). This encourages careful use of the language in such a way that it is neither a barrier, nor a source for error regarding real estate transactions but rather assists in the understanding of terminology.

Real estate definition in Latvia

The 1937 Civil Code of Latvia went into effect in 1992–1993 after the renewal of Latvia's independence in 1990. The Civil Code of Latvia determines that immovable property in Latvia is land and buildings and other permanent structures are component parts or fixtures of a land. However, in parallel to this, because superficies was not determined, it created a phenomenon, which could be defined as separation of buildings from the land in a way which is not clearly determined by the Latvian law and is regarded in the Latvian practice as an exclusion from the common principles the Civil Law Act is based on (Rozenfelds, 2001). The superficies concept will go into effect in Latvia for non-residential buildings and civil engineering structures only from the January 1, 2017. Therefore, currently the real estate in Latvia can be: 1) land plots or units of land; 2) buildings or structures (with exceptions); and 3) a group of premises (including apartments that can also be undivided shares of a residential building with the rights in rem to use a particular apartment).

In accordance with the theory of *titulus-modus*, the transfer of real estate property rights in Latvia consists of a valid agreement of alienation or other *iusta causa* and registration in the Land Registry. Commonly, all international direct real estate transactions are purchase deals. Restrictions for foreigners to acquire land are set in order to prevent certain foreign parties from other countries from acquiring land. These restrictions apply to real estate transactions of land plots in towns and in rural areas of Latvia (not for buildings as separate property objects). The most significant restrictions to foreigners in rural areas are defined by the Law "On Land Privatisation in Rural Areas", which prescribes that transactions, in the result of which an owner of land changes, including the contractual inheriting of land, alienation of pledged land and investing of land in the fixed capital of incorporated companies, shall be regarded as transactions involving land properties.

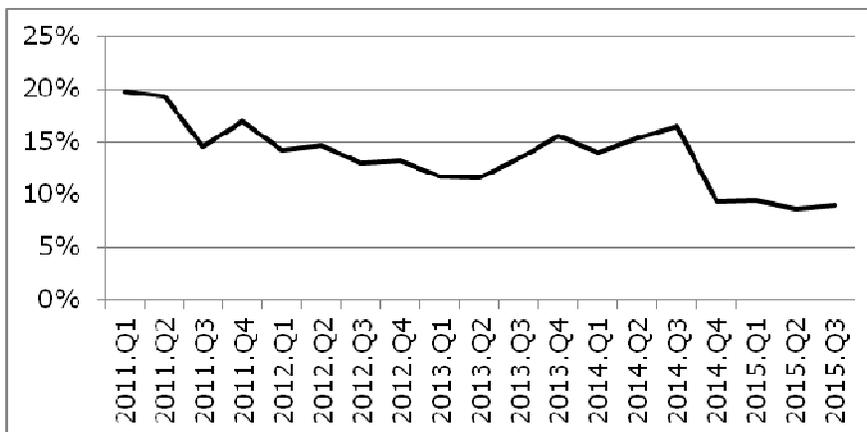
Regardless of the restrictions, which limit foreigners acquiring land plots, the real estate transactions with foreign nationals and legal entities represent a considerable share in Latvia (Figure 3).

There exists stiff competition among countries to bring in foreign investments through property investments or job creation, in exchange for the offer of temporary or permanent residence permits or even citizenship. In this way, the majority of countries attempt to stimulate investments in certain business ventures that create jobs (e.g. Australia, Canada, France, Germany, Japan, New Zealand, South Korea, United States etc.). A pioneer for this kind of real estate purchase transactions was the Caribbean country Federation of Saint Kitts and Nevis which started the so called "Golden Visa" business in 1984, one year after gaining independence from the United Kingdom, with an aim to

stimulate national economy by granting citizenship to foreign investors in exchange for a donation of USD 250 000 to the *Sugar Industry Diversification Foundation* or with the purchase of real estate worth at least USD 400 000.

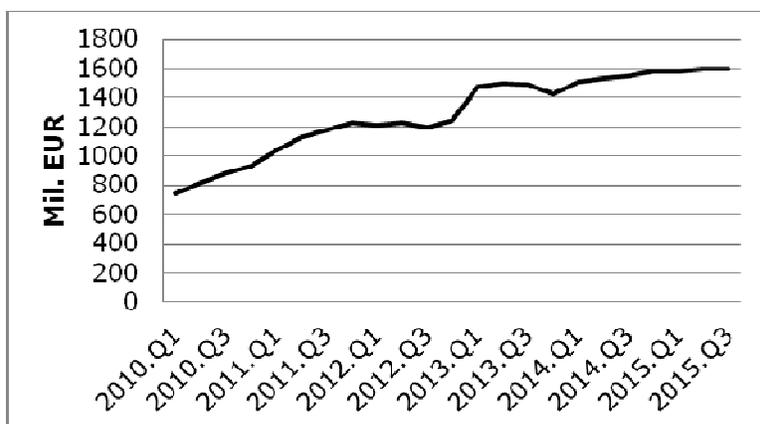
In Latvia, a most significant influence on real estate transactions became the creation of the opportunity for foreigners to obtain a temporary residence permit upon making a real estate

purchase starting with 2010. Latvia, along with many other countries, usually has stipulations that go along with obtaining a temporary or permanent residence or citizenship. Some of these are: a required certificate of non-criminal record, medical insurance, medical examination, absence of any debts to the tax authorities, legality of income etc.



Source: authors' calculations and construction based on data of the State Land Service of Latvia

Fig.3. Percentage of all real estate purchase deals, in which foreigners were involved 2011.Q1-2015.Q3 (Registered in Land Registry of Latvia until 30.12.2015)



Source: authors' construction based on data of the Bank of Latvia

Fig.4. FDI in enterprises performing economic activities of real estate in Latvia, 2010.Q1-2015.Q3, mln EUR

The temporary residence permits programme affects also the FDI as seen in Figure 4, which shows FDI in enterprises that perform economic activities of real estate in Latvia. Since the "Golden Visa" programme was launched in Latvia in 2010, it can be observed that FDI rises significantly and decreases after the minimum price requirement of the real estate, acquired by

foreigners, increased to EUR 250 000 in 2014, Q4.

Conclusions

The main purpose of this research was to analyse terminology used to describe international real estate transactions. The synonyms of the terms "international", "real estate", "transactions" or terms used in research

literature with similar meanings were identified during the research (Figure 2). Because of the large quantity of synonyms used, the introduction section of any real estate transaction research project needs to define the terms "international", "real estate" and "transaction" pertaining to how they are used in particular country. This is of utmost importance especially if the aim of the research is to compare similar economic activities in different countries.

Research shows how immediately and significantly only one factor, i.e. the increase of

the minimum purchase price requirement of real estate for the acquiring of foreign residency permits from EUR 71,139 to EUR 250,000 (in 2014, Q4), can affect the number of international real estate transactions in Latvia.

The research analysis of direct international real estate transactions and FDI leads to a conclusion that real estate direct transactions affected by one factor decreased sharply (in 2014, Q4) and in contrast FDI in enterprises performing real estate economic activities merely slowed down (2014, Q4-2015, Q3).

Bibliography

1. Agreement between the Government of the Republic of Latvia and the Government of the Republic of Estonia for the Promotion and Reciprocal Protection of Investment (1996). Retrieved: <http://likumi.lv/doc.php?id=40178>. Access: 19.09.2015
2. Bell, R.L., Savage, J.D. (1979-1980). Our Land is Your Land: Ineffective State Restriction of Alien Land Ownership and the Need for Federal Legislation. 13 J. Marshall L. Rev. Retrieved: <http://heinonline.org/HOL/LandingPage?handle=hein.journals/jmlr13&div=32&id=&page=>. Access: 20.09.2015
3. Black's Law Dictionary (1999). Garner B.A. Editor in Chief. Seventh Edition. St.Paul: West Group. p.1503.
4. Civil Code of France (1804). Translated by Rouhette, G., Rouhette-Berton, A. Retrieved: https://www.legifrance.gouv.fr/content/download/1950/.../Code_22.pdf. Access: 12.09.2015
5. *Civil Code of Russian Federation. Part One* (1994). Retrieved: <http://www.wipo.int/edocs/lexdocs/laws/en/ru/ru083en.pdf>. Access: 20.12.2015
6. Convention between the Government of the Republic of Latvia and the Government of the Republic of Estonia for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income (2002). Retrieved: <http://likumi.lv/doc.php?id=64098>. Access: 19.09.2015
7. Cotula, L. (2011). *Land Deals in Africa: What is in the Contracts?* London: International Institute for Environment and Development. p.49.
8. Foreign Direct Investments in Latvia. Bank of Latvia. Retrieved: <http://statdb.bank.lv/lb/Data.aspx?id=131>. Access: 30.12.2015
9. Friedman, J.P., Lindeman, J.B. (2013). *Real Estate Licensing Exams. Salesperson, Broker, Appraiser. 9th Edition.* New York: Barron's Educational Series, Inc., 2013. p.50.
10. Goremykin, B.A. (2009). *Sdelki s nedvizimostju: Prakticeskoje posobije (Real Estate Transactions: A Practical Guide)*, Moskva: Filin. p.472.
11. Hailu, Y., Akaeze, H., Adelaja, A., Hanson, S. (2015). Explaining International Land Transactions in Africa. Book Chapter in *Econometric Methods for Analysing Economic Development. Banking, Finance, and Accounting: Concepts, Methodologies, Tools, and Applications. Volume 2-3, September 21, 2015, pp. 797-817.* Retrieved: <http://www-scopus-com.resursi.rtu.lv/record/display.uri?eid=2-s2.0>. Access: 15.10.2015
12. Hodgson, S., Cullinan, C., Campbell, K. (1999). *Land Ownership and Foreigners: A Comparative Analysis of Regulatory Approaches to the Acquisition and Use of Land by Foreigners.* FAO Legal Papers Online. Retrieved: <http://www.fao.org/Legal/default.htm>. Access: 12.05.2015
13. Homeownership Rate in Selected European Countries in 2014. Retrieved: <http://www.statista.com/statistics/246355/home-ownership-rate-in-europe/>. Access: 14.12.2015
14. Kyle, R.C., Baird F.M. (1995). *Property Management. 5th ed. Chicago: Real Estate Education Company.* p.458.
15. Malloy, R.P., Smith J.C. (2013). *Real Estate Transactions. Problems, Cases and Materials.* New York: Wolters Kluwer. Law and Business. p.xxii.
16. Legislation of the Republic of Latvia (1937). *The Civil Law of the Republic of Latvia.* Retrieved: <http://likumi.lv/doc.php?id=225418>. Access: 2.10.2015
17. Legislation of the Republic of Latvia (1992). *On Land Privatisation in Rural Areas.* Retrieved: <http://likumi.lv/doc.php?id=74241>. Access: 15.09.2015
18. Qin, X. (2015). A Political Study on Foreign Ownership of Land: Theoretical Challenges and Justifications. *Manchester Journal of International Economic Law, Volume 12, Issue 2, 2015, Pages 195-211.* Retrieved: <http://www-scopus-com.resursi.rtu.lv/record/display.uri?eid=2-s2.0-84944387097&origin=resultslist&sort=plf>. Access: 25.10.2015
19. Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2 and amending Council Regulation (EEC)

- No 3037/90 as well as certain EC Regulations on specific statistical domains. Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L:2006:393:FULL&from=CS>. Access: 12.09.2015
20. Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I). Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008R0593&from=LV>. Access: 12.09.2015
21. Rio Declaration on Environment and Development. The United Nations Conference on Environment and Development. Rio de Janeiro from 3 to 14 June 1992. Retrieved: <http://www.unep.org/documents.multilingual/default.asp?documentid=78&articleid=1163>. Access: 12.11.2015
22. Rozenfelds, J. (2001). Latvian Property and Collateral Law and Protection of Foreign Investments. *Juridica international. Law Review*. University of Tartu. 2001.VI. dx.doi.org/10.12697/issn1406-1082. Retrieved: <http://www.juridicainternational.eu/?id=12535>. Access: 20.10.2015
23. Schmid, C.U., Hertel, C., Wicke, H. (2005). Real Property Law and Procedure in the European Union. General Report. Final Version./ European University Institute (EUI) Florence/European Private Law Forum Deutsches Notarinstitut (DNotI) Würzburg. Retrieved: <http://www.eui.eu/Documents/DepartmentsCentres/Law/ResearchTeaching/ResearchThemes/EuropeanPrivateLaw/RealPropertyProject/GeneralReport.pdf>. Access: 11.12.2014
24. Sornarajah, M. (2010). *The International Law on Foreign Investment*. Third Edition. Cambridge: Cambridge University Press, 2010. p.128.
25. Statistics on the Real Estate Transactions Registered in the Land Registry of Latvia. Retrieved: <https://www.zemesgramata.lv/inc/stat/stat2.asp?lang=lv>. Access: 30.12.2015
26. Stubkjær, E., Frank, A., Zevenbergen, J. (2007). Modelling Real Property Transactions. An Overview. In *Real Property Transactions: Procedures, Transactions Costs and Models*. European Cooperation in the Field of Scientific and Technical Research (Organization). Amsterdam: IOS Press. 2007. eBook., Database: eBook Academic Collection (EBSCOhost) Retrieved: <http://web.b.ebscohost.com/resursi.rtu.lv/ehost/ebookviewer/ebook/ZTAwMHh3d19fMjg2?sid=9e17934a-fd24-4647-a627-ca7fd157a290@sessionmgr110&vid=3&format=EB&rid=1>. Access: 2.10.2015
27. The Civil Code of the Russian Federation (1994). Retrieved: <http://www.russian-civil-code.com/>. Access: 2.10.2015
28. Zaibert, L., Smith, B. (2004). *Real Estate: Foundations of the Ontology of Property in The Ontology and Modelling of Real Estate Transactions*. Edited by Stuckenschmidt H., Stubkjær E., Schlied C. Hampshire: Ashgate Publishing Limited. p.38.

VALUE AND STRUCTURE OF HOUSEHOLDS' FINANCIAL ASSETS IN POLAND

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Abstract. Households decide to spend a part of their income on goods and services and to save the rest of it. Household's assets can be cumulated as financial assets and as non-financial assets.

The aim of the article is to identify and evaluate changes of households' financial assets value and structure in Poland in 2003-2014. As a background of research, the author considered changes in economic environment. The analysis was conducted with the use of statistical tools: index of the structure and growth rate. The paper also includes Pearson correlation coefficient between real GDP growth rate and households' financial assets real growth rate. The author compared the value of households' financial assets as a percentage of GDP in European countries in 2014.

The results of the research are as follows. Between 2003 and 2014, households' financial assets in constant prices in Poland increased by over 100%. However, households' financial assets value as a percentage of GDP in Poland is still relatively low among European countries. Transferable and other deposits dominate in the structure of households' financial assets in Poland. Shares, equity and a currency have also the significant share in total assets. The value of transferable deposits, listed shares, investment fund shares or units and currency increased at constant prices in analysed period. Correlation analysis shows that there is almost no significant correlation between real annual GDP growth rate and real annual growth rate of households' financial assets.

Key words: financial assets, households.

JEL code: D10, D14, D31.

Introduction

Households decide on distributing of their income between consumption and savings in such a way as to maximize their individual utility function. Households use credit and deposit market and choose between present and future consumption (Utzig, 2013). Lifetime resources, the distribution of these resources, and the age play a critical role in saving decisions. Households who expect rich pensions may not need to accumulate a lot of private savings to provide for themselves when they stop working (Lusardi, 2008). Households' savings are voluntary, when decision about consumption decreasing is made without external pressure, or involuntary, when consumption decreasing results from legal requirements or economical pressure (Bywalec, 2009).

The pattern of financial asset changes with the decrease of household's disposable income. Macroeconomic conditions also affect the amount of household's savings, which can be accumulated as financial assets as well as non-financial assets. The propensity to saving goes up with the increase of household's income (Wojcik, 2007). Factors strongly affecting households'

saving are: public and corporate savings, growth and demography. Households' savings are also determined by: inflation, unemployment, the real interest rate and financial deregulation (Callen, Thimann, 1997). Among socioeconomic factors affecting saving patterns in Polish households the income in the household and the householder's level of education are of great importance. (Aniola-Mikolajczak, Golas, 2014). The age is also an important factor determining household's financial asset structure. Shares of high-risk assets in total households' financial assets are lower in both the younger (under 35) and the older (55-64 and 65+) age groups, compared to the 35-54, and tend to rise with wealth (Bertaud and Starr-McCluer, 2000). The allocation of households' financial assets is determined by the risk level, amount of predicted profit, inflation rate and asset liquidity (Rytelewska, Klopocka, 2010). Household propensity to risky investment is lower within labour income uncertainty and poor health (Cardak, Wilkins, 2009). After the financial crisis in 2007-2009, household saving rate increased (Walden, 2012).

It is also worth indicating that households' financial assets are highly concentrated. The

relevant question for poor households in low-income countries is not how much of financial assets they have, but whether they have any (Honohan, 2006).

The aim of the paper is to identify and evaluate changes of households' financial assets volume and structure in Poland between 2003 and 2014 on the background of GDP growth rate. The tasks of the research are to calculate the growth rate of households' financial assets, to compute the Pearson correlation coefficient between growth rate of analysed assets' categories and GDP growth rate in Poland and to present the value of households' financial assets as a percentage of GDP in European countries.

The analysis was conducted on the basis of the National Bank of Poland and the Central Statistical Office in Poland data covering the period of 2003-2014. The comparison between the value of households' financial assets as a percentage of GDP in European countries in 2014 was made with the use of Eurostat data.

Research results and discussion

A household is the unit consisting of all its members, related or unrelated, who share the same dwelling unit. The most important fact is that household members are sharing their incomes or resources (Smeeding, Weinberg, 2001).

According to the European System of Account definition (2013), financial assets consist of all financial claims, equity and the gold bullion component of monetary gold.

Households' financial assets according to the National Bank of Poland specification are (the National Bank of Poland dataset):

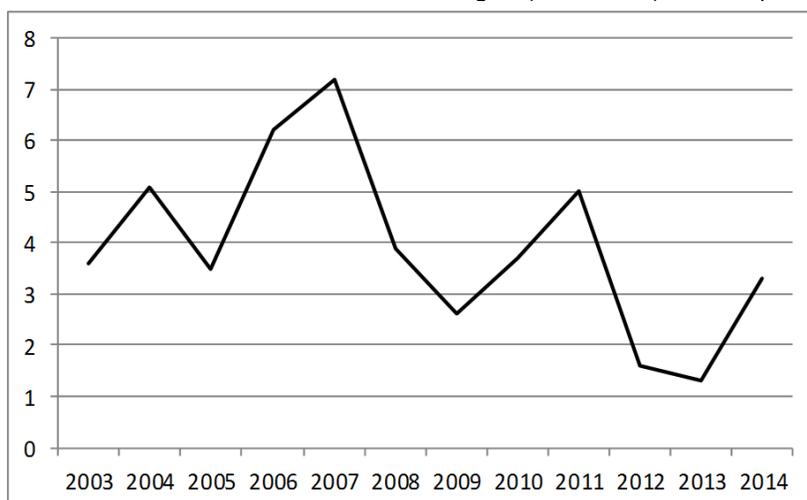
- currency;
- transferable and other deposits;
- short- and long-term debt securities;

- short- and long-term loans (including households deposits in brokerages and saving bonds posed by households);
- listed shares;
- unlisted shares and other equity;
- investment fund shares or units;
- non-life insurance technical reserves;
- net equity of households in pension fund reserves;
- prepayments of insurance premiums and reserves for outstanding claims;
- other account receivable.

According to the European System of Accounts (2013), transferable deposits are deposits exchangeable for currency on demand and which are directly usable for making payments by cheque, draft, giro order, direct debit/credit, or other direct payment facilities, without penalty or restriction. Other deposits include time deposits, which are not immediately disposable and saving deposits.

Some of household's financial assets are collected voluntarily (currency, deposits, debt securities, shares and equity, investment fund shares or units) and some of them are collected obligatorily (equity of households in pension fund reserves). Some of household's financial assets are characterised by high liquidity (currency, transferable deposits) and some are not liquid.

The most popular measure of economic development is gross domestic product growth rate. A business cycle is often defined in terms of the alternation between periods of expansion and recession in the level of economic activity or as transitory fluctuations in economic activity around a permanent or "trend" level (Morley, Piger, 2012). The value of real GDP growth rate (%) in Poland in the period of 2003-2014 is presented in Figure 1.



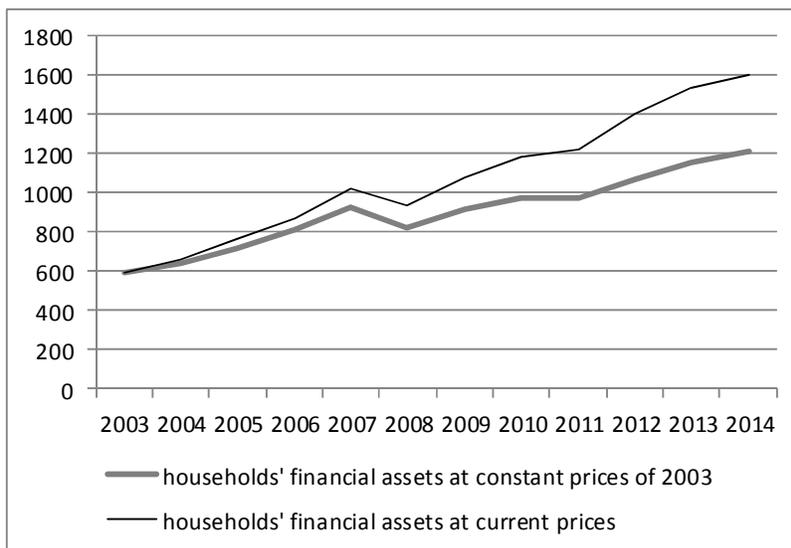
Source: author's construction based on the data of the Central Statistical Office in Poland

Fig. 1. Real GDP growth rate in Poland, %

In Poland, only economic slowdown was observed in the years 2007-2009, and recession did not occur. The second wave of economic slowdown was observed during years 2011-2012. The highest real GDP growth rate was observed

in 2007, just before the economic and financial crisis in Europe.

Figure 2 presents value of households' financial assets in 2003-2014 at current prices against its level at constant prices of 2003.



Source: author's construction based on the data of the National Bank of Poland

Fig. 2. Households' financial assets at current and constant prices, billions of national currency – PLN

In the years 2003-2014 households' financial assets value increased by 171 % at current prices and by 105 % at constant prices. The decrease was observed only in 2008, the year when financial and economic crisis began. It can

be stated that households in Poland are becoming more and more interested in accumulating financial assets.

Table 1 presents internal structure of households' financial assets in Poland and real growth rate of households' financial assets in 2003-2014. Only non-zero financial assets were included in the table.

**Internal structure of households' financial assets in Poland and its real growth rate
in 2003-2014, %**

	Internal structure												Real growth rate in 2003-2014
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Currency	7.8	7.0	6.7	7.3	7.0	9.0	7.8	7.4	7.9	7.0	7.2	7.9	106
Transferable deposits	10.6	9.9	11.0	12.5	13.5	15.5	17.2	19.1	19.0	16.9	18.2	18.8	263
Other deposits	26.0	22.5	18.9	15.7	13.1	21.2	19.3	17.3	20.7	20.7	18.3	19.4	53
Short-term debt securities	0.5	0.6	0.3	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	-94
Long-term debt securities	1.4	1.2	1.0	0.8	0.7	0.8	0.5	0.5	0.6	0.6	0.3	0.3	-61
Short-term loans	0.2	0.2	0.3	0.5	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	282
Long-term loans	1.3	1.2	1.1	0.9	0.6	0.9	0.8	0.6	0.6	0.6	0.6	0.6	-5
Listed shares	2.0	2.9	3.3	5.8	5.9	3.0	3.8	4.4	3.2	2.7	3.0	2.6	169
Unlisted shares	9.0	13.7	12.6	10.7	10.7	6.2	7.0	5.7	5.8	6.8	5.2	3.5	-19
Other equity	18.7	17.5	17.4	13.8	13.7	10.6	10.2	9.6	9.0	11.0	12.7	12.6	39
Investment fund shares or units	5.2	4.6	6.8	9.1	10.8	5.7	6.1	5.9	4.8	4.8	5.6	6.1	140
Non-life insurance technical reserves and provisions for calls under standardized guarantees	2.4	2.2	2.0	1.8	1.7	2.0	1.8	1.8	1.8	1.7	1.6	1.7	42
Life insurance and annuity entitlement	5.1	5.3	5.4	5.9	6.0	7.1	6.1	6.1	5.5	5.3	5.0	4.9	97
Pension entitlement, claims of pension funds on pension manager and entitlement to non-pension benefits	7.7	9.5	11.6	13.8	14.3	15.4	17.2	19.4	19.0	20.0	20.4	10.3	174
Other accounts receivable/payable, excluding trade credits and advances	2.2	1.8	1.6	1.2	1.6	2.1	1.8	1.7	1.7	1.5	1.4	11.0	930

Source: author's calculations based on the data of the National Bank of Poland

Transferable and other deposits dominate in the pattern of households' financial assets (27-40 %). It is worth indicating that the relationship between transferable and other deposits changed in the analysed period. In 2003-2005, the share of other deposits was about two times higher than the share of transferable deposits. In 2007 and 2010 the share of other deposits in total households'

financial assets were lower than the share of transferable deposits, in contrast to the rest of analysed period.

The share of currency in total households' financial assets was rather stable (7-8 %). Only in 2008, the first year of economic slowdown, the share of currency was higher at the level of 9 %. The significant change in the share of pension entitlements in 2014 was caused by transferring

PLN 150 bln from open pension funds to the Polish Social Insurance Institution (ZUS).

The decrease of the value of listed shares and investment fund shares or units in 2008 was caused by the downturn at the Warsaw Stock Exchange, when WIG index decreased by 51 % as the reflection of the financial crisis.

The highest increase was observed in the category of assets: other accounts receivable/payable but this increase results from transferring assets from open pension funds to the Polish Social Insurance Institution in 2014. Among significant financial assets' categories, the values increased at constant prices in categories: transferable deposits (by 263 %), listed shares (by 169 %), investment fund shares or units (by 140 %) and currency (by 106 %).

The Pearson correlation coefficient between growth rate of analysed asset's categories and GDP growth rate in 2003 constant prices was computed to examine if there is any correlation between real value of households' financial assets categories and economic slowdown in Poland.

Pearson correlation coefficient was defined as:

$$r_{XY} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y} \quad (1)$$

When $\text{cov}(X, Y)$ is the covariance between X and Y, σ_X and σ_Y - standard deviations of X and Y.

Correlation significance was examined by comparing empirical value

$$t_0 = |r_{XY}| \frac{\sqrt{n-2}}{\sqrt{1-r_{XY}^2}} \quad (2)$$

to t statistic for n-2 degrees of freedom (Starzynska, 2002). The results are presented in Table 2.

At the significance level of 0.05 only the real growth rate of long-term loans is significantly correlated with real GDP growth rate. Previous research using quarterly data shows that there is significant correlation between real GDP growth rate and households' financial assets real growth rate (Utzig, 2013) so it can be stated that annual data are insufficient to evaluate if there is any correlation between analysed variables.

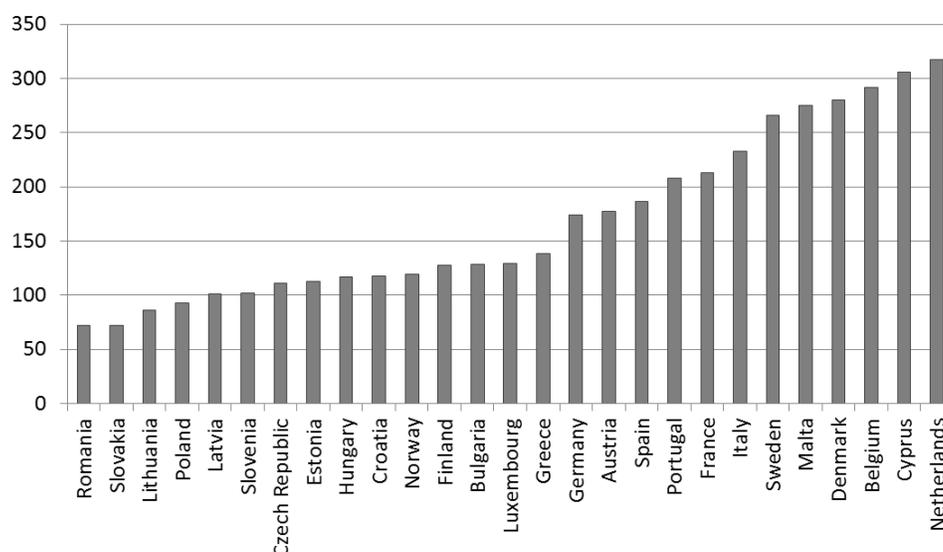
To evaluate the value of households' financial assets in Poland it was compared to the value of households' financial assets in European countries (Figure 3).

It was observed that in Poland, Lithuania, Latvia, Slovenia, households' financial assets as a percentage of GDP are at the level of 90-100 %. Households in those countries do not pose as much of financial assets as in the Netherlands, Cyprus, Belgium, Denmark, Malta and Sweden, where households' financial assets exceed 250% of GDP.

Correlation between annual GDP growth rate and households' financial assets categories annual growth rate at constant prices of 2003 in Poland

Specification of households' financial assets	Pearson correlation coefficient between households' financial assets annual real growth rate and GDP annual real growth rate
Currency	0.359
Transferable deposits	0.225
Other deposits	-0.134
Short-term debt securities	-0.191
Long-term debt securities	0.321
Short-term loans	-0.013
Long-term loans	-0.623
Listed shares	0.288
Unlisted shares	0.136
Other equity	-0.460
Investment fund shares or units	0.084
Non-life insurance technical reserves and provisions for calls under standardized guarantees	-0.105
Life insurance and annuity entitlement	0.486
Pension entitlement, claims of pension funds on pension manager and entitlement to non-pension benefits	0.190
Other accounts receivable/payable, excluding trade credits and advances	-0.086

Source: author's calculations



Source: author's construction based on Eurostat data

Fig. 3. Households' financial assets as a percentage of GDP in European countries in 2014

Conclusions

The paper analyses households' financial assets value and structure in Poland in the years 2003-2014. The analysis shows that:

- 1) households' financial assets in Poland increased by over 100% in constant prices in the period 2003-2014; this increase can be evaluated as significant;
- 2) in Poland, households' financial assets value as a percentage of GDP is rather low (about 100%) among European countries (even 200-300%); relatively low level of households' financial assets is also observed in Romania, Slovakia, Lithuania, Latvia and Slovenia;

3) transferable and other deposits dominate (30-40%) in the structure of households' financial assets in Poland with the significant role of shares and equity (20-30 %) and a currency (7-9 %);

4) among significant households' financial assets the value increased in categories: transferable deposits (by 263 %), listed shares (by 169 %) and investment fund shares or units (by 140 %);

5) correlation analysis shows that there is almost no significant correlation between real annual GDP growth rate and households' financial assets categories real annual growth rate; using quarterly data may lead to different conclusion.

Bibliography

1. *European System of Account*. ESA 2010 (2013). Publications Office of the European Union.
2. Aniola-Mikolajczak, P., Golas, Z. (2014). The Socioeconomic Conditions of Saving Behaviours in Polish Households. *Acta Scientiarum Polonorum. Oeconomia*, 13(4), pp. 7-17.
3. Bertaut, C., Starr-McCluer, M. (2000). Household Portfolios in the United States. *FEDS Working Paper*, 2000-26.
4. Bywalec, Cz. (2009). *Ekonomia i finanse gospodarstw domowych (Household Economics and Finance)*. PWN, Warszawa.
5. Callen, T., Thimann, Ch. (1997). Empirical Determinants of Household Saving: Evidence from OECD Countries. *IMF Working Paper*, 97/181, pp. 1-16.
6. Cardak, B., Wilkins, R. (2006). The Determinants of Household Risky Asset Holdings: Australian Evidence on Background Risk and Other Factors. *Journal of Banking & Finance*, 33, pp. 850-860.
7. Honohan, P. (2006). Household Financial Assets in the Process of Development. *World Bank policy research Working Paper*, 3965.
8. Lusardi, A. (2008). Household Saving Behavior: the Role of Financial Literacy, Information, and Financial Education Programs. *NBER Working Paper Series*, 13824.
9. Morley, J., Piger, J. (2012). The Asymmetric Business Cycle. *Review of Economics and Statistics*, 94(1), pp. 208-221.
10. Rytelawska, G., Klopocka, A. (2010). *Wpływ czynników demograficznych na poziom i strukturę oszczędności gospodarstw domowych w Polsce (The Impact of Demographic Factors on the Level and Structure of Household Savings in Poland)*. *Bank i Kredyt*, 41 (1), pp. 57-80.
11. Starzynska, W. (2002). *Statystyka praktyczna (Practical Statistics)*. PWN, Warszawa.
12. Smeeding, T., Weinberg, D. (2001). Toward a Uniform Definition of Household Income. *Review of Income and Wealth*, 47.1, pp. 1-24.
13. Utzig, M. (2013). Aktywa finansowe gospodarstw domowych a koniunktura gospodarcza (Households' Financial Assets and Economic Prospect). *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 305, pp. 744-753.
14. Walden, M. (2012). Will Households Change Their Saving Behaviour After the „Great Recession”? The Role of Human Capital. *Journal of Consumer Policy*, 35, pp. 237-254.
15. Wojcik, E. (2007). Polskie gospodarstwa domowe na rynku oszczędności (Polish Households on Savings Market). *Bank i Kredyt*, 38(7), pp. 55-66.