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**Faculty of Economics and Social
Development**

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**ECONOMIC SCIENCE FOR RURAL
DEVELOPMENT 2019**

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Latvia**



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Time schedule of the conference

Preparation of the proceedings and organization: January 2019 – May 2019

Conference: 9-10 May 2019

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

Agricultural University in Cracow	Poland
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Latvian Rural Advisory and Training Centre	Latvia
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Liepaja University	Latvia
Ludwigshafen University of Business and Society University of Applied Sciences	Germany
National Academy of Internal Affairs	Ukraine
National Research Institute of Animal Production	Poland
National University of Life and Environmental Sciences of Ukraine	Ukraine
Pedagogical University of Cracow	Poland
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Foreword

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 9-10 May 2019 are published in 3 thematic volumes:

No 50 Rural Development and Entrepreneurship
Production and Co-operation in Agriculture

No 51 Integrated and Sustainable Regional Development
Marketing and Sustainable Consumption

No 52 New Dimensions in the Development of Society
Home Economics
Finance and Taxes
Bioeconomy

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.

This year for the first time the conference includes the section on a new emerging kind of economy-bioeconomy. The aim of bioeconomy is to use renewable biological resources in amore sustainable manner. Bioeconomy can also sustain a wide range of public goods, including biodiversity. It can increase competitiveness, enhance Europe's self-reliance and provide jobs and business opportunities.

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.

We would like to thank all the authors, reviewers, members of the Programme Committee and the Editorial Board as well as supporting staff for their contribution organising the conference.

On behalf of the conference organisers

Anita Auzina

Associate professor of Faculty of Economics and Social Development
Latvia University of Life Sciences and Technologies

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RURAL DEVELOPMENT AND ENTREPRENEURSHIP

CULINARY TOURISM AS A WAY TO USE THE POTENTIAL OF RURAL AREAS: THE CASE OF SWIETOKRZYSKIE PROVINCE

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Abstract: The aim of the article is to show culinary tourism as a way to use the potential of rural areas and agriculture. The study investigates the following research problems: What factors determine the choice of regional products by consumers? Why people decide to participate in culinary events? Which food products are identified by respondents as originating from the Swietokrzyskie Province? The study involved a desk research method and a method of a diagnostic survey conducted in the form of an online questionnaire. The empirical research was carried out in the first quarter of 2018 on a non-random sample of 322 persons. The research shows that food and traditional products of Swietokrzyskie Province are highly rated by the respondents. They are happy to participate in culinary events, which are not only a place to sell food, but also serve as a tool for cultural education and promotion of the entire region.

Key words: culinary tourism, food, rural areas, Swietokrzyskie Province.

JEL code: D1, D2, M2, Q1,

Introduction

Rural areas are a natural place for the production of food and raw materials for the food industry. Typical recipients of agricultural products are processing plants (mainly dairies, mills, butcheries, fruit and vegetable processing plants), chain and retail outlets as well as the consumers themselves (sales at marketplaces). Meanwhile, socio-economic changes taking place in rural areas and new consumer trends encourage rural residents to look for new forms of sale for on-farm produced food. An example is a food cooperative that has proved successful in large cities. It is a form of cooperation between family farms and consumers without the participation of intermediaries like wholesalers, shopping centres or supermarkets. Another form of entrepreneurship that facilitates the sale of on-farm produced and even processed food is culinary tourism. In this type of tourism food, its production, processing and consumption become the main tourist attraction. Culinary tradition is an inherent element of the regional cultural heritage, which is why culinary tourism can be treated as a form cultural exploration. Although culinary tourism can develop both in cities and in rural areas, the country - as a place of food production - is naturally predestined to host this form of tourism (Balinska A., 2017). It should also be emphasized that vacationers in rural areas increasingly often demonstrate interest in regional cuisines and the will to taste traditional dishes (Zawadka J. 2015a, 2015b). It is also important that the sale of culinary products takes place at the place where they have been produced or in its vicinity, which significantly reduces delivery costs and prevents possible quality loss in transport or during storage.

More precisely, the term „culinary tourism” covers trips aimed at exploring (Balinska A., 2016):

- traditional, regional and national dishes,
- culinary novelties,
- products of famous chefs and confectioners,
- methods of manufacturing food products protected by EU legislation (Protected Designation of Origin, Protected Geographical Indication and Traditional Speciality Guaranteed),
- vegetables and fruits typical of a given region, and animal husbandry,
- local, regional and national alcoholic beverages.

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Alcohol beverages, places and know-how of their production as the main attraction of a trip allow the identification of two more homogeneous forms of tourism, i.e. enotourism (wine tourism) and beer tourism (Sieczko A. 2017 pp 105-114; Montella M.M., 2017; Winfree J., McIntosh Ch., Nadreau T., 2018, Zawadka J. 2018).

Another important factor in culinary tourism is the diversity of culinary traditions and customs in various parts of the country. This increases the attractiveness of regions which have specific dishes and products typical of their geographical origin, but also the attractiveness of culinary tourism itself as a way of spending free time. The experiences of a tourist visiting different regions will vary. As A. Matusiak notes, „through the culinary art and through the world of smells and tastes, a tourist can fully and profoundly get to know the culture” (Matusiak A., 2009,). Food and everything that is associated with it, from agricultural production, through processing, to packaging and storage is an attraction in itself.

Culinary tourism in the countryside is a good combination of agricultural and tourist functions. Farmers (agricultural producers) can play various roles in culinary tourism, including:

- 1) producers of food delivered to restaurants, bars, hotels etc.,
- 2) producers and sellers of food in public space (market halls, marketplaces),
- 3) hosts providing food services on their own farm,
- 4) organising workshops and lessons about the production know-how and food processing (e.g. as owners of educational farms),
- 5) hosts providing comprehensive tourist services (accommodation, food and recreation) on their own farms as part of agritourism,
- 6) instructors at traditional cooking workshops.

The farmer, as a food producer or a manufacturer of on-farm processed food or even a housewife can sell what they produce regardless of the quantity. Retail chains are usually interested in large batches of goods but a single tourist (or a group of tourists) is focused on high quality and authenticity of food. Therefore, areas with low-commodity agriculture, dominated by small, family farms make a good destination for culinary tourism. An example of such an area is the Swietokrzyskie Province, selected for this study.

The support of institutions and organizations operating in the field of agriculture is also important for the development of rural culinary tourism. The key role of institutions has been discussed by Smalinskis J. and Auzina A. (2017). The preservation of traditional dishes and flavours is also part of the European Union policy, an example of which is the protection of traditional products' names in the form of the Protected Designation of Origin, Protected Geographical Indication and Guaranteed Traditional Specialty. An interesting initiative aimed at protection and promotion of traditional culinary art is the European Network of Regional Culinary Heritage, where entities from Poland successfully participate. The Ministry of Agriculture and Rural Development in Poland holds the List of Traditional Products, which by 23rd November 2018 included 1864 products. Also public persons and various organizations, such as Slow Food, stimulate consumer needs to discover regional food and learn about the region's culture from the culinary perspective (Jeczmyk A., Sammel A., 2012).

Culinary tourism is a very friendly form of tourism as it can be practiced by people of all ages with different needs and constraints regarding physical activity, including seniors whose culinary experiences are usually very rich. K. Szpara and M. Gwozdz classify culinary tourism as educational tourism and even „special interest tourism” (Szpara K., Gwozdz M., 2011). The research of many authors shows that culinary experience is becoming a highly valued element of travel (Krupa J. 2010,

Borowska A., 2013) and the most appreciated aspect is that sales, consumption and tasting of food take place at or near the production site, which also has an educational dimension.

The aim of the article is to show culinary tourism as a way to use the potential of rural areas and agriculture. The study investigates the following research problems: What factors determine the choice of regional products by consumers? Why people decide to participate in culinary events? Which food products are identified as originating from the Swietokrzyskie Province? The study involved a desk research method and the method of a diagnostic survey which had the form of an online questionnaire posted on forums that focused on travelling, food, cooking etc. The empirical research was carried out in the first quarter of 2018. The selection of respondents was non-random, and the selection criterion was visiting Swietokrzyskie Province at least once in a lifetime¹.

Research results and discussion

1. Characteristics of the research area

Swietokrzyskie Province is one of the 16 administrative regions of Poland, located in the central part of the country. It covers an area of 11.7 thousand km² and is inhabited by 1.25 million people. The traditional cuisine of this area was not only influenced by natural and economic conditions. Swietokrzyskie Province is still one of the poorest regions in Poland (the level of GDP per capita in this region is about 47 % of the EU average). The province is characterised by considerable differences in the economic structure in relation to the national average for individual economic sectors. The structure of gross value added (GVA) shows a large share (over 5 %) compared to the national average (3.6 %) of the agriculture, forestry, hunting and fisheries sector concentrated in the southern part of the region, (Development Strategy ..., 2013). Almost half of the area (47 %) is arable land belonging to agricultural holdings. Soil quality is characterized by a considerable polarization caused by the presence of soils with bonitation class I - III in the south-eastern part of the province and poor soils in the north-western part. The average size of farms also varies, ranging from 6.47 ha in the Opatow Powiat to 1.82 ha in Skarzysko Powiat (www.wrota-swietokrzyskie.pl). It should be emphasized that these are small farms, compared to the average farm size in Poland, which is 10.81 ha. (www.arimr.gov.pl). Production is multidirectional, although there are areas dominated by horticulture or fruit-growing (near Sandomierz, Ostrowiec Swietokrzyski). Small farms and rather extensive agriculture translated into regional cuisine relying on products from farmers' own crops and simple ingredients (potatoes, groats, mushrooms, flour).

Swietokrzyskie Province is an interesting tourist area. It is home to many tourist attractions, such as the „Krzysztopor” castle in Ujazd, the royal castle in Checiny, the town of Sandomierz rich in historic sites, the monastery complex „Swiety Krzyz”, the ethnographic park in Tokarnia, the fun and miniature park „Sabat Krajno”, the jurassic park in Baltow, Swietokrzyski National Park, landscape parks of the Swietokrzyskie Mountains and Ponidzie and many more. The supply of visitor accommodation is average for Poland. According to the data from Central Statistical Office, the number of accommodation facilities with minimum 10 beds was 248, which is 2.3 % of such facilities in the country (Tourism ..., 2018). There are also agritourism farms operating in the province, the number of which is estimated at around 320 (swietokrzyskie.ksow.pl/rolnictwo.html). They make a very good base for the development of culinary tourism.

¹ The survey was conducted by Zaneta Skalska

2. Results of empirical research and discussion

The survey study was conducted on a sample of 322 people, 175 women (54.3 %) and 147 men. The age of respondents was diverse, although young people - under 25 years of age - prevailed (49.4 % of the sample).

Table 1

Respondents' age by gender

Gender	Age groups				
	18-25	26-35	36-45	46-55	56≤
Women (N=175)	31.4	24.6	18.3	16.6	9.1
Men (N=147)	21.8	19.7	24.5	17.0	17.0

Source: authors' research

Women predominated in the younger groups while men - in older groups (Table 1). Over half of the respondents had higher education (51 %). The remaining ones declared secondary education (39 %) and basic vocational education as well as primary education (10 %). The majority of respondents lived in rural areas (39.8 %) and large cities - over 500,000 residents (19.9 %). The vast majority (59.9 %) declared that they lived permanently in the Swietokrzyskie Province. Residents of the remaining provinces usually spent no longer than two days in the studied region. Research by other scientists confirms that culinary tourism usually takes the form of short-term trips (Orlowski D., Wozniczko M., 2016).

One of the aims of the study was to investigate the recognisability of food products and dishes typical of the Swietokrzyskie Province. Interestingly, almost half of the respondents (49.7 %) admitted that they did not know the traditional and regional dishes of the Swietokrzyskie cuisine. The others declared that they know: a soup called „zalewajka swietokrzyska”, a popular candy „krowka opatowska” (a fudge), luncheon meats and other meat products as well as dishes made of potatoes („prazoki” and „kugiel”). The authors also investigated the significance of specific criteria in the selection of regional products by the respondents, as shown in Table 2.

Table 2

Significance of factors determining the choice of regional products by respondents, on a scale of 1-5, where 5 is the highest (%)

Factor/ Criterion	Rating the scale (in %)					Average rating
	1	2	3	4	5	
Quality certificate	0.9	4.0	4.0	19.9	71.1	4.6
Original ingredients	2.8	5.0	12.4	33.2	46.6	4.2
Taste attributes (appearance, smell, texture)	1.2	5.0	12.4	31.7	49.7	4.2
Uniqueness of the product / food (it cannot be bought elsewhere)	4.3	9.0	14.0	28.0	44.7	4.0
Recommendation / opinions of other consumers	9.0	10.6	23.3	37.6	19.7	3.5
Price	7.1	13.7	26.7	25.8	25.8	3.5
Speed of meal preparation	9.9	18.9	30.1	27.0	14.0	3.2

Source: authors' research

The most important factors, as declared by the respondents, included the quality certification of the chosen product, its originality and sensory values. High quality is an indispensable feature especially regarding traditional and regional products, which has also been pointed out by B. Gulbicka (2014). The originality of ingredients was also highly rated by the respondents. This conclusion seems

to be confirmed by the research of J. Szlachciuk and others (2017), which shows that when it comes to choosing traditional products the crucial factor is their connection with the region, which can be interpreted as the originality of ingredients. The least important was the speed of meal preparation, price and whisper marketing (Table 2).

An interesting and effective way to promote and sell food products are culinary events. Notably, this kind of events also promote natural and cultural assets of the region (historical sites, museums, festivals) and tourist infrastructure (visitor accommodation, food service facilities, agritourism farms, horse farms and tourist trails). People arriving at culinary events usually visit the region or receive information about tourist attractions and pastime activities available in the region. Świętokrzyskie Province also hosts numerous culinary events. The respondents recognized the following events: Dymarki Świętokrzyskie (archaeological festival), Świętokrzyskie Święto Zalewajki (local soup festival), Święto Chleba (bread festival), Świętokrzyski Jarmark Agroturystyczny (agritourism festival), Święto Kielc (Kielce town festival) and Festiwal Smakow (food festival). These events are usually held in places that are interesting in terms of regional culture, such as the open-air ethnographic museum in Tokarnia, which is an additional tourist attraction. This was one of the factors that the respondents found important in encouraging participation in culinary events. Details on this topic are presented in Table 3.

Table 3

**Significance of factors determining the participation of respondents
in culinary events in the Świętokrzyskie Province**

Factors	Assessment					Average assessment
	1	2	3	4	5	
Opportunity to taste local dishes and regional products	2.5	5.0	9.6	23.0	60.0	4.3
Opportunity to buy products unavailable in other regions of the country	3.4	7.8	15.0	35.4	38.5	4.0
Combination of the region's cultural offer with the culinary offer (attractiveness of the offer)	2.1	7.5	16.1	33.2	41.0	4.0
Wish to get to know the Świętokrzyskie region (curiosity)	2.8	10.2	17.0	26.4	43.5	4.0
Wish to gain new experiences and skills in the preparation of meals	4.7	15.0	20.5	21.4	38.5	3.7

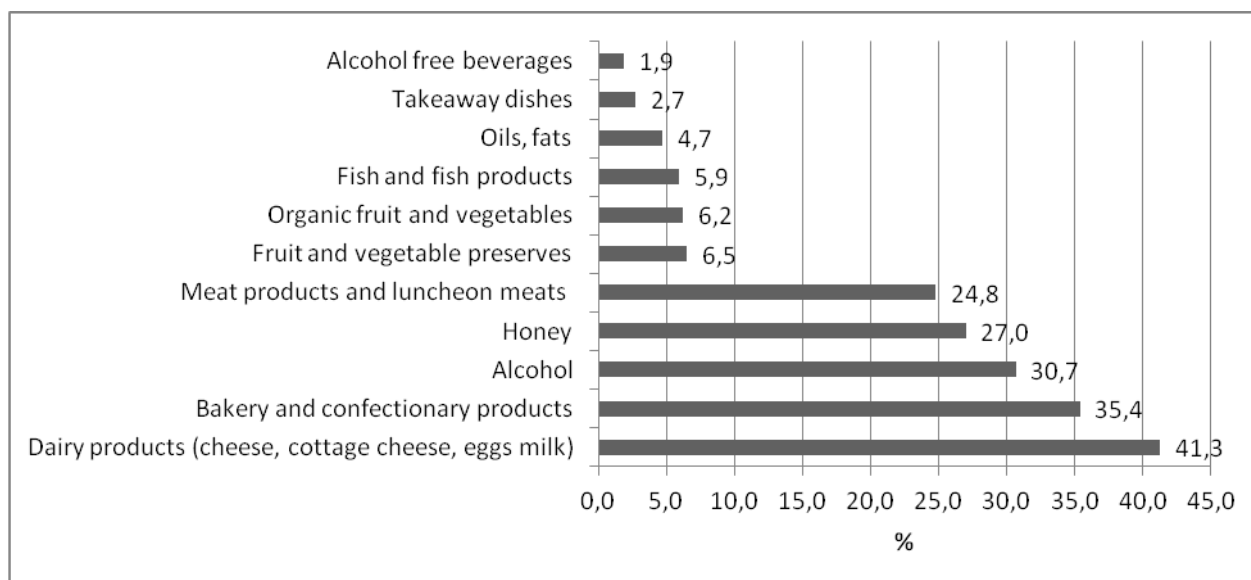
Source: authors' research

The main reason for participating in culinary events was the opportunity to taste local dishes typical of the area. The least encouraging factor indicated by respondents was the wish to participate in culinary workshops. These conclusions are confirmed by the research of A. Smalec (2014), which showed that participants of culinary events most often search for and taste traditional products, manufactured locally and unavailable in retail chains.

The vast majority, almost 70 % of respondents admitted that they always bring souvenirs in the form of food from tourist trips and culinary events. This was characteristic of people of all ages, with respondents aged 36-45 dominating in this respect (75 % of people in this age group). Products brought from culinary events were very diverse (Figure 1).

Interestingly, the most popular souvenirs were fresh and processed products with relatively short shelf life like dairy products and eggs, bakery and confectionery products as well as alcohol. These

product groups were more often purchased by women than men. Men in turn more often chose meat products, fruit and vegetable preserves and honey. This popularity of food products brought as souvenirs results primarily from the fact that the tourists seek authenticity. This fact has already been observed by M. Banaszewicz (2011), as well as J. Geresz, D. Fiszer (2015). It should also be noted that honeys are quite popular with respondents. According to A. Borowska's research, honey producers are more and more willing to present and sell their products at cultural and culinary events (Borowska 2018). The popularity of this product may also be boosted by the beneficial healing properties commonly attributed to it, which are now highly appreciated.



Source: authors' research

Fig. 1. **Food products brought from tourist trips as souvenirs and gifts**
 (Respondents could indicate more than one answer)

Conclusions

- 1) Culinary tourism may constitute an interesting combination of agricultural and tourism functions of rural areas. What's more, it fits in with contemporary consumer trends involving the search for traditional authentic flavours. It is also an interesting and promising perspective for rural residents. The benefits of its development are multidirectional, and the most important include:
 - expanding the market for food products through shops, fairs, culinary events, food service facilities and agritourism farms
 - maintaining traditional rural settlement with its characteristic function, which is agriculture,
 - maintaining traditional crops and breeding, and thus maintaining biodiversity,
 - preservation and cultivation of traditional recipes,
 - prevention of rural depopulation and changes in the agrarian structure,
 - promotion of the region.
- 2) The presented research results demonstrate a favourable perception of regional products, high popularity of culinary events and food products as souvenirs brought from tourist trips. This is one of the effects of the development of culinary tourism and effective promotion of the region.
- 3) The main factor determining the choice of regional products by consumers was the guaranteed level of quality.
- 4) The prerequisite for participation in the culinary event was the opportunity to try local dishes and regional products.
- 5) The respondents associate the Swietokrzyskie Province with dishes (mainly soups) and sweets.

Bibliography

1. Agencja Restrukturyzacji i Modernizacji Rolnictwa www.arimr.gov.pl (date of access 15.01.2019)
2. Balinska, A. (2016). Znaczenie turystyki w rozwoju gmin wiejskich na przykładzie obszarów peryferyjnych wschodniego pogranicza Polski (The importance of tourism in development of rural communes, illustrated by the example of the peripheral territories of the eastern borderland of Poland), Wydawnictwo SGGW, Warszawa
3. Balinska, A. (2017). Culinary Tourism is a Form of Rural Tourism Aimed at Seniors. *Intercathedra*, 33/2, pp. 7-13
4. Banaszkiewicz, M. (2011). Pamiatki turystyczne – w poszukiwaniu tożsamości (Tourist souvenirs – in search of identity). *Turystyka Kulturowa*, Nr 4/2011 (kwiecień 2011), pp. 4-16
5. Borowska, A. (2018). Regional Honeys in Poland in 2010-2015. Proceedings of the 2018 International Conference „ECONOMIC SCIENCE FOR RURAL DEVELOPMENT” No 47 Jelgava, LLU ESAF, 9 11 May 2018, pp. 443-452
6. Borowska, A. (2013). Local Food Systems and Short Chain Delivery of Regional Products as a Manifestation of Competitiveness in Rural Areas. [in:] *Creating competitiveness of Polish and Ukrainian rural areas*. ed. K. Krzyżanowska, Wydawnictwo SGGW, Warszawa, pp. 73-81
7. Geresz, J., Fiszer, D. (2015). Kulinarna pamiątka turystyczna (Culinary tourist souvenir). *Zeszyty Naukowe. Turystyka i Rekreacja* 1(15), pp. 29-51
8. Gulbicka, B. (2014). Żywność tradycyjna i regionalna w Polsce. (Traditional and regional food in Poland) *Konkurencyjność Polskiej Gospodarki Żywnościowej w Warunkach Globalizacji i Integracji Europejskiej*, nr 116, Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej, Warszawa
9. Jęczmyk, A., Sammel, A. (2012). Ochrona tradycyjnych produktów regionalnych jako czynnik rozwoju turystyki kulinarnej (The Culinary Tourism and the Need for the Protection of Traditional Regional Products). *Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 738. Ekonomiczne Problemy Turystyki*. 4 (20), Szczecin
10. Krupa, J. (2010). Dziedzictwo kulinarne elementem atrakcyjności turystycznej region (Culinary heritage as an element of tourism attractiveness of the region). *Problemy Ekologii i Krajobrazu*, t. XXVII, pp. 451-455
11. Matusiak, A. (2009). Kulinarne wojaże jako element turystyki kulturowej. Dziedzictwo kulinarne Górnego Śląska (Culinary trips as an element of cultural tourism. Culinary heritage of Upper Silesia). *Turystyka Kulturowa*. 2/2009, pp. 4-19
12. Montella, M. M. (2017). Wine Tourism and Sustainability: A Review. *Sustainability*, 9, 113; doi:10.3390/su9010113, pp. 1-11
13. Orłowski, D., Wozniczko, M. (2016). Turystyka kulinarna w Polsce- wstępne badania nad fenomenem zjawiska (Culinary tourism in Poland – preliminary research on the phenomenon). *Turystyka Kulturowa*, nr. 5/2016, pp. 60-100
14. Sieczko, A. (2017). Biroturystyka jako nowy trend turystyczny w Warszawie (Beer tourism as a new tourist trend in Warsaw). *Ekonomiczne Problemy Turystyki*, 2 (38), pp. 105-114
15. Smalec, A. (2014). Jarmarki jako forma promocji produktów tradycyjnych (Ethnic Fairs as a Form of Promotion of Traditional Products). *Problemy Zarządzania, Finansów i Marketingu* 35, pp. 253-266
16. Smalinskis, J., Auzina, A. (2017). Preconditions for Establishment and Historical Development Stages of Latvian Rural Tourism Association „Country Holidays”. Proceedings of the 2017 International Conference „ECONOMIC SCIENCE FOR RURAL DEVELOPMENT” No 45 Jelgava, LLU ESAF, 27-28 April 2017, pp. 221-227
17. Strategia Rozwoju Województwa Świętokrzyskiego do roku 2020. (Development Strategy of the Świętokrzyskie Voivodeship until 2020). Kielce, lipiec 2013r, www.e-swietokrzyskie.pl/ s. 18;
18. Szlachciuk, J., Bobola, A., Ozimek, I., Czyż E. (2017). Znajomość polskich produktów regionalnych i tradycyjnych wśród młodych konsumentów (The familiarity with Polish regional and traditional products among young consumers). *Ekonomiczne Problemy Turystyki* 3/2017 (39), pp 77-88, ISSN: 1644-0501
19. Szpara, K., Gwozdz, M. (2011). Zastosowanie nowoczesnych technologii w promocji turystyki kulinarnej na przykładzie terenów wiejskich województwa podkarpackiego (Application of modern technologies in the promotion of culinary tourism, on example of rural areas in the Podkarpacie Region). *Folia Pomeranea Universitatis Technologiae Stetinensis, Oeconomia* 286 (62), pp. 221-230
20. Turystyka w 2017 roku (Tourism in 2017), GUS, Warszawa, 2018 s. 27
21. Winfreea, J., McIntosha, Ch., Nadreau, T. (2018). An Economic Model of Wineries and Enotourism. *Wine Economics and Policy*, Volume 7, Issue 2, December 2018, pp 88-93
22. www.wrota-swietokrzyskie.pl (date of access 15.01.2019)
23. swietokrzyskie.ksow.pl (date of access 15.01.2019)
24. Zawadka, J. (2015a). Popyt agroturystyczny realizowany na Lubelszczyźnie i Podlasiu oraz jego charakterystyka (Agritourism demand implemented in the Lublin region and Podlasie region and its characteristics). [in:] *Gospodarstwa agroturystyczne i ekologiczne w Polsce*. Red. naukowa J. Brodny. Instytut Nauk Ekonomiczno-Technicznych w Legnicy, Legnica, pp. 23-31
25. Zawadka, J. (2015b). Opinie, preferencje, zachowania i oczekiwania turystyczne mieszkańców miast względem agroturystyki (Opinions, preferences, behaviors and tourist expectations of city residents in relation to agritourism). *Studia Komitetu Przestrzennego Zagospodarowania Kraju* 2015, vol. 162, pp. 139-153
26. Zawadka, J. (2018). The Motives, Preferences and Tourist Behavior of Poles Participating in Enotourism trips. *Acta Scientiarum Polonorum. Oeconomia*, No 17(2), pp. 153-162

BUSINESS VALUES AND MOTIVES OF IMMIGRANT AGRICULTURAL ENTREPRENEURS IN SWEDEN

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Abstract. The agri-food sector in Sweden, as in much of Europe, faces dramatic pressure to promote entrepreneurship, especially in rural areas where population aging and population decline pose grave economic threats to local communities. One solution is the government policy of supporting the entrepreneurial ambitions of newly arrived immigrants. The policy is seen as doubly beneficial: support for rural areas and support for immigrants not yet prepared to enter the regular workforce. Immigrant entrepreneurship seems to have the potential to lessen the harmful effects of current socio-economic challenges. This paper examines the immigrant entrepreneurship experience in the agri-food sector in Sweden. A qualitative research approach is used to evaluate interviews with 25 immigrant entrepreneurs on the various factors that motivated them to become self-employed entrepreneurs. The main factors are the lack of other employment opportunities, the desire for work autonomy and flexibility, and the chance for a better standard of living. The results show that personal characteristics and previous entrepreneurship experience are the best predictors of business success. The paper concludes with a call for a model for immigrant entrepreneurship and for more government reforms and policies aimed at supporting the immigrant entrepreneur.

Key words: Immigrant entrepreneurs, Agri-food sector, rural area, motivation factors, business value.

JEL code: available on: L26, Q10.

Introduction

The agricultural sector employs more than one billion people worldwide and accounts for 3 % of global GDP. According to the Food and Agricultural Organization of the United Nations, the sector requires increased investment, especially in new and improved technologies, if it is to maintain the worldwide food supply (FAO, 2018). Yet even rural areas in the wealthier countries in the European Union (EU) are at risk of socio-economic marginalization and desertification. For example, according to the Swedish Board of Agriculture, rural areas in Sweden have experienced substantial economic and demographic changes in the last three decades (*Jordbruksverket*, 2018; Hedlund and Lundholm, 2015).

Background

Agricultural entrepreneurship and the agricultural entrepreneur

A much-discussed subject among researchers, when the focus is on these challenges, is the concept of agricultural entrepreneurship (Lans et al., 2013; Vik and McElwee, 2011). What is agricultural entrepreneurship? Answers vary. Seuneke et al. (2013) relates the concept to the development of non-agricultural business by established, multifunctional farms. Other researchers point to the expansion of traditional agricultural activities to entrepreneurial activities such as new product development (e.g., organic farming and functional foods) and business innovations (e.g., distribution and marketing) (EIP-AGRI, 2016; Vik and McElwee, 2011). The theme running through these descriptions is that agricultural entrepreneurship is the process of founding new organizations or revitalizing older organizations by seizing market opportunities (Gries and Naude, 2011).

A related question is: What characteristics and values do agricultural entrepreneurs exhibit in their business activities? Again, answers vary. For example, in a study of entrepreneurial characteristics in European agricultural workers, Pindado and Sanchez (2017) found that while some agri-entrepreneurs have weaker entrepreneurial capabilities than non-agricultural entrepreneurs,

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new entrants (although not established agri-entrepreneurs) in the agricultural sector are just as entrepreneurial as their counterparts in other sectors.

Immigration and rural Europe

In 2017 many European countries granted protected status to numerous asylum seekers: Germany (325 400), France (40 600), Italy (35 100), Austria (34 000), and Sweden (31 200) (Eurostat, 2018). The expectation, and hope, was that many of these immigrants would supplement the domestic workforce (Findlay and McCollum, 2013; Nori, 2017), especially in rural areas challenged by population aging and population decline. Immigrant repopulation of the countryside is often viewed as „demographic refill” (Hedberg and Haandrikman, 2014) in the sense that new arrivals can contribute to economic development and redevelopment with their skills, their external networks, and their market connections (Carson et al., 2016; Eimermann, 2016; Hedberg et al., 2012).

Many immigrants also have a strong entrepreneurial spirit. Some research concludes that immigrants are even more likely to become entrepreneurs than native-born citizens (e.g., Irastorza and Pena, 2014). As Munkejor (2017) found in a study of rural entrepreneurship in Norway, if supported by their rural communities, immigrants may successfully create and exploit entrepreneurial opportunities, and, through the entrepreneurship processes, may help rebuild these communities. According to Chun and Watanbe (2012), the establishment of new businesses has a positive influence on employment and welfare in rural areas.

Immigration and rural Sweden

As noted above, Sweden has welcomed a large number of immigrants in recent years, most of whom are now concentrated in urban areas. Their integration into Swedish work and culture has been much studied. However, less is known about the immigrants who have settled in rural areas of Sweden, especially the immigrants who arrived in the last ten years as war refugees. More research is needed on how they have contributed to the Swedish agri-sector.

Research questions

In this paper, we examine the immigrant agricultural entrepreneur in Sweden. Our two questions are the following:

- Why do immigrants become entrepreneurs in the agri-food sector in Sweden?
- Which business values do immigrant entrepreneurs in the agri-food sector in Sweden support?

Methodology

We collected the data for this paper in interviews with immigrant agricultural entrepreneurs (asylum seekers) in various rural areas of Sweden. Taking a qualitative research approach, we sought to record and interpret the experiences of this group of entrepreneurs in order to understand why they became entrepreneurs and what their main business values are. We conducted 25 semi-structured, in-depth interviews in which our open-ended questions allowed us to depart from the interview guide when topics of interest arose spontaneously (Gill et al., 2008).

We used purposeful sampling to select the respondent candidates (Patton, 2002). Because the EU's General Data Protection Regulation prohibited us from searching immigrant records, we referred to local newspapers that had featured the success stories of agricultural immigrant entrepreneurs. We also used the snowball research strategy (Atkinson and Flint, 2001) with various social media and personal networks to identify possible respondents.

The 25 (21 men and 4 women) interviews were conducted in the autumn and winter of 2018 by telephone and in face-to-face workplace interviews. Each interview lasted from 30 to 60 minutes.

The interviews began by explaining the purpose of the research to the respondents. The interview guide consisted of a number of questions about each respondent's, background, education, family, previous work experience, and new work experience in the agri-food sector in Sweden. The interviews focused on the respondents' reasons for entering the agri-food sector and the business values most important to them. As necessary, the interview questions were adapted to specific respondent situations.

The interviews, which were tape-recorded, were primarily conducted in Arabic languages. The respondents felt more comfortable answering the questions in their first language (rather than Swedish). The interviewer also took notes during the interviews. After the interviews were transcribed, content analysis was used to interpret the texts. For this paper, the respondents' comments have been translated to English. Respondents' names are not used; the comments are numbered for internal identification.

Research results and discussion

We present our results and discussion pertaining to the agricultural entrepreneurs in four sections: Personal characteristics; previous entrepreneurship experience; Entrepreneurship motivation; and Business values in the agri-food business.

Personal characteristics

An immigrant entrepreneur is a business owner who works permanently in a foreign country and engages in profit-seeking activities characterized by economic innovation and organizational creativity (Vinogradov, 2011; Volery, 2007). There is considerable variation in how immigrants create and/or find work opportunities. How they respond to these opportunities also varies because of many influential factors. These factors include personal characteristics of age, education, previous work experience, work ambition, and, not least, the place where they settle (Storti, 2014). The respondents in this research, who came from Syria, Palestine, and Lebanon, had immigrated to Sweden as refugees seeking asylum. For them, entrepreneurship was an entry point to employment that offered them a chance to have a safe and stable life.

Table 1 lists data about the 25 respondents in this research. In their home countries, two respondents were teachers, one was an accountant, and three were engineers; these highly educated respondents also became agricultural entrepreneurs. The majority of the participants had less than 12 years of education in their home countries; only some had education related to the agri-food sector. None of the respondents, however, thought this lack of education or their education in an unrelated field was a barrier to their entrepreneurial performance. This conclusion is supported by Efendic et al. (2016), who studied native and immigrant CEOs of small firms.

Nineteen of the business are owned by men, one by a woman, and five by husband-wife or brother-sister teams. This distribution agrees with Williams and Krasniqi's (2017) finding that male immigrants are more likely than women to become entrepreneurs in their new country. Only two of the respondents are unmarried. With one exception, all the married entrepreneurs have children. Williams and Krasniqi also found that immigrants with children are attracted to entrepreneurship that they see as a way to provide financial security for the family.

One finding of particular interest is the respondents' language proficiency in Swedish. Only one respondent has a „High” level of knowledge of Swedish; the others are fairly evenly divided between „Low” (No knowledge of Swedish) and „Middle” (basic knowledge of Swedish). Many researchers have observed (e.g., Williams and Krasniqi, 2017; Yeasmin, 2016; Zheng, 2017) that immigrants' entrepreneurial success, in part, is influenced by their fluency in their new language. However, as our interviews revealed, even the respondents with little or No knowledge of Swedish, have exploited

entrepreneurial opportunities in the agri-food sector. It may be that other factors (previous experience in agriculture and/or entrepreneurship) are compensatory. It may also be that the agricultural entrepreneur does not need to know how to read and speak the official language of the new country.

Previous entrepreneurship experience

Many of the respondents had operated successful businesses in their home country. Starting a new business was not an especially challenging experience despite the very different business culture plus different laws, fiercer competition, and more bureaucratic regulations. Yet even the teachers, the accountant, the engineers, the florist, and the contractor launched businesses in which they had little work experience. As Baron and Markman (2000) found, business success is more likely when entrepreneurs, among other things, have relevant previous experience in the field of their endeavor. However, previous entrepreneurship experience could compensate for lack of work experience. Only six of the 25 respondents had No previous entrepreneurship experience. Possibly the two most successful entrepreneurs in the group were the two dairy farmers who export products abroad. Both have previous entrepreneurial experience.

The respondents realize that running a business in Sweden is quite different from running a business in their home countries. It is not just the jumping through the bureaucratic hoops (about which nearly all of them complained). It is also the realization that they need a clear vision if they are to develop their businesses. As Barth et al. (2017) conclude, they need to act as entrepreneurs rather as producers. For entrepreneurs to grow and develop, they need some level of knowledge of, and competence in, marketing and management. Many studies have addressed this need (e.g., Lans et al., 2010).

Entrepreneurship motivation

Table 2 presents the respondents' statements and reasons for starting their businesses. The main motivating factors can be summarized as follows: the lack of other employment opportunities, the desire for work autonomy and flexibility, and the chance for a better standard of living. The respondents also mention the importance of community and family support for their businesses. Some local communities and towns have set aside farm land for immigrants, and government agencies have provide financial support (e.g., Stathopoulou et al., 2004). A supportive family also facilitates business growth (e.g., Alsos et al., 2014).

The respondents emphasize they are interested in full-time employment at companies, but the language barrier and their inability to prove their experience and education are problematic. These are typical immigrant employment obstacles. However, as Federick and Foley (2006) found, self-employment can produce a renewed and positive sense of self-determination.

The respondents saw a self-employment opportunity when they spotted a niche market in the agri-food sector: traditional Middle Eastern food. To fill this niche, the immigrant entrepreneurs opened dairies, bakeries, and grocery stores. They cultivated fruits and vegetables used in Arabic dishes. However, some immigrant entrepreneurs have had to close their businesses mainly because they were unable to expand into the wider Swedish market.

Business values in the agri-food sector

Value in the agri-food sector refers to an increase in economic value as the result of improved product quality, safety, and customer appeal (see the agri-food chain as described by Humphrey and Memedovic, 2006). The agricultural entrepreneurs in this research play a special role in the agri-food value chain. They primarily aim to satisfy the demand for Middle Eastern food and other products as

well as to support their traditional cultures. A secondary aim is to expand their niche market into the broader Swedish agri-food market. The Arabic bread and cheese and the special vegetable crops, produced and grown in new ways, add value to the Swedish agri-food sector. The entrepreneurs have taken advantage of the opportunity for product differentiation (Bhattacharyya, 2006; Kampen, 2011). They have also recognized the importance of „value creation,“ in which new value is created when unique production characteristics are used with traditional resources (Anderson, 2000).

Table 1

Characteristics of immigrant entrepreneur

Nr	Age	Gender	Orig.	Family sit.	Nr. of child.	Educ. level*	Back-ground	Entr. Exp.	Est. year	Lang. **
1	34	Man	Syria	Single	-	High	Account.	No	2017	Low
2	39	Man	Syria	Married	4	High	Eng.teach	No	2017	Middle
3	51	Man	Syria	Married	3	Middle	Trade	Yes	2017	Middle
4	37	Man	Syria	Married	4	Low	Farmer	Yes	2018	Low
5	45	Woman	Syria	Married	6	Middle	Dairyman	Yes	-	Low
6	33	Man	Palest.	Married	5	High	Elec.eng.	No	2016	Middle
7	43	Man	Syria	Married	4	Middle	Florist	Yes	2016	Middle
8	57	Man	Palest.	Married	4	High	Art teach.	No	2010	High
9	36	Man	Syria	Married	7	Low	Farmer	Yes	2017	Low
10	42	Man	Syria	Married	-	High	Agri.eng.	No	2016	Middle
11	68	Man	Syria	Married	6	Middle	Farmer	Yes	2017	Low
12	40	Woman	Syria	Married	4	Middle	Food prod.	Yes	2017	Low
13	40	Man	Syria	Married	3	Middle	Trade	Yes	2018	Low
14	55	Man	Palest.	Married	5	High	Farmer	Yes	-	Middle
15	39	Man	Leban.	Married	2	High	Food prod.	Yes	-	High
16	45	Woman	Syria	Married	2	Middle	Food prod.	Yes	2017	Middle
17	53	Woman	Syria	Married	7	Low	Farmer	Yes	2018	Low
18	53	Man	Syria	Married	4	Middle	Contractor	Yes	2016	Low
19	58	Man	Syria	Married	4	High	Agri. Eng.	Yes	2018	Middle
20	26	Man	Syria	Married	1	High	Dairy man	Yes	-	Middle
21	48	Man	Syria	Married	3	Low	Farmer	Yes	-	Low
22	58	Man	Syria	Married	5	Low	Farmer	Yes	-	Low
23	53	Man	Syria	Married	6	Low	Farmer	Yes	-	Low
24	55	Man	Syria	Married	6	Low	Farmer	Yes	2018	Low
25	22	Man	Syria	Single	-	Middle	Student	No	2016	Middle

* Education level: Low – fewer than 12 years in school, Middle – 12 years in school, High - university study.

**Language ability: Low – only first language, Middle – basic knowledge in Swedish language, High – fluent in Swedish or/and more languages.

Table 2

The agricultural entrepreneurs: Business description and motivating factors

Brief description of the business	Illustrative statements/or reasons for starting a business
Manufacturing of soft bread and fresh pastries	A self-employed job is a good solution in a new country because it is hard to find a job as an employee. There is a need for Arabic bread in the market.
Cultivation of vegetables in greenhouses and outdoors	I miss the taste of my country's vegetables, the fresh ones.
Honey production	He has a honey production training course that motivates him in this business.
Cultivation different kinds of Syrian vegetables	This is simply his job and he likes it.
Dairy production; Arabic cheeses, Halomi cheeses, yoghurt, butter, cream.	We don't want to stay at home and do nothing. We don't want just to take aid from the government. We want to be independent... We also want a better life for our children.
Manufacture of dairy products.	„I have experience as a milk product producer. My friends encouraged me to start to start a business together. This was the start of my business.
Selling flower and plants. Organizing weddings and other events.	I could not find a job, and since I like working with flowers. I started a business.
Dairy production according to family recipe from Nablus City	The idea started when our children missed the special Nablus cheese from our home country... There is a need in the market.
Mushroom production. Special kinds of mushroom; Oyster mushroom.	I'm a farmer and I wanted to have the same job here... due to a water shortage in Gotland [a major region], I thought it would be a good idea to grow mushrooms. Mushrooms don't need as much water as vegetables.
Cultivation of various Syrian vegetables. Aquaponics project for kids.	I did not want to stay at home and do nothing... I'm an agriculture engineer, and I have many business ideas.
Cultivation of various Syrian vegetables	I have experiences in the agricultural field, and I think that business in the agriculture sector has a potential future... I want to be independent and do not like to be an employee."
Selling fresh meat, chicken, and fish. Serving different foods.	We do not want to be unemployment and live on financial support...we could not get work because of the language... We thought it would be easier if we started our own business.
Cafeteria offers creative ice cream, fruit salads, and pancakes.	We wanted to start a creative business...We have friends in Sweden who have been living here for a long time. They helped us to start our business.
Making a small agricultural tourist village with many kinds of vegetables, flowers, herbs, and fruit trees from Mediterranean cities.	I have been an entrepreneur for more than 30 years in many different countries.
Honey producing, exporting, and selling	I wanted to try the Swedish market as a first step, and then expand the business to Norway.
Food truck with different food dishes. Preparation of food for events and fairs.	We have experience in running a restaurant in Syria...The Syrian food is delicious. There is a demand from the Arabic and Swedish customers for this kind of food.
A farm with different kinds of vegetables; cucumbers, zucchini, tomatoes, watermelons, beans, etc.	It was just not possible to get a job... We had an idea and wanted to achieve something in this country.
A farm with different kinds of vegetables grown in five greenhouses.	„The municipality provided me with some land that I could use to grow and build greenhouses.
Grocery store	It was very difficult to find a job in the agriculture sector so I preferred to have my own business.
Dairy production	I started to work as an employee, but it was too hard... I also like to run my own business...I worked as a dairy manager for five years.
A farm with different kinds of vegetables.	It is easier in a new country to have your own business.
A Farm with a greenhouse.	The municipality provided me with a piece of land that I could use.
Renovating an old farm and growing vegetables.	A friend offered me a field to grow vegetables... I had previous experience.
A farm with different kinds of vegetables: zucchini, corn, beans, carrots. etc.	It is better to have your own business, compared to being employed... As an entrepreneur I have several options to develop a better future.
Importing and selling Halal meat and chicken.	Having your own company means you can develop opportunities and new things...There is a big demand for Arabic food.

Conclusions and recommendations

- 1) Personal characteristics and entrepreneurship experience are factors that most influence immigrant entrepreneurship performance.
- 2) Immigrants choose self-employment in the agri-food sector area for three main reasons: inability to find full-time employment, financial and other support, and prior employment experience.
- 3) Immigrant entrepreneurs strengthen a country's cultural and food diversity when they introduce new agri-food products. They strengthen economies by adding jobs and opening markets.
- 4) A development model is needed that can help immigrant entrepreneurs successfully run businesses and create job opportunities.
- 5) To support immigrant entrepreneurship, new government reforms and policies are needed.

Bibliography

1. Alsos, G. A., Carter, S., Ljunggren, E. (2014). Kinship and Business: How Entrepreneurial Households Facilitate Business Growth. *Entrepreneurship & Regional Development*, Volume 26, Issue 1-2, pp. 97-122.
2. Anderson, A.R. (2000). Paradox in the Periphery: An Entrepreneurial Reconstruction? *Entrepreneurship and Regional Development*. Volume 12, Issue 2, pp. 91-109.
3. Atkinson, R., Flint, J. (2001). Accessing Hidden and Hard-to-Reach Populations: Snowball Research Strategies. *Social Research Update*, Volume 33, pp. 1-5.
4. Barron, R., Markman, G. (2000). Beyond Social Capital: How Social Skills Can Enhance Entrepreneurs' success. *Academy of Management Executive*, Volume 14, Issue 1, pp. 106-116.
5. Barth, H., Ulvenblad, P-O., Ulvenblad, P. (2017). Towards a Conceptual Framework of Sustainable Business Model Innovation in the Agri-Food Sector: A Systematic Literature Review. *Sustainability*, 9, 1630.
6. Bhattacharyya, S. (2006). Entrepreneurship and Innovation: How Leadership Style Makes the Difference? *Vikalpa*. Volume 31, Issue 1, pp. 107-115
7. Carson, D. A., Cleary, J., de la Barre, S., Eimermann, M., Marjavaara, R. (2016). *New Mobilities-New Economies? Temporary Populations and Local Innovation Capacity in Sparsely Populated Areas. Settlements at the Edge: Remote Human Settlements in Developed Nations*. Cheltenham: Edward Elgar, Cheltenham. pp. 178-206.
8. Chun, N., M. Watanabe. (2012). Can Skill Diversification Improve Welfare in Rural Areas? Evidence from Bhutan. *Journal of Development Effectiveness*, Volume 4, Issue 2, pp. 214-234.
9. Eimermann, M. (2016). Two Sides of the Same Coin: Dutch Rural Tourism Entrepreneurs and Countryside capital in Sweden. *Rural Society*, Volume 25, Issue 2, pp. 55-73.
10. Efendic, N., Andersson, F. W., Wennberg, K. (2016). Growth in First- and Second-Generation Immigrant Firms in Sweden. *International Small Business Journal*, Volume 34, Issue 8, pp. 1028-1052.
11. EIP-AGRI. (2016). *Focus Group New Entrants into Farming Final Report. Resource Document*. European Commission.
12. Eurostat. (2018). Asylum Decisions in the EU: EU Member States Granted Protection to More than Half a Million Asylum Seekers in 2017: Almost One-Third of the Beneficiaries were Syrians. *Eurostat News Release*.
13. FAO. (2018). World Food and Agriculture - Statistical Pocketbook 2018. Rome. pp. 254
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14. Findlay, A., McCollum, D. (2013). Recruitment and Employment Regimes: Migrant Labour Channels in the UK's Rural Agribusiness Sector, from Accession to Recession. *Journal of Rural Studies*, Volume 30, pp. 10-19.
15. Frederick, H. H., Foley, D. (2006). Indigenous Populations as Disadvantaged Entrepreneurs in Australia and New Zealand. The International Indigenous Journal of Entrepreneurship, Advancement. *Strategy and Education*, Volume 1, Issue 1, pp. 1-16.
16. Gill, P., Stewart, K., Treasure, E., Chadwick, B. (2008). Methods of Data Collection in Qualitative Research. Interviews and Focus Groups. *British Dental Journal*, Volume 204, Issue 6, pp. 291-295.
17. Gries, T., Naude, W. (2011). Entrepreneurship and Human Development: A Capability Approach. *Journal of Public Economics*, Volume 95, Issue 3, pp. 216-224.
18. Hedberg, C., Forsberg G., Najib, A. (2012). When the World Goes Rural: Transnational Potentials of International Migration in Rural Swedish labour. *GeoJournal Library*, Volume 103, pp. 125-142
19. Hedberg, C., Haandrikman, K. (2014). Repopulation of the Swedish Countryside: Globalisation by International Migration. *Journal of Rural Studies*. Volume 34, pp. 128-138.
20. Hedlund M., Lundholm, E. (2015). Restructuring of Rural Sweden – Employment Transition and Out-Migration of Three Cohorts born 1945–1980. *Journal of Rural Studies*, Volume 42, pp. 123-132
21. Humphrey, J., Memedovic, O. (2006). (Working paper). Retrieved from United Nations *Global Value Chains in the Agri-food Sector* Industrial Development Organization website:

http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Global_value_chains_in_the_agrifood_sector.pdf

22. Irastorza, N., Pena, I. (2014). Earnings of Immigrants: Does Entrepreneurship Matter? *The Journal of Entrepreneurship*, Volume 23, Issue 1, pp. 35–56.
23. Jordbruksverket. (2018). *Sveriges officiella statistik*.
24. Kampen, K. (2011). *Financial Analysis of Three Value-Added Dairy Enterprises in Vermont, Wisconsin, and New York*. PhD thesis. San Louis Obispo, CA; California Polytechnic State University.
25. Lans, T., Biemans, H., Mulder, M., Verstegen, J. (2010). Self-Awareness of Mastery and Improvability of Entrepreneurial Competence in Small Businesses in the Agrifood Sector. *Human Resource Development Quarterly*, Volume 21, Issue 2, pp. 147–168.
26. Lans, T., Seunke, P., Klerkx, L. (2013). Agricultural Entrepreneurship. In E. G. Carayannis (Ed.), *Encyclopedia of Creativity, Invention, Innovation, and Entrepreneurship* (pp. 44– 49). Berlin, Heidelberg: Springer.
27. Munkejord, M. C. (2017). Becoming Spatially Embedded: Findings from a Study on Rural Immigrant Entrepreneurship in Norway. *Entrepreneurial Business and Economics Review*, Volume 5, Issue 1, pp. 111–130.
28. Nori, M. (2017). *The Shades of Green: Migrants' Contribution to EU Agriculture. Context, Trends, Opportunities, Challenges*. Florence, Migration Policy Centre.
29. Patton, M. Q. (2002). Two Decades of Developments in Qualitative Inquiry: A Personal, Experiential Perspective. *Qualitative Social Work*, Volume 1, Issue 3, pp. 261–283.
30. Pindado, E., Sanchez, M. (2017). Researching the Entrepreneurial Behaviour of New and Existing Ventures in European Agriculture. *Small Business Economics*, Volume 49, pp. 421–444.
31. Seunke, P., Lans, T., Wiskerke, J. S. (2013). Moving Beyond Entrepreneurial Skills: Key Factors Driving Entrepreneurial Learning in Multifunctional Agriculture. *Journal of Rural Studies*, Volume 32, pp. 208–219.
32. Stathopoulou, S., Psaltopoulos, D., Skuras, D. (2004). Rural Entrepreneurship in Europe. A Research Framework and Agenda. *Journal of Entrepreneurial Behaviour & Research*, Volume 10, Issue 6, pp. 404–425.
33. Storti, L. (2014). Being an Entrepreneur: Emergence and Structuring of Two Immigrant Entrepreneur Groups. *Entrepreneurship and Regional Development*, Volume 26, Issue 7–8, pp. 521–545.
34. Vik, J., McElwee, G. (2011). Diversification and the Entrepreneurial Motivations of Farmers in Norway. *Journal of Small Business Management*, Volume 49, Issue 3, pp. 390–410.
35. Vinogradov, E. (2011). Ethical Aspects of Research on Ethnic/Immigrant Entrepreneurship. *Entrepreneurship Research Journal*, Volume 1, Issue 3. doi:10.2202/2157-5665.1017
36. Volery, T. (2007). Ethnic Entrepreneurship. A Theoretical Framework. In L. P. Dana (Ed.). *Handbook of Research on Ethnic Minority Entrepreneurship: A Co-evolutionary View on Resource Management* (pp. 30–41). Northampton, MA: Edward Elgar Publishing.
37. Williams, N., Krasniqi, B. A. (2017). Coming Out of Conflict: How Migrant Entrepreneurs Utilise Human and Social Capital. *Journal of International Entrepreneurship*, Volume 16, Issue 2, pp. 301–323.
38. Yeasmin, N. (2016). The Determinants of Sustainable Entrepreneurship of Immigrants in Lapland: An Analysis of Theoretical Factors. *Entrepreneurial Business and Economics Review*, Volume 4, Issue 1, pp. 129–159.
39. Zheng, Y. (2017). *How Immigrants Invent: Evidence from Sweden*. Lund: Media-Tryck, Lund University.

AGRICULTURAL ADVISORY SERVICES IN THE PROCESS OF SHAPING ENTREPRENEURIAL ATTITUDES

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Abstract. The main aim of paper was to present the activities of agricultural advisory centres aimed at the encouragement of entrepreneurship and promotion of non-agricultural functions in the rural areas. The study involved the analysis of documents made available by the Ministry of Agriculture and Rural Development regarding the activity of agricultural advisory units in 2017 and mass statistics data provided by the Central Statistical Office. The basic tasks of agricultural advisory centres aimed at improving the competitiveness of the Polish agricultural sector, enhancing the quality of life in rural areas and improving professional qualifications of rural residents in Poland. Under the Common Agricultural Policy for 2014-2020, special measures have been taken to encourage farmers to set up their own business. The most important activities, also shaping entrepreneurial attitudes, aimed to support the development of small family businesses in the fields of agritourism, rural tourism, educational farms, small-scale on-farm processing and marketing of the manufactured products through short distribution chains (e.g. in the form of marginal limited local business), agricultural retail trade as well as direct sales and direct deliveries including labelling of packaged food.

Key words: entrepreneurship, agricultural advisory services, entrepreneurial attitudes.

JEL code: R11.

Introduction

Entrepreneurship is one of the economic and social categories, which constitutes a key element under all political conditions, both domestic and international, and at every stage of civilization and economic development of a given society (Bienkowska W., 2013). In economic terms, entrepreneurship is perceived as the drive to search for and implement new forms of development which can contribute to the quality of life of particular social groups (e.g. farmers), civilization progress, and increase in affluence of individuals or change in social status. Thus, the economic growth of rural areas is closely related to the development of various forms of entrepreneurship both in the individual and collective dimension (Parzonko A. J. Sieczko A., 2018). The concept of collective entrepreneurship can be understood as organized, conscious and voluntary cooperation of people focused on the achievement of a common goal, e.g. thanks to the pooling of funds, reduction of production costs (effect of scale and scope), increase of the impact on the market (increase in market share) (Parzonko A. J., 2012). Therefore, the interrelations of economic processes and phenomena that may affect entrepreneurs seem to be important, and at the same time contribute to increased diversity of products and services provided by them (Golasa P., 2013).

A. P. Wiatrak argues that „entrepreneurship can be treated as an attitude or as a process of changes resulting from this attitude”. According to him, entrepreneurship as an attitude is a feature characteristic of human individuals, expressing itself in creative and active behaviour towards the surrounding reality focusing on improving the existing elements of the environment. It manifests itself in undertaking new activities or expanding the existing ones and aiming to achieve the assumed material benefits (Wiatrak A., 1998). Therefore, in order to encourage entrepreneurship a group of certain traits should be formed through appropriate upbringing or education, which will facilitate the undertaking of various entrepreneurial activities. According to Gibb (Gibb A. A., 1993) these features include: initiative, persuasiveness, rather moderate than high tolerance to risk, flexibility, creativity,

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independence/autonomy, problem-solving ability, need for achievement, imagination, belief in one's control of one's own destiny, leadership and the ability to work hard. Considering the entrepreneurial attitudes of Polish individual farmers in the historical context, one can identify a group of characteristic features typical of this social group, i.e.: diligence, thriftiness, resourcefulness, aversion to coercion (that is, love of individual freedom) and independence (Styk J., 1998). These features predisposed farmers to actively cope with new socio-economic changes in Central Europe after 1989, which at that time led to the impoverishment of rural families and an increase in both official and hidden unemployment (Rak A., Multan E., 2015). Undertaking attempts to reduce unemployment or increase income from agricultural activity, part of individual farmers in the 90s of the twentieth century decided to expand agricultural activities with services closely related to agriculture like food processing or agritourism (Balinska A., Zawadka J., 2013). Others diversified out of agriculture to create enterprises operating in rural areas.

When it comes to shaping and supporting entrepreneurial attitudes towards creativity and innovation Polish farmers owe a lot to agricultural advisory centres. These units did not only shape entrepreneurial attitudes among farmers, but also undertook actions to increase agricultural income, improve the market competitiveness of farms, support sustainable rural development and improve professional qualifications of farmers and other rural residents (Journal of Laws of 2013, item 474). The advisory centres had considerable merit in encouraging farmers to set up their own business. It resulted from the Common Agricultural Policy for 2014-2020, where the development of entrepreneurship was the main priority in multifunctional rural development but also the response to unfavourable demographic processes: aging and disappearance of rural areas and migration of rural population to cities (Parzonko A. J., 2013). Institutional support for rural entrepreneurship alongside economic, cultural and environmental factors may contribute to its development or constitute a development barrier (Skubiak B., 2015).

To sum up, the term entrepreneurship refers to both economic activity and other forms of human activity, where creativity, initiative, and simply entrepreneurship are required. Entrepreneurship is conditioned by personality factors (such as personality traits, professional competences and motivation), social factors (e.g. social acceptance and recognition for such behaviour) or economic factors (financial possibilities, institutional support, etc.). In order to release the potential necessary for entrepreneurial activities it is necessary to foster knowledge transfer in the field of management, marketing, economics, finances or computer skills, always with an emphasis on gaining practical skills (Sieczko A., Parzonko A. J., 2017). Entrepreneurship becomes a „way of life“ for all participants of the market economy, both households and business units. It is the market that enforces this situation, becoming a natural creator of entrepreneurial behaviour in the market economy (Bienkowska-Golasa W., 2015).

The main aim of paper was to present activities of agricultural advisory centres aimed at the development of entrepreneurship and non-agricultural functions in the rural areas. The research task was to analyze documents made available by the Ministry of Agriculture and Rural Development regarding the activity of agricultural advisory units in 2017 and mass statistics data provided by the Central Statistical Office. Additionally, the study includes the review of literature on economic and social conditions of entrepreneurship in rural areas.

Research results and discussion

The activity of agricultural advisory centres is mainly focused on increasing the competitiveness of the Polish agricultural sector, enhancing the quality of life in the rural areas, and improving the professional qualifications of rural residents in Poland. The objectives set by individual advisory centres resulted from the development strategies drawn up for particular regions, the programs for the development of agriculture and rural areas as well as the current needs and expectations of the local community. Advisory services are flexible; they adapt to new challenges and play an important role in the transformation of rural areas and agriculture.

Pursuant to the Act on Agricultural Advisory Units, the establishment of agricultural advisory centres was aimed at providing assistance to farmers and residents of rural areas, primarily through free-of-charge activities as well as commercial ventures (Journal of Laws no. 251, item 2507). The objectives that agricultural advisory centres implemented in 2017 included inter alia: raising awareness in the field of bio security, healthy food and renewable energy sources, ensuring the greatest possible participation of farmers in new programmes proposed under the Rural Development Program 2014-2020, encouraging entrepreneurship in rural areas – on-farm processing and direct sales, improvement of the quality of life of rural residents, fostering knowledge transfer and innovation, improving the competitiveness of farms, popularization of integrated production methods, implementation of good agricultural practices, proposing the best technological, organizational and economic solutions on farms, raising ecological awareness, popularizing a healthy lifestyle, preserving cultural heritage, popularizing group activities in rural areas and the activation of the rural community.

Table 1

Selected data regarding the operations of Agricultural Advisory Centres in 2017

Agricultural Advisory Centre (AAC) by voivodeship	Number of staff employed by AAC	Number of staff employed as field advisors	Number of farms per one field advisor	Number of trainings provided in 2017
Dolnoslaskie	239	189 (163)	343	1326
Kujawsko – pomorskie	259	186 (121)	527	1199
Lubelskie	327	289 (231)	779	1200
Lubuskie	131	79 (56)	361	326
Lodzkie	257	208 (156)	795	1459
Malopolskie	199	174 (145)	964	711
Mazowieckie	542	316 (291)	731	1854
Opolskie	108	83 (54)	490	387
Podkarpackie	302	247 (199)	667	1463
Podlaskie	213	180 (145)	560	874
Pomorskie	208	174 (98)	398	515
Slaskie	181	133 (97)	562	900
Swietokrzyskie	193	139 (93)	917	973
Warminsko-mazurskie	179	147 (112)	385	776
Wielkopolskie	359	316 (262)	462	3303
Zachodniopomorskie	181	145 (100)	296	1237
Total	3878	3005 (2323)	607	18503

Source: Ministry of Agriculture and Rural Development and Central Statistical Office

Table 1 presents key numerical data characterizing the farm advisory system in Poland. In 2017, 3005 people were employed in agricultural advisory centres in positions of advisors, of which 2,323 people were employed as a field advisor who is responsible for providing advisory services

directly in the field. As can be seen from the data included in Table 1 in Poland, there are on average 607 farms for one field advisor. Shortage in manpower motivates the staff to look for alternative (other than individual consultation) ways of providing rural residents with support and information. The most popular form of providing advice in the last decades has become training, thanks to which it is possible to transfer knowledge to larger recipient groups. The trainings provided by agricultural advisory centres are addressed to farmers and residents of rural areas. At the same time, special attention is paid to tailor the educational offer to the expectations of the recipients of services. In 2017 the number of trainings provided nationwide was 18503.

Agricultural advisory centres as business support institutions served the existing and potential entrepreneurs by providing advice on setting up a business, gaining or upgrading employees' qualifications, creating new jobs, cost rationalization, etc. It is even more important that rural areas in most regions of Poland are characterized by large and insufficiently used manpower resources, also in agriculture, with a low profitability for rural residents. The development of entrepreneurship and increasing investment attractiveness is a way to enhance economic activity in the countryside and create additional sources of income. One of the priority areas defined by the Ministry of Agriculture and Rural Development is encouraging entrepreneurship and developing non-agricultural functions of the rural areas, including:

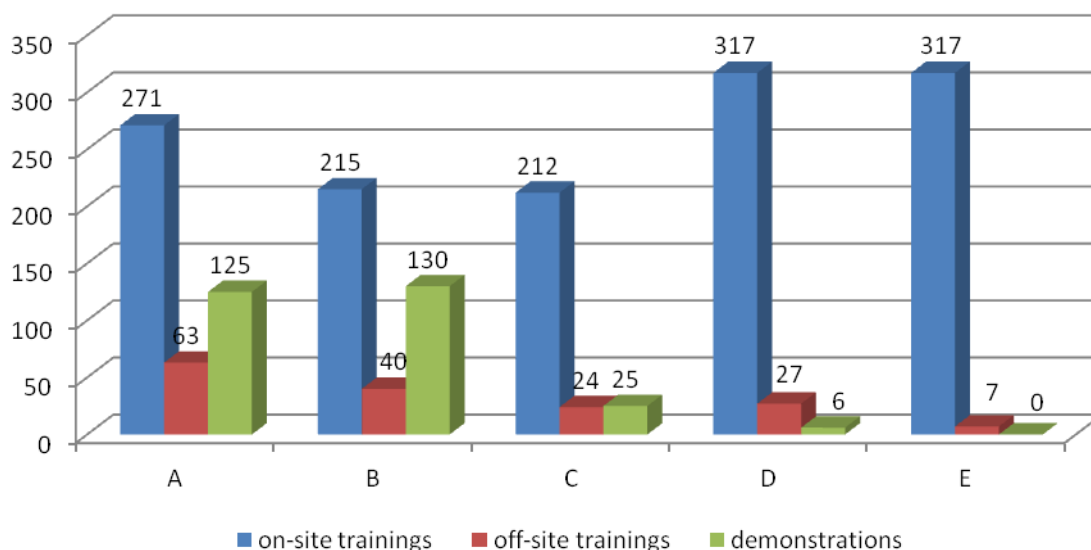
- A - support for farmers in undertaking and developing non-agricultural activities,
- B - promotion of regional and local products and quality systems,
- C - transfer of knowledge concerning small-scale food production and marketing of food products in short distribution chains, including information about marginal, local and limited business activity, agricultural retail trade and direct selling,
- D - providing information on the possibilities of rural development with the use of EU funds,
- E - promoting agricultural producer groups and their associations, producer organizations and their associations as well as inter-branch organizations (with particular emphasis on the cooperative form).

In Figures 1 and 2 and Table 2 included in the paper, priority actions have been marked accordingly.

Depending on the needs of farmers and residents of rural areas, agricultural advice (unpaid and paid tasks) was provided through various forms and methods, including: on-site and off-site trainings, conferences, shows, contests, consultations and demonstrations.

Figure 1 shows the number of on-site trainings, off-site trainings and demonstrations delivered in the priority areas. These are forms and methods of advisory work used by advisors to transfer knowledge and information necessary for effective functioning in the socio-economic environment, which also contributes to effective shaping the entrepreneurial attitudes of rural residents.

The support of farmers in diversifying into non-agricultural activities (A) most often took the form of assistance in the process of making the most economically justified decisions by preparing economic analyses of farm viability and farm production, which in consequence resulted in recommendations regarding favourable professional reorientation or improving professional qualifications. In this area, 26 333 consultations were provided and 271 on-site trainings as well as 63 off-site trainings were organized, in which 5853 people participated in total. Additionally, 125 demonstrations were performed.



* priority actions have been marked accordingly A, B, C, D i E.

Source: Annual reports on the operations of Agricultural Advisory Centres for 2017

Fig. 1. Number of on-site trainings, off-site trainings and demonstrations organized by agricultural advisory centres in 2017

One of the ways to implement the quality policy is granting signs confirming the high quality of agri-food products from specific regions, as well as those manufactured with the use of a traditional production method. In order to promote regional and local products and quality certification (B) 255 trainings were organized (40 of them were off-site trainings) as well as 130 shows and tastings. They aimed at rising consumers' awareness of the impact of food on health and quality of life and stimulating their interest in high quality products. Promotion and popularization of such food products creates the opportunity to sell and buy the sought after high quality products, but is also an important element of regional development.

Another area which agricultural advisors focused on was spreading knowledge about small-scale food processing and marketing the food products through short distribution chains, including the subject of marginal, local and limited business activity, agricultural retail trade and direct sales (C). Each poviats agricultural advisory team employs advisors for rural households and agritourism, whose main tasks in 2017 were not only to provide information on regional and local products, but also small-scale production of food and marketing it (in total 15311 consultations were held in this area). Additionally, 236 trainings were provided to inform farmers about legal regulations as well as amended definitions referring to the farmers' ability to sell their food, in which 3,544 people participated. These trainings covered such topics as: direct deliveries, direct sales, marginal, local and limited business activities as well as agricultural retail trade, including issues related to the labelling of packaged food intended for the consumer. Also, special activities were undertaken to promote local products by organizing 25 demonstrations and tastings during trade fair and exhibition events. The production, protection and promotion of high-quality food play an increasingly important role in the EU.

The availability of information on rural development opportunities with the use of EU funds (D) is very important for shaping entrepreneurial attitudes and decision making. Information has become one of the indispensable commodities nowadays and that is why accessing and using appropriate sources is so important (Jaska E., Werenowska A., 2018). This applies to every area of socio-economic life, including agriculture and rural residents. The advisors focused particularly on such

issues as supporting and promotion of agritourism farms or the creation and development of thematic villages. In this area, 354 trainings were delivered to approximately 5658 people and 35132 consultations).

Promotional activity related to the organization and functioning of agricultural producer groups was carried out through extensive information spreading activities (approximately 35132 consultations) and training (324 trainings for 5972 people) concerning the functioning of agricultural producer groups. They were aimed to show the need and possibilities for farmers' integration, inform about the support for producer groups available under Rural Development Policy 2014-2020, and thus encourage integration. Advisory services were also aimed at showing the benefits of cooperation, providing assistance in organizing founding meetings, setting goals for the group's activities, developing action programs and establishing contacts with other producer organizations in order to understand the specificity of the group's operation.

Table 2

Forms and methods of advisory services provided in 2017 in the area of rural entrepreneurship

Priority		A	B	C	D	E
training	Number of events	271	215	212	317	317
	Number of participants	3993	3285	3323	5116	5828
conference	Number of events	11	9	7	13	10
	Number of participants	729	451	487	745	557
off-site training	Number of events	63	40	24	27	7
	Number of participants	1860	997	221	542	144
consultation	Number of participants	26 333	17 772	15311	35132	18897
contest	Number of events	92	29	1	6	-
demonstration	Number of events	125	130	25	6	-

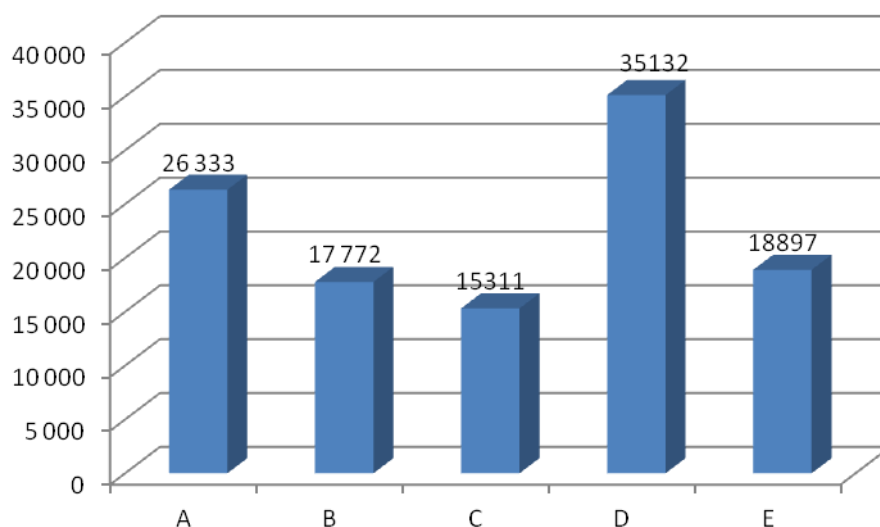
* priority actions have been marked accordingly A, B, C, D i E.

Source: Annual reports on the operations of Agricultural Advisory Centres for 2017

Advisors are involved in the organization of many fairs and exhibition events on a regional and national scale which promote agricultural activity as well address issues in the field of ecology, entrepreneurship and cultivating tradition. In the process of shaping entrepreneurial attitudes, activities such as organized contests, in which both knowledge and skills can be demonstrated, play an important role. The main purpose of these advisory methods is to shape the competitive attitude in achieving better and better results as well as active attitude in the search for new knowledge and information. Social benefits are also important, such as the increase in the prestige of people participating in such initiatives in the social environment or a boost to their self-esteem. The data presented in Table 2, show that most contests topics focused on non-agricultural sources of earning (92 contests) and local and regional products (29).

The increase in the level and quality of agricultural production and the functioning of agricultural holdings was supported by publishing activities. Each provincial agricultural advisory centre published

monthlies, brochures, leaflets and information materials on a regular basis. The publications informed about changes in legal regulations and innovative solutions in agricultural production and in rural areas.



* priority actions have been marked accordingly A, B, C, D i E.

Source: Annual reports on the operations of Agricultural Advisory Centres for 2017

Fig. 2. Individual consulting by priority tasks (number of provided consultations)

The form of advisory services which is considered most effective is individual consultation, the basis of which is one to one cooperation between a consultant and an individual seeking advice. It allows the adviser to become involved in one person's situation and analyse it in depth. In 2017, advisors provided a total of 113445 individual consultations. Their expert advice mainly concerned issues related to setting up and expanding business activities as well as company development concepts with particular focus on the possibility of obtaining funds and available sources of funds for business investments, both for existing enterprises and for start-ups.

Conclusions, proposals, recommendations

- 1) Despite insufficient manpower agricultural advisory centres have the trust of the rural population, which was visible in the number of forms of support provided to farmers regarding setting up and development of non-agricultural activities, i.e. 26 333 consultations, 334 trainings which in 2017 involved 5853 people .
- 2) The most important actions aimed at encouraging entrepreneurship and shaping entrepreneurial attitudes included support to the development of small family businesses in the areas of: agritourism and rural tourism, educational farms, on-farm processing on a small scale and marketing the products, short supply chains, agricultural retail trade as well as direct sales and direct deliveries including labelling of packaged food.
- 3) Appropriate funding should be secured for agricultural advisory centres to ensure the continuation of their activities to encourage rural entrepreneurship and shape entrepreneurial attitudes.

Bibliography

1. Balinska, A., Zawadka, J.(2013). Znaczenie agroturystyki w rozwoju obszarow wiejskich (The Role of Agritourism in Rural Development). *Ekonomika i Organizacja Gospodarki Zywnosciowej. Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie* No 102, pp. 127-144.
2. Bienkowska, W. (2013). Activities of Local Authorities in Promoting Entrepreneurship in Poland. *Economic Science for Rural Development. Jelgava: Issue: 32*, p. 27.

3. Bienkowska-Glasa, W. (2015). Entrepreneurship and Trends in Development of Rural Communes in Poland. *Economic Science for Rural Development*. Jelgava: Issue: 39, p. 108.
4. Gibb A.A. (1993). Enterprise Culture and Education: Understanding Enterprise Education and its Links with Small Business, Entrepreneurship and Wider Educational Goals. *International Small Business Journal*", Vol. 11, No.3, pp. 13-34.
5. Dziennik Ustaw Rzeczypospolitej Polskiej z dnia 19 kwietnia 2013 r, poz. 474 w sprawie ogłoszenia jednolitego tekstu ustawy o jednostkach doradztwa rolniczego (Journal of Laws of the Republic of Poland of April 19, 2013, item 474 Regarding the Publication of a Uniform Text of the Act on Agricultural Advisory Units).
6. 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.
7. Jaska, E., Werenowska A. (2018). The Availability and Use of Media Information Sources in Rural Areas. *Economic Science for Rural Development*. Jelgava: Issue: 47, p. 115.
8. Parzonko, A.J. (2012). Role of Leadership in Development of Group Enterprise. Proceedings of the International Conference on Management of Human Resources 2012, Management - Leadership - Strategy - Competitiveness: Godollo Hungary 14-15 June: Vol. 1, pp. 249-251.
9. Parzonko, A. J. (2013). Funkcjonowanie obszarów wiejskich w warunkach depopulacji (Functioning of Rural Areas Under Depopulation Conditions), (In:) Budowanie konkurencyjności obszarów wiejskich [Building Competitiveness of Rural Areas], Krzyzanowska, K., (Ed.). Warszawa: Wydawnictwo SGGW, pp. 9-18.
10. Parzonko, A.J., Sieczko, A. (2018). Agricultural Producer Groups as Manifestation of Team Entrepreneurship in Poland. *Economic Science for Rural Development*. Jelgava: Issue: 47, pp. 221-228.
11. Rak, A, Multan, E. (2015). Przedsiębiorczość rolników indywidualnych w Polsce – stan i kierunki rozwoju. (Entrepreneurship of Individual Farmers in Poland - Current State and Directions of Development). Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach. Seria Administracja i Zarządzanie No 107, p.176.
12. Sieczko, A., Parzonko, A.J. (2017). Przedsiębiorczość pozarolnicza na obszarach wiejskich w województwie mazowieckim. (Non-Agricultural Entrepreneurship in Rural Areas in the Masovia Province). *Zagadnienia Doradztwa Rolniczego* No 1'17 (87), p. 46.
13. Skubiak, B. (2015). Czynniki i bariery rozwoju przedsiębiorczości na obszarach wiejskich. (Factors and Barriers to Entrepreneurship Development in Rural Areas). *Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania, Uniwersytet Szczeciński*, Nr 42, T.2, pp. 99-107.
14. Styk J. (1998). Chłopski świat wartości (Peasant World of Values), (In:) Socjologia wsi. Wybor tekstów i literatury socjologicznej. (Sociology of the Village. Selection of Sociological Texts and Literature), Zych R., (Ed.) Rzeszów: Wydawnictwo Wyższej Szkoły Pedagogicznej, pp. 107-109.
15. Ustawa z dnia 22 października 2004 r. o jednostkach doradztwa rolniczego (Dz. U. z 2004 r. Nr 251, poz. 2507, z późn. zmianami). (Act of 22 October 2004 on Units of Agricultural Counselling. Journal of Laws no. 251, item 2507 as amended).
16. Wiatrak, A.P. (1998). Przedsiębiorczość w strategii rozwoju gmin (Entrepreneurship in the Municipal Development Strategy), (In:) Agrobiznes w krajach Europy Środkowej w aspekcie integracji z Unią Europejską (Agribusiness in the Countries of Central Europe in the Aspect of Integration with the European Union). Urban, S. (Ed.). Wrocław: Wydawnictwo Akademii Ekonomicznej we Wrocławiu, p. 520.

TOURISM COMPETITIVENESS OF POLAND COMPARED WITH OTHER EUROPEAN COUNTRIES

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Abstract. The article deals with the issues of Poland's tourism competitiveness and the role of rural tourism development. The study reveals that tourism can be an important area of the local economy and act as a stimulus of endogenous development. To assess the competitiveness of tourism regions in the Europe, the authors used the TTCI (Travel & Tourism Competitiveness Index) covering the period from 2015 to 2017. The aim of the research was focused on the evaluation of Poland's tourism competitiveness compared with other European countries. The analysis of TTCI data reveals that Poland's tourism competitiveness shows a positive trend. In the analysed period, the most competitive countries were Spain, France, Germany and the United Kingdom and the closest competitors of Poland were Hungary, Bulgaria, Slovakia and Latvia. The deeper insights in comparing the attractiveness of Poland compared with other East European and Balkan countries give evidence that the nature and landscape values of agricultural land of Poland are very highly rated in Europe, and the only Poland's indicator which stands out from the overall tourism indicators is country's international openness, which in reality is only indirectly linked with Poland's nature and landscape attractiveness as it mainly depends on the EU geopolitical aspects. The research is based on the analysis of qualitative and quantitative data available in secondary information sources; the methods of induction and deduction, analysis and synthesis are used to reach the aim of the research.

Key words: tourism economy, rural tourism, competitiveness.

JEL code: Z30, Z32.

Introduction

Nowadays the process of diversifying economic activity in rural areas and incorporating new non-agricultural and non-productive functions into the rural space is inevitable. The process is closely associated with the policies of the all-in-one and sustainable development of villages and the dominant feature of the tourist³. Based on research and expertise (Rosner, 2002; Stanny, 2013; Rosner, Stanny 2007), Polish countryside is spatially differentiated, both in the sense of the level of social and economic development. The country is divided into Western Poland, which is much better developed, and Eastern Poland with low economic potential and unfavourable demographic structures, with young people having a tendency to migrate - their escape to large economic centres for work and better living conditions. This situation forces us to seek new solutions to this problem and to commence the vocational activation of the rural population, with a particular focus on multi-functionality and creating non-agricultural jobs (Zarebski, 2015). According to Zvirbule and Dobeles (2018), the tourism industry represents one of the opportunities for economic growth in the country. As the examples of delimitation of rural areas indicate, tourism can be a crucial sector of the local economy and act as a stimulus of endogenous development. On the basis of the concept of alternative tourism (in the 80s of the 20th century put forth as an alternative to mass tourism), concepts pointing to the need for the development of tourism with respect to the broader human environment emerged. The concept of eco-development and then sustainable development takes into account the possibility

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³ Analysis of the development of tourist function usually applies to a limited area being a properly defined territory. This is usually an area defined by the administrative division (commune, poviat, voivodship). Larger (indivisible) areas of research, such as the countries or groups of countries are not common. The main reason is the small significance of such comparisons for the economy of a single country. However, when such a comparison is an element enabling the classification of countries due to the degree of tourist development, and therefore is a tool to indicate the countries most developed in terms of tourism, then this information becomes valuable due to the possibility of obtaining an appropriate pattern of development. Measurement of the development of the tourist function is carried out by using several indicators, among which should be mentioned best known traditional indicators, i.e.: Baretje'a-Deferta, Schneider, Charvata or Deferta [https://www.ue.katowice.pl/fileadmin/_migrated/content_uploads/8_A.R.Szromek_Pomiar_Funkcji_Turystycznej....pdf].

of natural „ingrowing“ of tourism into regional and local social structures and the natural environment (Kraciuk, 2016). This increases the importance of knowledge, innovation, creativity and entrepreneurship. These features become important factors in the development of both businesses, farms, local environments, regions, and the entire country's economy. The key task is shaping entrepreneurial attitudes, the consequence of which are specific activities in various spheres of social and economic life (Krzyzanowska, Sikorska-Wolak, 2010, p. 39). According to Wilkin (Multi-functionality of agriculture..., 2010) multifunctional use of resources of social capital and the implementation of new non-agricultural features into the rural space, such as production, services and commerce, result in economic diversification of rural areas, reducing the role of agriculture, and thus creating new jobs, reducing unemployment, searching for new sources of income in occupations related to the agriculture and using rural manufacturing resources (Roszkowska-Wise 2010, 2014, p. 113-126; Wisniewska, 2008, p. 221-225; Zawadzki, 2014, p. 315-329). Rural tourism has a huge potential owing to natural and heritage culture potential (Grinberga-Zalite et al., 2018), thus the resources of a given area: natural and cultural environment, infrastructure, facilities and equipment for visitors are a determinant of the attractiveness of the region. A tourist attraction is not only determined by its tourist values (natural and cultural), but also travel products offered, land use, the availability of physical and economic, historical heritage, social and cultural events as well as sports facilities (Davidson, 1996; Gaworecki, 2000).

How to extract tourist regions¹ is not clear, as different concepts on this topic appear in the literature of the subject. The indisputable criterion, taken into account by all the authors, is tourist attractions; however, in case of other features which should characterise this type of region, there is no longer such a compliance required. One of the older concepts assumes that the tourist region is an area that performs tourist function on the basis of homogeneity of the features of geographical environment and internal service links. It is a recognition of the economic existence of spatial organisation in the system with the team-oriented devices adapted to the environmental conditions and social relations (Warszynska, Jackowski, 1974, p. 31). In this perspective, a tourist region was identified with the administration, which became the economic specialization of functions, and it was usually characterised by the uneven distribution of values of geographical environment.

Tourism competitiveness of Poland in relation to other European countries

The competitiveness² of the areas of the tourist reception is based on three groups of objective and subjective variables: factors of the location of the area; the tourist potential; and assessing the image of the area (Zemla, 2010). Despite the fact that competitiveness is the subject of numerous scientific research works, the literature of the subject lacks a clear and generally accepted definition of that concept. There is a consensus, however, that competitiveness is a complex category, and consequently, determining its essence requires decomposition into constituent elements, i.e. dimensions of competitiveness. In literature, the competitiveness of a region is defined as the ability to adapt to new tasks and social, economic and environmental challenges, and the ability to create alternative conditions (possibilities) of the development, which help to maintain or strengthen the position of the region, both at home and abroad (Markowski, 2005, p. 25; Ratajczak, 2008, p. 300).

¹ Tourist region (destination) is defined as the area that attracts the attention of tourists from a considerable distance through its points of interest, providing them with paid accommodation.

² Economic literature indicates that the competition is the process by which market participants, in order to realize their interests, try to present more favourable offers in terms of price, quality or other characteristics affecting the decision to enter into a transaction (Kamerschen, McKenzie, Nardinelli 1992, p. 47). The competitiveness of national economies will therefore be the ability of the country to produce and distribute the material goods and intangible goods competitive in relation to those that are produced in other countries, assuming the increasing standard of living of societies (Scott 1985).

The competitive region is the one that creates a favourable climate for the development of entrepreneurship and innovation in the market economy, enabling businesses to achieve high economic efficiency and acts on the inclusion of existing work in the processes of management, thanks to which it raises the level and the quality of life in the region (Skinny-Hyski, 2009, p. 35). This approach refers to the concept of tourist attractiveness of areas and includes a group of features related to tourism in the broad sense, which is the subject of interest (demand) of potential tourists. The competitive region, according to Klamut M. (2008, p. 47) is the one which enables creating new structural combinations by using human and physical resources, favouring the commercialisation of its products. Competitive regions, according to Czudec W. (2010, p. 1), are separate or uniform areas similar in terms of investment offers or specialized public services, agricultural regions with similar specialization, industrial and raw material regions, tourist regions with similar offers, and finally innovative and learning regions. Factors shaping the competitiveness of the region depend mainly on the potential inherent in the region (natural or historical conditions), the activity of the local authorities in the area of planning and implementation of regional and economic policy of the country, structural policy and cohesion policy of the European Union (Richter-Kazmierska, 2007, p. 195-196). Taking into account the site factors in space, internal factors (e.g. the position, territorial organization factors, and infrastructure) are considered, i.e. permanent part of the region, and the external factors, which have been retrieved from outside the region (Grabowski, 2008, p. 157). The rivalry between the regions is now becoming more and more sophisticated. The areas which are winning are those that prioritise new management methods and are able to bring out their potential (Czudec, 2010, p. 1). The subject of competition between regions may be the acquisition of tourists, and the competitiveness in this case is based on attractive natural resources and cultural heritage and their respective exposure and use. The role that the region can play in the economy, whether Polish or European, depends on its competitive position. The potential of competitiveness determines the type, the size and persistence of competitive advantage. Competitive advantage is the basis for the formulation of such an offer in the market, which will allow the achievement of a specific position.

In the market of tourist services, small units such as a commune, and even a single tourist attraction, compete with each other. The development of competition in the market of tourist services both local, regional, internal, European, and global forces the subjects to the market to search for new forms of shaping their competitiveness (Dabrowska, 2006, p. 114).

The **aim** of the current research was focused on the evaluation of Poland's tourism competitiveness compared with other European countries. The **research tasks** subordinated to the achievement of the current research aim were: 1) to analyse the theoretical aspects of tourism economics and the growing importance of rural tourism opportunities for countries' regional development; 2) to analyse tourism competitiveness of European countries in 2015-2017; 3) to evaluate Poland's tourism competitiveness compared with other East European and Balkan countries by identifying its current strength and weaknesses.

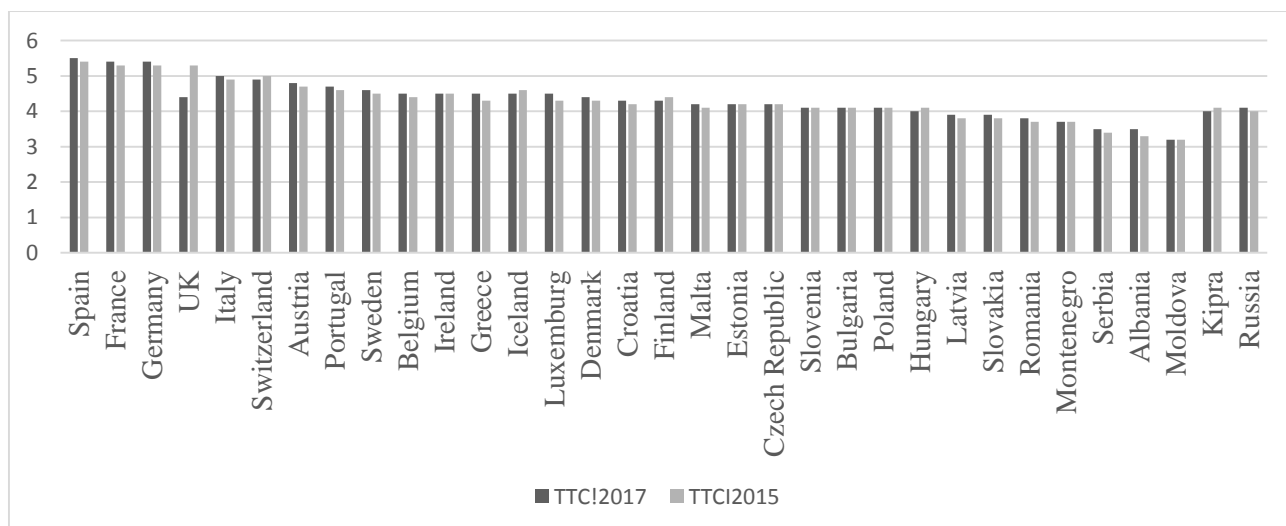
Methodology

In order to assess the specificity of the tourism economy and the competitiveness of the tourist regions, the authors used TTCI-Travel & Tourism Competitiveness Index data proposed by the World Economic Forum. The design of the TTCI indicator is composed of three levels. Accordingly, the first level is made up of four sub-indexes: the environment for tourism, policy in the area of tourism, infrastructure, natural resources and cultural heritage. Moreover, each sub-index includes so-called

pillars that make up the next level of the structure indicator TTCI, which was the focus of the particular study. The research is based on the analysis of TTCI quantitative data and quantitative data available in secondary information sources. The methods of induction and deduction, analysis and synthesis are used to reach the aim of the research and make justified conclusions.

Research results

According to the United Nations World Tourism Organisation (UNWTO, s.a.), today Europe is the largest receiving continent for international tourists. In order to have a closer insight into the attractiveness of various European countries, the World Economic Forum annually issues tourism performance overview summarized in Travel and Tourism Competitiveness Index that includes factors determining the level of competitiveness regions. Thanks to it, it is possible to identify and compare the competitiveness of countries, assess the impact of individual factors on the competitiveness and identify the strengths and weaknesses of the tourist regions. A total of 14 pillars can be extracted in the TTCI version in 2015 and 2017. In turn, each pillar consists of several sub-indexes. Accordingly, in total 90 indicators were used in TTCI index. The value of the TTCI index in 2015 for Poland was 4.08 (on a scale of 1-7), which is 27th place in the ranking of European countries, where in 2017 it increased by 0.03 and reached the 25th position.

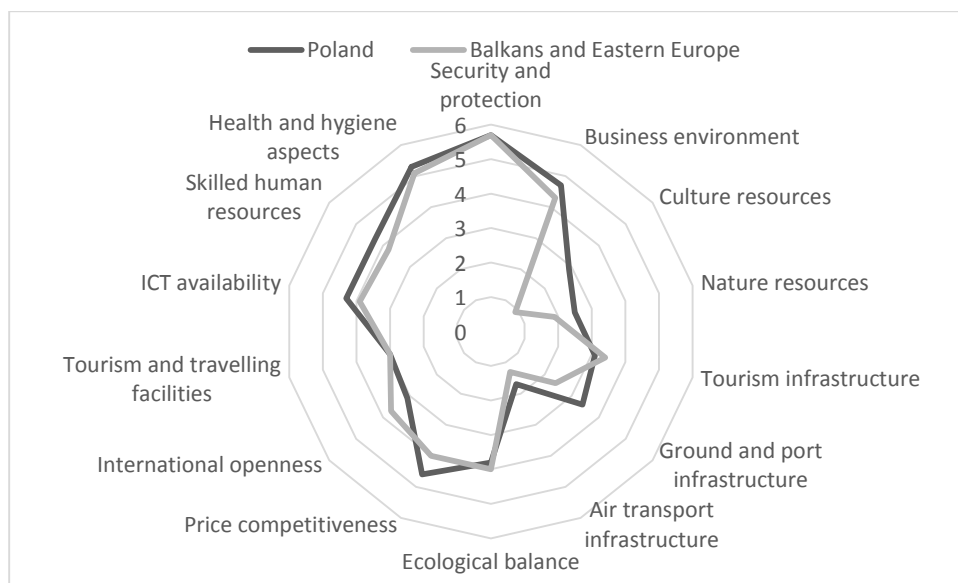


Source: Author's calculation based on *The Travel and Tourism...*, 2015, 2017

Fig. 1. European countries' tourism competitiveness index values in 2015 and 2017 (scale 1-7)

The data presented in *The Travel & Tourism Competitiveness Report* show that during the analysed period the leaders in the tourism competitiveness are Spain, France, Germany and the United Kingdom and their index values show a positive trend in the analysed 2-year period. The closest competitors of Poland that have obtained approximately same values are the Czech Republic, Hungary, Bulgaria, Slovakia and Latvia.

To have a closer insight into the attractiveness of Poland and its direct competitors, an in-depth analysis of the competitiveness of Poland as a tourist region in comparison to East European and Balkan countries was conducted by analysing the individual indicators of the second pillar in 2017 (Figure 2). The data of Figure 2 reveal that in half of the fourteen analysed indicators, the position of Poland is better than the average results of the Balkans and Eastern Europe.



Source: Author's calculation based on the Travel and Tourism Competitiveness Index in 2017

Fig. 2. Tourist competitiveness of Poland, Balkans and Eastern Europe (scale 1-7)

The Figure 2 gives evidence that the nature and landscape values of agricultural land of Poland are very highly rated in Europe. Especially it relates to such indicators as Cultural resources, Nature resources, Ground infrastructure, Port infrastructure and Air infrastructure, Ecological balance, Price competitiveness, Availability of ICT and Appropriately specialized working staff. In fact, all the other indicators very insignificantly lag behind the Balkans and other East European countries as the sub-index values differ very slightly. The only one indicator which stands out from these indicators is International openness, which incorporates such sub-index components as Visa requirements, Openness of bilateral air service agreements and Number of regional trade agreements in force, which in reality is only indirectly linked with Poland's nature and landscape attractiveness as it mainly depends on the EU geopolitical aspects both in each of the analysed countries' regional and the overall global scale. Therefore, the authors' research findings give evidence that 13 years after Poland's accession to the European Union, growing number of consumers in European countries perceive Poland as an attractive region. This increases the importance of the tourism economy, which represents a very important source of income. Therefore, tourism policy makers of Poland have to consider the currents gaps in Poland's tourism international openness and to consider ways how to reduce them both at the local level and in discussions with other EU Member States.

Conclusions, proposals, recommendations

- 1) Contemporary surroundings enforce continuous changes of all market entities - institutions, enterprises and, above all, regions. Their flexible adaptation to the existing conditions of the competitiveness becomes a necessity and is determined by the possession and the skilful use of a variety of material resources and, in particular, the intangible resources. Towns and regions also compete with one another trying to attract tourists.
- 2) Poland's tourism competitiveness shows a positive trend as its position of the World Economic Forum Travel and Tourism Competitiveness Index is constantly improving (from the 27th place in 2015 to the 25th place in 2017).
- 3) In the analysed period, the Travel and Tourism Competitiveness Report shows that the most competitive countries were Spain, France, Germany and the United Kingdom, whereas the closest competitors of Poland were the Czech Republic, Hungary, Bulgaria, Slovakia and Latvia.

- 4) The deeper insights in analysing the attractiveness of Poland compared with other East European and Balkan countries reveal that there are only few indicators Poland slightly lags behind the Balkans and other East European countries. The indicator which stands out from these indicators is International openness which incorporates such sub-index components as Visa requirements, Openness of bilateral air service agreements and Number of regional trade agreements in force.
- 5) The tourism policy makers of Poland have to conduct a deeper analysis of the currents gaps in Poland's tourism international openness and consider the possible ways how to reduce them by organizing discussions with local stake holders such as tourism operators and providers, NGOs, regional tourism authorities as well as by taking an active part in discussions with the EU Member States.

Bibliography

1. Chudy-Hyski, D. (2009). *Uwarunkowania turystycznego kierunku rozwoju gorskich obszarów wiejskich polski*, Krakow, s. 35.
2. Czudec, W. (2010), Konkurencyjność Regionów Polski Wschodniej. W: Zielinski Z. (red.), *Rola informatyki w naukach ekonomicznych i społecznych. Innowacje i implikacje interdyscyplinarne*, z. 2/2010, Wyd. Wyższej Szkoły Handlowej, Kielce.
3. Davidson, R. (1996). *Turystyka*. Wydawnictwo Polska Agencja Promocji Turystyki, Warszawa
4. Dabrowska, B.J. (2006). *Rozwój usług turystycznych w warunkach globalizacji. Zarys problematyki*, Wyższa Szkoła Turystyki i Hotelarstwa w Gdańsku, Gdańsk, s. 114.
5. Gaworecki, W. (2000). *Turystyka*. PWE, Warszawa.
6. Grabowski J. (2008). *Uwarunkowania konkurencyjności turystycznej regionów*, Ruch prawniczy, ekonomiczny i socjologiczny, Rok LXX, z. 3, ss. 149-164.
7. Grinberga-Zalite, G., Vitolina, Z., Rivza B. (2017). Knowledge and Skills Transfer for Sustainable Rural Tourism in the Baltic Sea countries. Turkish Online Journal of Educational Technology. - Special Issue for INTE 2017 (November 2017), pp. 350.-354.
8. Klamut, M. (2008). Konkurencyjność gospodarki regionalnej i lokalnej. W: Strzelecki Z. (red.), *Gospodarka regionalna i lokalna*, PWN, Warszawa.
9. Kraciuk, J. (2016). Konkurencyjność turystyczna Polski na tle krajów europejskich. W: Balinska A. (red.) *Wyzwania rozwoju turystyki*, SGGW Warszawa.
10. Krzyżanowska, K., Sikorska-Wolak I. (2010). Przedsiębiorczość w ujęciu teoretycznym i w praktyce. W: Krzyżanowska K. (red.) *Przedsiębiorczość na obszarach wiejskich – stan i perspektywy rozwoju*, vol. 1, s. 39-41, Wydawnictwo SGGW, Warszawa.
11. Markowski, I. T. (1977). Konkurencyjność i współpraca wewnątrz regionalna podstawa nowoczesnej polityki rozwoju regionalnego. W: Mikołajewicz Z. (red.), *Podstawowe problemy polityki rozwoju regionalnego i lokalnego*, Opole.
12. Markowski, T. (2005). *Przedmiotowa i podmiotowa konkurencyjność regionów*, KPZK PAN, Biuletyn, nr 219, Warszawa, ss. 24-37.
13. Ratajczak, W. (2008). Innowacyjność a konkurencyjność polskich regionów. W: Parysek J.J., Strykiewicz T., (red.) *Region społeczno-ekonomiczny i rozwój regionalny*, Poznań, Bogucki Wydawnictwo Naukowe.
14. Richter-Kazmierska, A. (2007). Partnerstwo na rzecz rozwoju regionalnego a konkurencyjność regionalna. W: Biernat T. (red.) *Przedsiębiorstwo i państwo – wybrane problemy konkurencyjności*. Katedra Mikroekonomii Uniwersytetu Szczecińskiego, Szczecin.
15. Roszkowska-Madra, B. (2010). *Obszary wiejskie o niekorzystnych warunkach gospodarowania w aspekcie ich zrównoważonego rozwoju*, Uniwersytetu w Białymstoku, 10.
16. Rosner, A. 2002. Wiejskie obszary kumulacji barier rozwojowych. IRWiR, PAN Warszawa.
17. Rosner, A., Stanny M. 2007. Uwarunkowania, bariery, nowe rozwiązania instytucjonalne. „Nowe Życie Gospodarcze” nr 21.
18. Sikora, J. (2014). *Turystyka wiejska, w tym agroturystyka, w kontekście perspektyw rozwoju wsi i rolnictwa w Polsce. Analiza wyników badań empirycznych*, Zesz. Nauk. Uniwersytetu Szczecińskiego, nr 807, Ekonomiczne Problemy Turystyki, nr 3(27), 113-126.
19. Stanny, M. (2013). *Przestrzenne zróżnicowanie rozwoju obszarów wiejskich w Polsce*. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk, Warszawa.
20. Szromek A.R. [bd]. *Pomiar funkcji turystycznej obszarów za pomocą wskaźników funkcji turystycznej na przykładzie obszarów państw europejskich*
https://www.ue.katowice.pl/fileadmin/_migrated/content_uploads/8_A.R.Szromek_Pomiar_Funkcji_Turystycznej....pdf (data dostępu: 20.01.2018)
21. The Travel & Tourism Competitiveness Report 2015. (2015). Growth through Shocks. World Economic Forum, Geneva.

22. The Travel and Tourism Competitiveness Report 2017. (2017). Growth through Shocks. World Economic Forum, Geneva.
23. United Nations World Tourism Organization. Regional Department for Europe. Available: <http://europe.unwto.org/>. Retrieved: 20.03.2019
24. Warszynska, J., Jackowski, A. (1978). *Podstawy geografii turystyki*, PWN, Warszawa.
25. Wielofunkcyjność rolnictwa. Kierunki badań, podstawy metodologiczne i implikacje praktyczne. (2010). Pod red. J. Wilkina. IRWiR PAN, Warszawa, 17.
26. Wilkin, J. (2007). *Wielofunkcyjność rolnictwa i obszarów wiejskich. Wyzwania przed obszarami wiejskimi i rolnictwem w perspektywie 2014–2020*. „Nowe Życie Gospodarcze” nr 21.
27. Winiarski, B. (1999). Konkurencyjność: kryterium wyboru czy kierunek strategii i cel pośredni polityki regionalnej? W: Klamut M. (red.) *Konkurencyjność regionów*, Wydawnictwo Akademii Ekonomicznej im. O. Langego we Wrocławiu, Wrocław.
28. Wisniewska, A. (2008). *Dochodowość usług agroturystycznych w gospodarstwach kaszubskiej gminy Brusy*, Slupskie Prace Geograficzne, nr 5, 221-225.
29. Zarebski, P. (2015). *Wybrane elementy turystyki kulturowej jako czynnik rozwoju bazy noclegowej na obszarach wiejskich w Polsce* <http://turystykakulturowa.org/ojs/index.php/tk/article/viewFile/527/508>
30. Zawadzki, P. (2014). *Ekonomiczno-społeczne uwarunkowania rozwoju agroturystyki w powiecie jeleniogorskim*, Zesz. Nauk. Uniwersytetu Szczecińskiego, nr 806, Ekonomiczne Problemy Turystyki, nr 2(26), 315-329.
31. Zemla, M. (2010). *Wartość dla klienta w procesie kształtowania konkurencyjności obszarów recepcji turystycznej*. Wydaw. GWSSH w Katowicach, Katowice.
32. Zvirbule A., Dobeles A. (2018). Gastronomic Tourism in Latvia: Features and Opportunities for Development. IX International Scientific Agriculture Symposium „AgroSym 2018”: Book of proceedings, Jahorina, Bosnia and Herzegovina, 4-7 October 2018 / University of East Sarajevo, Faculty of Agriculture. - Jahorina, 2018. - pp. 1911-1916.

DIMENSIONS OF THE FUNDING PROGRAMMES FOR SUSTAINABLE RURAL DEVELOPMENT IN ROMANIA

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Abstract. As part of the Common Agricultural Policy, the European Union offers a complex system of rural development interventions, an increased flexibility, allowing through the Rural Development Plan the design of financial envelope according to the national specificity, based on the principle of subsidiarity. The paper examines, using a comparative analysis based on national data, as well as the statistics provided by Eurostat, how Rural Development Plan and the National Plan for Local Development (funded by the national government) have effectively contributed to the sustainable development of rural areas from Romania, emphasizing some specific aspects of the implementation.

Key words: rural development, funding programmes, sustainability, agriculture, environment, competitiveness.

JEL code: O21, O22, Q01, Q18, R51.

Introduction

The major objectives of the rural development policy are the enhancement of the quality of life of the rural population and improvement of the overall competitiveness of rural areas; whilst agricultural policy has the improvement of farmers' incomes as its main goal, even if agricultural policy objectives have been evolving in many countries and at present they often include environmental objectives and the production of non-output goods (multifunctionality of agriculture)(OECD, 2006).

The European Union sustainable development strategy emphasizes the need for a cost-effective implementation of political measures, being relevant for funding programs for rural areas (Uthes 2017).

Romania has a rich natural environment and high biodiversity, including the Carpathian Mountains, the Danube Delta Biosphere Reserve and 300,000 ha of virgin forest. Natural and semi-natural ecosystems cover around 47 % of the national territory. Approximately 2.4 million ha of the country's semi-natural grassland is classified as of High Nature Value (HNV).

Rural areas are typified by a scattered population and very low quality infrastructure (only 33 % of rural residents are connected to a water supply network, only 10 % to a sewerage system and only 10 % of rural roads are of adequate standard). Basic social infrastructure (health and education systems, finance and credit provision etc) is also much less developed than in urban areas. These factors affect the quality of life in rural areas, hamper economic development, increase outmigration, and exacerbate health and environmental problems (Brandt 2007). The rural economy is highly dependent on agriculture and forestry, with low development of alternative activities, and lower incomes than urban areas. As Member State since the 1st of January 2007, Romania choose to have one RDP for the whole country.

The aim of the paper is to analyse the way the funding through the NPRD contributes to a sustainable rural development, by analyzing the indicators related to the economic, social and environmental dimensions of the rural sustainable development, in the economic, social and environmental indicators, in accordance with the stipulations of the National Plan for Rural Development.

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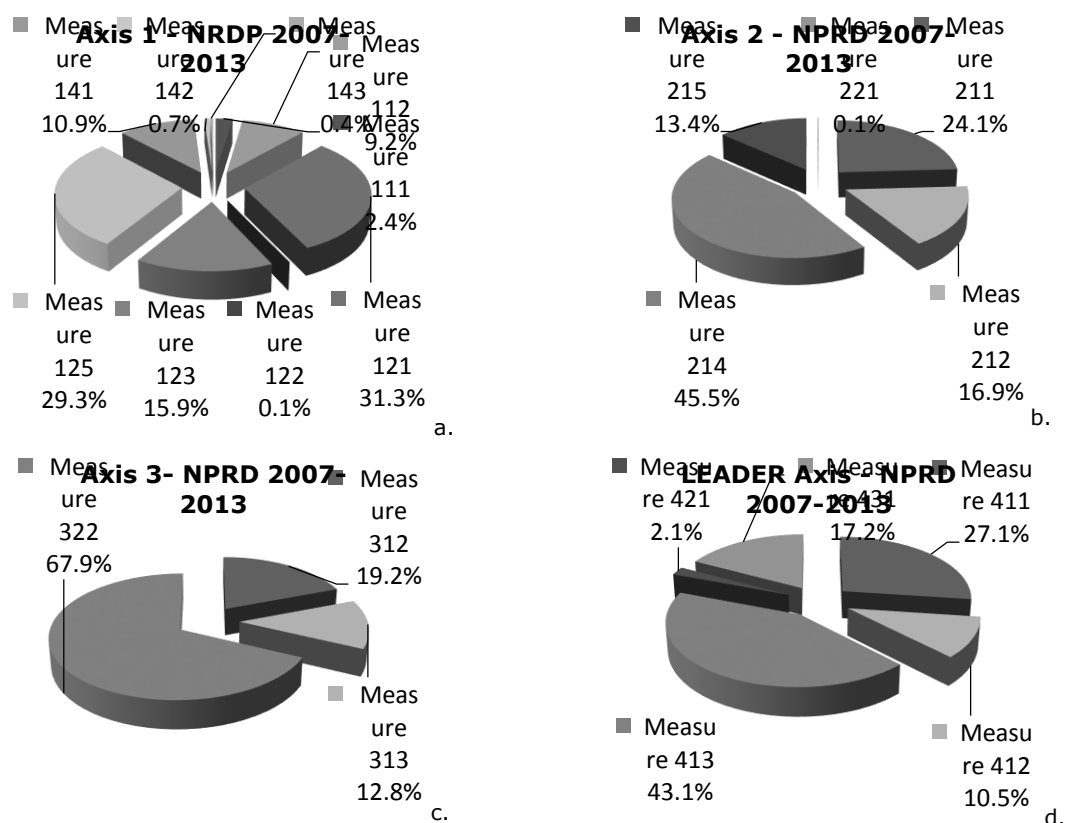
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Achievements of the National Rural Development Plan 2007-2013

During the 2007-2013 funding period, improving the quality of life was a stated goal of the rural development policy within the framework of the EAFRD Regulation, and a strategic priority of the European Union (EU) (Moser 2018).

The overall objective of the first planned period of the National Plan for Rural Development NPRD was to increase the competitiveness of the agri-food and forestry sectors, by improving rural areas, quality of life in rural areas and environment protection. In order to achieve these objectives, at NRDP were defined four axis: Axis 1 „*Improvement competitiveness of the agricultural and forestry sector*“, the overall financial allocation, was 4.785.667.281 Euro, out of which 2.885.269.470 Euro public expenditure and 1.900.397.811 Euro private expenditure. The main share has been assigned for *Measure 121 Modernization of agricultural holdings* (31,3 %), targeting the specific objectives: introduction and development of new technologies and procedures, production diversification, adjusting the profile, level and quality of production to market requirements including the organic production, as well as obtaining and using energy from renewable sources (Fig. 1a).



Source: Authors' calculation based on MADR data

Fig. 1. National Plan for Rural Development 2007-2013, share of allocation by measures.

Axis 2 „*Improvement of environment and rural area*“, with a total cost of € 3.163.717, of which € 3.163.239 public expenditure. A share of 45,5 % has been designed for Measure 214 Agri-environment payments, needed to support the sustainable development of rural areas. For Measure 211 Support for Disadvantages Mountainous Areas, the total allocated cost was 769,555,055 Euro, representing a share of 24.1 % (Fig. 1b). Axis 2 measures for agricultural land have contributed to: maintaining biodiversity - 6,073 million ha; soil quality – 864 thousand ha; water quality - 2,186 million ha; avoiding the isolation and abandonment of land - 6,014 million ha; mitigation of climate change - 1,431 million ha.

Axis 3 „Rural diversification and quality of life“, with an overall cost of € 2.719.923, of which € 2.337.695 Euro public expenditure. A large amount of the funding has been allocated for village renewal and rural services. The achievements: Measure 312 „Micro-enterprises“: 9,499 applications, 3,130 contracted projects, € 402,7 million euro; payments: € 264 million; Measure 313 „Agro-tourism“: 1,684 contracted projects, of € 236,7 million euro; Payments: € 86.4 million; Measure 322 „Village Renovation and Development“: 3,317 applications, of € 7,64 billion (allocation of EUR 1,6 billion); 877 contracted projects, of 1.73 billion euros; payments: € 1.4 billion (Fig. 1c).

Axis 4 LEADER, with a total cost of 524.094 Euro, of which 386.164 public expenditure. The main measures at Axis 4 level in terms of total allocated budget are 41 „Implementation of local development strategies „(ie Leader Axis 1 - 411 and Leader Axis 3 - 413) and 431 Local Action Groups, acquiring skills and animating the territory (Fig. 1d).

Analysing the achieved results through the NRDP 2007-2013, 2,597 farms and over 73,000 farmers (through measures 112 - Young farmers, 141 - semi-subsistence farms and 121 - farm modernization) were funded. 3.133 non-agricultural SMEs from rural areas and 1,011 processing units (Measure 123) received funding. Over 3 million inhabitants benefited from village infrastructure (Measure 322): 3,862 km of modernized communal roads, 2,900 km of water supply network and 4,345 km of built-up sewerage network. There have also been built 1,967 km of agricultural roads and 1,610 km of forest roads (Measure 125). Also, through the NRDP 2007-2013, 137 projects of irrigation works were funded and works for flood protection of 44,794 ha were carried out. A total of 318,794 ha have been carried out for the modernization and rehabilitation of the irrigation infrastructure. The Agency for Rural Investment Finance (AFIR) has paid over 7.4 billion euros to beneficiaries of RDP 2007-2013, reaching an absorption degree of over 86 % of the total European funds allocated to Romania.

Overall, in the period 2009-2015, the measures analysed through the counterfactual analysis has created a net effect of about 20.760 jobs. The net effect in the non-agricultural sector reaches 7.142 which represents 13 % of the target value of the impact result indicator (AFIR 2019).

Targets of the 2014 - 2020 Rural Development Program for Romania

The goals of the Europe 2020 Strategy, which Romania has also assumed and to which it has to contribute, according to the National Reform Program, are: •employment rate of the population aged between 20 and 64 years of 75 % (RO 70 %); •R & D investment rate of 3 % of European Union GDP (RO 2 %); •20/20/20 target on energy and climate change: greenhouse gas emissions by 20 % below 1990 levels; •20 % of the energy produced from renewable sources (RO 24 %); •20 % increase in energy efficiency; •Early school dropout rate below 10 % (RO 11.3 %); •the share of young people aged 30-34, who graduates from a form of tertiary school, at least 40 % (RO 26.7 %); reducing the number of people exposed to poverty by 20 million (Cretu 2015).

Romania's RDP 2014-2020 funds actions under all six RD priorities, according to the economic, social and environment dimensions of the sustainable development (Tab. 1).

The total public expenditure of the RDP 2014-2020 is € 9.441 billion. The highest share is allocated to four measures: 26.6 % allocated to Measure 4 – Investments in physical assets, 13.8 % for Measure 13 – Payments to areas facing natural or other specific constraints; 13.8 % is allocated for Measure 7 – Basic services and village renewal in rural areas and 9.5 % allocated to Measure 6 – Farm and business development (Tab. 2).

Table 1

Priorities of the National Plan for Rural Development 2014-2020 of Romania

RD 2014-2020 Priority	Target
Knowledge transfer and innovation in agriculture, forestry and rural areas	<ul style="list-style-type: none"> • Training for 184 000 persons; • 30 000 farmers and owners of small processing units will be trained linked to development of their farm/food businesses (particularly small and young farmers); • more than 150 000 farmers will be trained on how to better deliver environmental and climate-related benefits.
Food chain organisation, including processing and marketing of agricultural products, animal welfare and risk management in agriculture	<ul style="list-style-type: none"> • modernisation and support of the investments of nearly 300 food processing units; • setting up of 62 new producer groups; • participation of 620 holdings, to support cooperation projects; • new participation by 400 farmers and groups of farmers in quality schemes; • 5 000 farmers will be supported for premium for insurance; • 600 pig and poultry holdings will receive payments for the animal welfare commitments.
Restoring, preserving and enhancing ecosystems related to agriculture and forestry	Environmental and climate payments for: <ul style="list-style-type: none"> • Million hectares of agricultural land • 800.000 hectares of forest Payments for organic agricultural practices: <ul style="list-style-type: none"> • 200.000 hectares
Resource efficiency and climate	<ul style="list-style-type: none"> • 435 projects for modernisation of existing irrigation infrastructure (for 400.000 hectares of agricultural land); • 870 investments targeting the reduction of GHG and NH3 emissions.
Social inclusion and local development in rural areas	<ul style="list-style-type: none"> • 27.000 jobs (2 000 will be created under LEADER) • 800 projects will be supported to improve small-scale rural infrastructure, improving living conditions for some 27 % of the rural population • 400 local cultural patrimony buildings will be restored and preserved

Source: authors' synthesis -European Commission data

Analysing the current situation, the value of the submitted projects on measure 4 exceeds more than 170 % the financial allocation, the highest exceeding being registered for Measure 4.1a – Investments in fruit growing sector and Measure 4.2 – Support for investment in processing/marketing of agricultural products (172 %).

Table 2

Analysis of the projects 2014-2020 (situation on 2019 February 7th)

Measure	Public expenditure (Euro)	Submitted projects, value (Euro)	Selected projects, value (Euro)	Approved projects, value (Euro)
1.1 Support for vocational training and skills	54.191.022	30.494.562	14.183.396	3.335.918
1.2 Support for demonstration and information activities	13.414.500	839.227	719.227	0
4.1 Investments in agricultural holdings	844.672.338	2.233.717.657	865.508.578	649.512.819
4.1 Investments in agricultural holdings ITI Danube Delta	33.000.000	56.160.669	25.153.553	20.064.376
4.1a Investments in fruit growing holdings	284.356.109	401.895.369	244.440.048	178.749.673
4.1a Investments in orchard holdings ITI Danube Delta	5.000.000	4.923.015	4.358.466	4.358.466
4.2 Support for investments in the processing / marketing of agricultural products	359.883.695	618.728.194	230.818.463	152.029.849
4.2 Support for investments in the processing / marketing of agricultural products ITI Danube Delta	10.600.000	11.489.693	10.959.866	10.380.115
4.2 State aid scheme	112.500.000	122.749.069	80.193.763	66.897.136
4.2 Minimis Scheme	12.500.000	805.256	614.753	614.753
4.2a Investments in the processing / marketing of fruit growing sector products	34.629.439	11.672.499	10.234.665	7.231.399

Measure	Public expenditure (Euro)	Submitted projects, value (Euro)	Selected projects, value (Euro)	Approved projects, value (Euro)
4.3 Investments for the development, modernization or adaptation of agricultural and forestry infrastructure - irrigation	433.978.719	226.680.858	189.050.730	180.347.372
4.3 Investments for the development, modernization or adaptation of agricultural and forestry infrastructure - irrigation ITI Danube Delta	7.000.000	6.798.482	6.794.520	6.794.507
4.3 Investments for the development, modernization or adaptation of agricultural and forestry infrastructure - agricultural access infrastructure	130.298.233	418.451.214	78.989.370	77.428.873
4.3 ITI Danube Delta	3.000.000	3.452.793	3.347.047	3.347.047
4.3 Investments for the development, modernization and adaptation of the agricultural and forestry infrastructure - forestry infrastructure	99.271.119	146.722.415	91.277.869	91.032.475
4.3 Investments for the development, modernization and adaptation of the agricultural and forestry infrastructure - forestry infrastructure ITI Danube Delta	1.700.000	1.462.698	1.421.820	1.421.820
6.1 Support for the installation of young farmers	426.744.132	582.350.000	409.630.000	406.460.000
6.1 Support for the installation of young farmers ITI Danube Delta	10.000.000	9.470.000	8.300.000	8.180.000
6.2 Support for the establishment of non-agricultural activities in rural areas	106.569.178	345.330.000	111.320.000	108.958.000
6.2 Support for the establishment of non-agricultural activities in rural areas ITI Danube Delta	5.000.000	15.250.000	4.860.000	4.510.000
6.3 Support for the development of small farms	246.493.158	255.570.000	115.365.000	114.247.500
6.3 Support for the development of small farms ITI Danube Delta	5.000.000	3.435.000	1.305.000	1.121.250
6.4 Investments in the creation and development of non-agricultural activities	166.503.969	423.835.358	162.489.275	145.676.463
6.4 Investments in the creation and development of non-agricultural activities ITI Danube Delta	10.000.000	17.180.257	9.132.873	6.552.304
6.5 Scheme for small farmers	12.333.000	61.813	4.882	4.882
7.2 Investments in the creation and upgrading of small scale basic infrastructure - water / waste water infrastructure	1.109.058.285	726.335.354	476.597.571	428.247.490
7.2 Investments in the creation and upgrading of small scale basic infrastructure - water / waste water infrastructure ITI Danube Delta		13.204.837	11.729.437	11.729.437
7.2 Investments in the creation and upgrading of small-scale basic infrastructure - road infrastructure		1.006.959.285	510.942.432	494.162.183
7.2 Investments in the creation and upgrading of small-scale basic infrastructure - road infrastructure of local interest ITI Danube Delta		25.754.682	24.700.601	24.700.601
7.2 Investing in the creation and upgrading of small-scale basic infrastructure - educational and social infrastructure		168.742.693	121.037.443	116.373.553
7.2 Investing in the creation and upgrading of small-scale basic infrastructure - educational and social infrastructure ITI Danube Delta		2.684.356	1.792.188	1.792.188
7.4 Support for investment in the creation, improvement or extension of base services for the rural population, including leisure and culture, and related infrastructure	13.761.860	0	0	0
7.6 Investments associated with the protection of cultural heritage	188.010.999	304.396.659	211.735.295	207.961.365

Measure	Public expenditure (Euro)	Submitted projects, value (Euro)	Selected projects, value (Euro)	Approved projects, value (Euro)
7.6 Investments associated with the protection of cultural heritage ITI Danube Delta	9.000.000	4.247.900	4.009.098	4.009.097
8.1 Afforestation and creation of wooded areas	126.801.632	10.996.025	4.486.466	4.486.466
9.1 Establishment of producer groups	14.736.313	3.674.879	3.670.419	3.370.418
9.1a Establishment of the fruit sector producer groups	5.300.811	0	0	0
15.1 Payments for commitments in the field of forestry and climate	70.147.754	2.793.323	1.649.316	0
16.1 Support for the establishment and operation of operational groups (GO), for the development of pilot projects, new products Stage I- Expression of interest	6.723.721	49.067.192	8.376.817	
16.1a Support for the establishment and operation of operational groups (GO), for the development of pilot projects, new products – fruit sector - Stage I	5.819.040	31.125.190	7.206.293	
16.1a Support for the establishment and operation of operational groups (GO), for the development of pilot projects, new products – fruit sector Stage II				
16.4 Support for horizontal and vertical cooperation between actors in the supply chain	10.085.582	11.885.142	5.728.359	4.286.059
16.4a Support for horizontal and vertical cooperation between actors in the supply chain –fruit sector	8.728.560	3.437.443	2.122.246	1.808.062
19.1 Preparatory support for the development of local development strategies	1.990.183	2.435.307	2.379.233	2.224.725
19.2 Support for the implementation of actions within the local development strategy	495.598.466	307.847.362	248.210.323	247.563.169
19.3 Preparation and implementation of the Local Action Group's cooperation activities	16.987.679	173.297	80.947	15.000

Source: Authors' synthesis based on MADR(2019) –

Romania has also chosen to implement a separate thematic sub-programme (with indicative financial allocation of € 320 million EAFRD funds) aimed to increase the competitiveness and enable restructuring of the fruit growing sector, a sector where Romania has climatic advantages and traditional strengths, but which has suffered from under-investment. Support is given for the setting-up of new orchards, reconversion of the old ones, fruit processing, cooperation projects, and the setting-up of producer groups within the sector (Alecu 2016).

Interventions in the Danube Delta are eligible for funding under five measures; there are two strategic objectives: 1) preservation of unique natural values through environmental management guided by science and by strengthening local communities in their role as proactive protectors of this unique world heritage; and 2) The development of a green, inclusive local economy based on sustainable consumption and protection, resource-efficient, capitalizing on the comparative advantages of the area benefiting from the support of improved public services (ENRD 2017).

National Plan for Local Development

NPLD is a multi-annual funding program coordinated by the Ministry of Regional Development and Public Administration from Romania, whose main objective is to support the sustainable development of the administrative-territorial units (MDRAP 2019).

Table 3

National Plan for Local Development of Romania

Field	Public expenditure Stage I - 2013-2019 (Euro)	Public Expenditure Stage II- 2017-2020 (Euro)	Total Payments 2013-2018 (Euro)
Water supply	490.160.320	477.244.568	364.929.000
Water supply + sewerage	71.273.820	487.342.347	35.486.820
Sewerage	628.756.452	865.043.894	409.365.290
Roads	2.207.640.433	3.130.386.742	1.762.914.738
Primary schools, gymnasiums and high schools	177.475.784	516.071.492	100.332.031
Kindergarten	57.591.381	249.568.475	36.621.783
Medical care units	2.360.578	229.932.961	11.165.535
Bridges	54.595.981	242.697.785	41.123.214
Other fields(public institutions, cultural , tourism infrastructure)	33.031.203	84.232.853	24.941.949
Total	€ 3,69 billion	€ 6,198 billion	€ 2,76 billion

Authors' synthesis based on Ministry of Regional Development and Public Administration data

The achievements of the first stage of the program 2013-2019 were: 5,502 financed investment objectives of which: 3,129 completed targets; total allocation: € 3,69 billion; total allocated 2018: € 0.4 billion (MDRAP 2019). The second phase of the program finances 9,500 investment objectives, of which 2,500 medical care units and kindergartens, 2,000 schools and 5,000 other objectives (from all eligible areas). For these investments, funds amounting to 30 billion lei are committed (Tab. 3).

The comparative analysis of the two NPLD stages emphasizes a raise of 68.75 % of the allocation for local development.

Conclusions

- 1) Based on the principle of subsidiarity, Romania selected the rural development measures which fit to national circumstances: negative demographic trend - declining rural population, poor development of non-agricultural activities which generates the rural population's dependence on subsistence agriculture; low level of labor productivity; low level of primary education graduation and high school abandonment of compulsory education compared to urban areas; underdeveloped entrepreneurial culture, characterized by lack of basic managerial knowledge; low income per household; poor quality of tourism infrastructure and rural tourism services; underdeveloped or incomplete basic rural infrastructure (especially in mountain areas) - road, water, sewerage, electricity; limited access to basic social services (health, care of the elderly, kindergartens, etc.); increased share of the rural population at risk of poverty or social exclusion; degradation of traditional settlements with cultural value and historical monuments.
- 2) The statistical analysis of CMEF baseline indicator data, emphasizes the synergy (including territorial) between national and EU development programs.
- 3) Analysing the statistical national data, one emphasizes opportunities as: creation of new SMEs with non-agricultural, cultural, creative and cooperative activities in rural areas; further support investment in local agricultural and non-agricultural activities and rural services; development of basic infrastructure and services as a prerequisite for increasing the attractiveness of rural areas; the use of skills and capital assets by persons who have worked on external labor markets

in the agricultural field; further consolidate core training programs, lifelong learning programs and the development of entrepreneurial skills; the potential of information technology and media to support rural development; further financial support for protecting, preserving local resources (cultural heritage, natural heritage) as a basis for sustainable rural development; creation of brands and participating in quality schemes to generate added value in domestic products; the promoting of local identity; developing packages of financial instruments to support small businesses; strengthen partnerships as a basis for strengthening local strategies that can facilitate innovation, foster cooperation and local economic growth.

Bibliography

1. Alecu I. N., Stefan P., Cretu R. C., Cutas C. (2016), *Proposals Concerning the Promotion Strategy of Food Products in Foreign Markets*. Scientific Papers. Series „Management, Economic Engineering in Agriculture and rural development”, Vol. 16 ISSUE 1, PRINT ISSN 2284-7995, 31-38.
2. Blewitt, J. (2008), *Understanding Sustainable Development*, Earthscan Dunstan House, ISBN 978-1-84407-455-6;
3. Cretu, R.F., Ciobotar, G.N., Cretu, R.C. (2015), Survey Regarding the Corporate Governance Implementation in Romania. Scientific Papers. Series „Management, Economic Engineering in Agriculture and rural development”, Vol. 15 ISSUE 4, PRINT ISSN 2284-7995, 33-38.
4. Diakosavvas, D. (2006), *Coherence of Agricultural and Rural Development Policies*, OECD Publishing, ISBN-92-64-02388-7;
5. Brandt, H.; Otzen, U. (2007), *Poverty Orientated Agricultural and Rural Development*, Routledge, Taylor and Francis, ISBN13: 978-0-415-36853-7;
6. Moser, A.; Peter, H.; Fengler, B.; Strohm-Lompcke, R. (2018), *Improving the Quality of Life with Rural Development Programmes in Germany (2007-2013): Evidence from the Evaluation, European Countryside, Vol.10 2018 No.2, p.321-339*
7. Sheperd, A. (1998) *Sustainable Rural Development*, Palgrave Publishers Ltd, ISBN 978-0-333-66485-8;
8. Uthes, S.; Li, F.; Kelly, E. (2017), *Does EU Rural Expenditure Correspond to Regional Development Needs?, Land Use Policy 60 (2017) 267-280.*
9. AFIR(2019) available at <https://www.afir.info/>
10. Ministry of Agriculture and Rural Development MADR (2019), available at <http://www.madr.ro/pndr-2014-2020.html>
11. National Program for Rural Development PNDR (2019) available at <http://www.pndr.ro/situatia-proiectelor-depuse-2014-2020.html>
12. Ministry of Regional Development and Public Administration (MDRAP 2019) - National Program for Local Development available at <http://www.mdrap.ro/lucrari-publice/pndl>.

CURRENT CHALLENGES OF GROCERY MARKET AND KEY DIRECTIONS OF DEVELOPMENT OF AGRICULTURE IN GEORGIA

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Abstract. The work deals with the need to substantiate topicality of research of grocery market and key directions of development of agriculture. The conclusion is made which states that the level of productivity in Georgian agriculture is low. Based on the analysis, causes of low productivity of the industry and low level of development of grocery markets is assessed: low level of competitiveness of agricultural products, impediments for Georgian products to enter grocery markets, underdeveloped grocery supply chain, absence of usage of modern technologies and technological opportunities in agricultural sector, small share in the budget for funding agriculture, incomplete and ambiguous regulatory laws, low level of compatibility with legislation of international markets, underdeveloped system of insurance in agriculture etc.

Strengths and weaknesses of development of Georgian agriculture are revealed through SWOT analysis, as well as opportunities and threats.

Factors of low pace in development of agriculture and limited opportunities for farmers on grocery markets are determined by the „quality of urgency-impact“ matrix, by using the scheme of priorities, needs of priority development of agriculture are revealed.

Conclusions and recommendations are suggested as a result of the research concerning current challenges of grocery markets and needs of priority development of Georgian agriculture.

Keywords: grocery markets, Georgia, agriculture, quality of urgency-impact, priority development.

JEL code: Q130.

Introduction

Grocery provision is one of the main prerequisites of welfare in society. As of today, populations of many countries of the world experience low level of supply with grocery and achieving food security is regarded as one of the main challenges. Development of grocery markets can be considered as the key solution of this problem, where the main supplier of products will be highly productive agriculture. It is substantiated by researchers that development of agriculture is necessary for achieving economic growth, especially in developing countries.

In Georgia, development of highly productive agriculture based on demands on grocery markets is extremely important due to several factors: 1. villages account almost half of the population (41,7 %); 2. the industry employs 48,6 % of the employees, the number of self-employed is especially high; 3. the share of agriculture in GDP is 8,2 %; 4. the level of grocery self-provision is low (wheat – 15 %, corn – 64 %, vegetables – 65 %, meat – 46 %, milk and dairy products – 82 % etc.); 5. there is a significant disproportion between import and export of agricultural goods, the amount of import exceeds export four times; 6. there is high level of poverty in villages – according to 2017 data 21,9 % of the population is beneath the level of absolute poverty. 7. there is high level of gender inequality in villages. As statistical evidence and rigorous studies conducted by researchers and non-governmental organizations suggested gender inequalities in employment, education and income distributions still prevails in Georgia. Not all groups in society have equal access to employability and entrepreneurial opportunities etc.

Besides, it is worth noting that export countries for Georgian agricultural goods are mainly European and post-soviet. The level of competition on markets of these countries is rather high. On

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the other hand, most of the Georgian agricultural products have low level of competitiveness. Georgia has signed trade agreement with Europe, which envisages fulfilment of additional obligations. For Georgia, it is still difficult to meet European market requirements. Besides the above-mentioned factors, it is unclear or does not exist legal basis; Georgian products fail to meet requirements for entering new markets.

Hence, almost half of the Georgian agricultural sector employees create small share of GDP, which refer to low productivity of the industry. Moreover, the level of development of agriculture is insufficient for overcoming poverty and high share of import threatens food security of the country. It is expected that in parallel with population growth and rising incomes, demand on agricultural goods will also increase. In order to satisfy increased demand and solve aforementioned problems, drastic transitions will be necessary in Georgian agricultural industry. These transitions will require revealing the potential of production of agricultural goods and determining priorities based on industry traditions and trends with implementing integrated strategies and diverse approaches. This concept of development comes into compliance with EU rural development policy approaches until 2020. Its main goal is to reveal local priorities by the efforts of community, determine strategies for investments. Currently Georgia does not have unified policy for agricultural development. Comprehensive research of agricultural problems and grocery markets can play key role in elaboration of the policy of agricultural development. Besides, recommendations elaborated based on the research will contribute to diversification of economy, growth of productivity, rising competitiveness, development of agribusiness, investments, innovations and employment.

The goal of the research is to determine priorities of agricultural development of Georgia and elaborate recommendations on directions of grocery market by revealing current challenges of grocery market.

Research methods. The following methods have been used during the research:

- through bibliographical and empirical research, data derived from various sources is evaluated: National Statistics Office of Georgia, ministries of agriculture and economics of Georgia, Parliament of Georgia, studies of Georgian and foreign scientists, analytical reports, publications and researches related to the industry;
- for selecting and grouping the data, identifying similarities and differences and revealing trends, methods of comparison, analysis, synthesis, induction etc. are used;
- as a qualitative research method, in-depth interviews with farmers and experts of agriculture is used;
- through SWOT analysis, strengths and weaknesses, as well as opportunities and threats of development of agriculture are identified;
- low pace of development of agriculture and factors of limited reach on grocery markets for farmers are revealed through the „quality of urgency-impact” matrix;
- by using the scheme of priorities, needs of development of agriculture are determined.

Research results and discussion

Georgia is a traditional agricultural country. Throughout history, this sector played a key role in grocery provision and improving welfare. However, during the last decades, the amount of production in agricultural industry of Georgia has decreased significantly. The pace of development of the industry even today is way behind other industries. Grocery markets and agricultural development in post-soviet countries are important factors for economic growth. Generally, it is widely accepted

that economic growth through agricultural development in GDP decreases poverty more effectively than other industries.

According to the modern studies, development of grocery markets and grocery provision of population is directly correlated to the productivity in the industry. It is also important to take into consideration the trend of fluctuation of prices on agricultural goods. The Organization for Economic Co-operation and Development (OECD) and Food and Agriculture Organization of the United Nations (FAO) forecast of major agricultural goods, biofuel and fishery for 2024 indicates decrease of real prices for all agricultural goods during the next ten years. The growing production supposedly will be supported by productivity growth and lower input prices. Slowing demand increase will be combined with high agricultural production growth. In addition, in developing countries the major changes in demand are projected.

Effective functioning of grocery markets greatly depends on implementation of relevant economic policy. Supply of agricultural products to the population and provision of healthy nutrition is the main aim of agrarian policy. Reforms based on such policy will contribute to retention of sustainable grocery provision in the long run.

Development of agriculture is the main challenge of sustainable grocery provision in Georgia. According to 2017 data, added value in agricultural sector accounted to 5,1 bn. lari (Fig. 1). In case of retaining this trend, the added value in the sector will increase to 5,9 bn. lari in 2020.

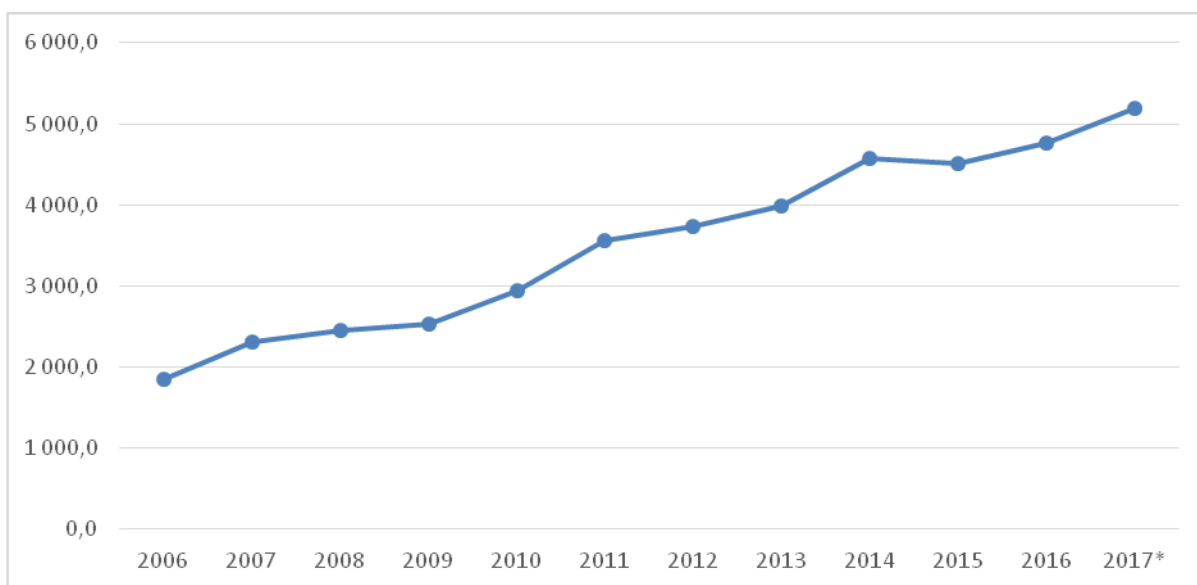


Fig. 1. **Trend of growth of generated added value in agricultural sector (m. lari)**

Grocery markets will boost agribusiness growth pace. As of today, Georgian agricultural goods are intended mainly for internal market. This is confirmed by the ratio of export-import of agricultural goods and its share in export (Fig. 2; Fig. 3).

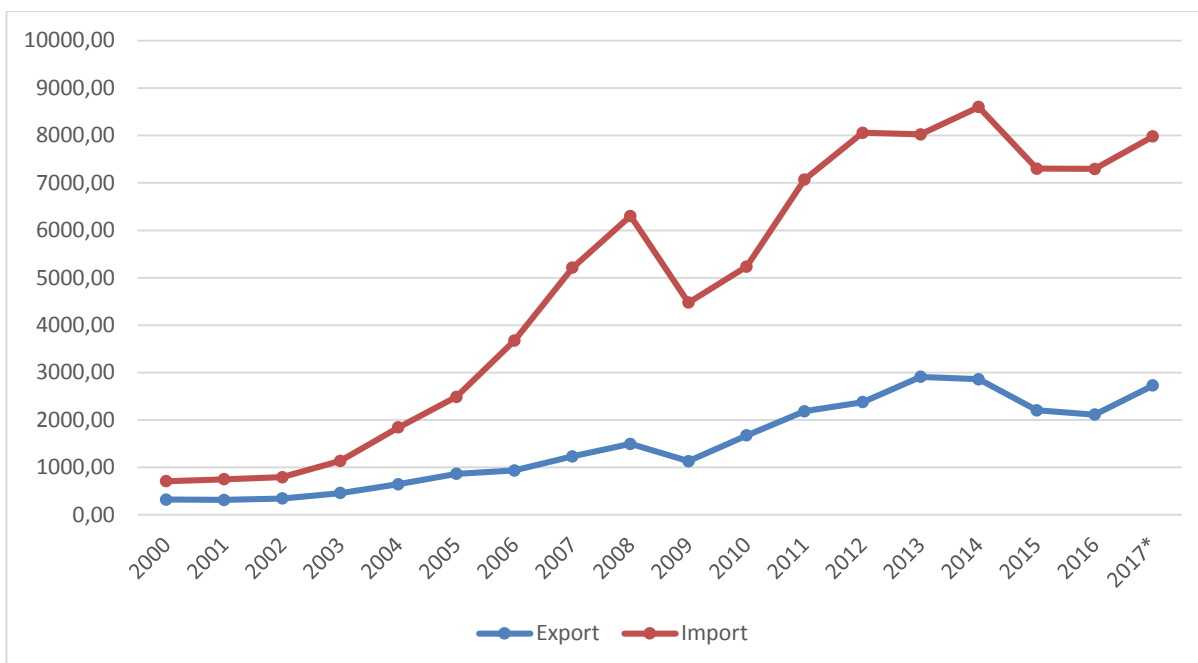


Fig. 2. **Dynamics of export and import in Georgia in 2000-2017 (m. USD)**

Comparative analysis of export and import data on agricultural goods revealed that according to 2017 data the amount of import significantly exceeded the amount of export and this trend remains unchanged. Also, structural changes in agricultural goods export were made lately. Nevertheless, the share of export of agricultural goods still remains small in overall amount of export. It fluctuates between 9-10 %.

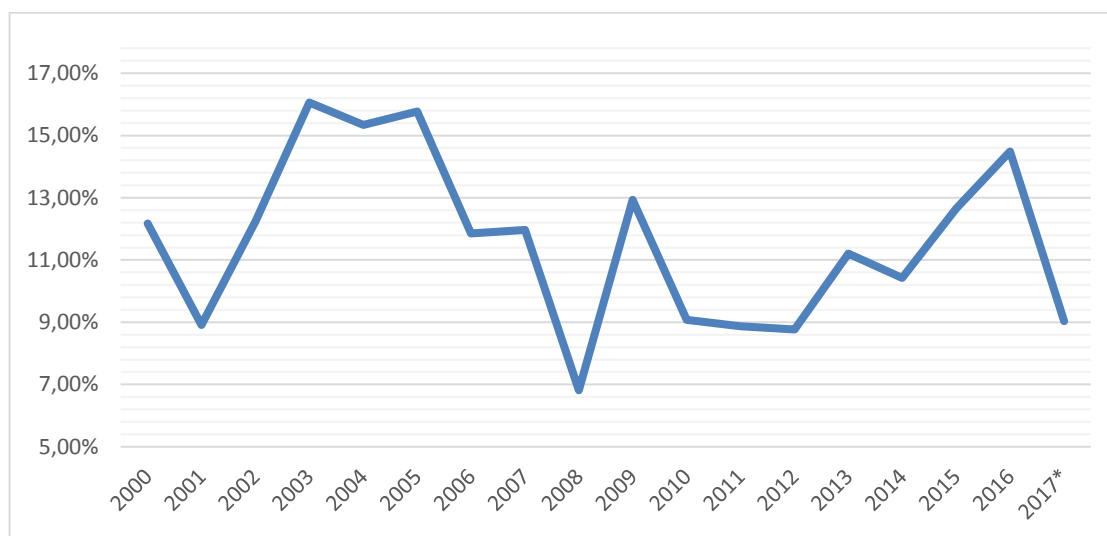


Fig. 3. **Share of agricultural goods in export in 2000-2017 (%)**

We can single out several important trends in agricultural sector of Georgia: 1. big number of employed individuals in the industry creates small amount of added value; 2. the pace of growth of production in agricultural industry increases threats in food security in short term prospect. As for the long run, it will not be enough for stable development of the industry and overcoming poverty; 3. the amount of import significantly exceeds the amount of export and local grocery markets are vulnerable to dumping prices; 4. share of export of agricultural goods in overall export is small, which limits awareness of Georgian agricultural goods on international agricultural markets etc.

Researchers conclude that growth of export allows developing countries overcome limited opportunities of reach on international and local markets. Also, this process boosts productivity and competitiveness.

The basis of development of agricultural markets is highly productive agriculture. In order to identify existing problems and prospects of development in Georgian agricultural industry, SWOT analysis was conducted. As a result of in-depth interviews with farmers and industry experts, strengths of Georgian agriculture were identified: quality soil for production of various types of products and environmental conditions; competence backed by the knowledge of the industry and traditions, growing interest from young generation towards agricultural industry etc. The following weaknesses were identified: low-productive species both in cattle breeding and plants; shortage of modern technologies; limited access to agro loans and low level of solvency among farmers; insufficient knowledge of modern technologies; absence of knowledge in drainage and irrigation systems; absence or malfunction of drainage and irrigation systems; falsified products on the markets; strong impact of environmental conditions; underdeveloped agri insurance systems etc.

Deriving from the SWOT analysis, there are the following opportunities for development of Georgian agricultural industry: creating new recycling enterprises; providing farmers with trainings; providing with business-consulting service; development of related and supportive industries; conducting programs of business loans and business grants aimed for small farmers; increasing accessibility on qualified professionals; improving species; creating cooperatives; acting against falsifications; developing agri insurance products; implementing modern technologies, decreasing damage of natural threats etc.

On the basis of grouping evaluations of experts, various threats must be reviewed. Natural threat is one of them (drought, flood, hail etc.); environmental pollution; migration and leak of knowledge; inertness of the population; epidemic diseases etc.

Low pace of development of agriculture and limited reach on grocery markets are caused by a group of factors. Evaluation of these factors was conducted by the „quality of urgency-impact” matrix (Fig. 4).

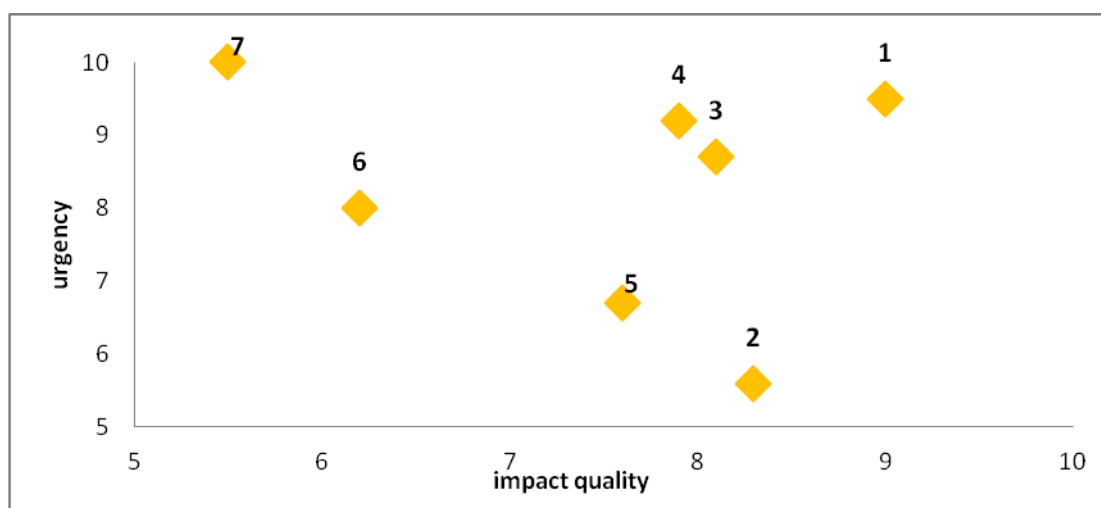


Fig. 4. Matrix of priorities „quality of urgency-impact”

It was revealed that low productivity and underdeveloped grocery markets of Georgian agricultural industry is caused by:

- 1) low competitiveness of products and impediments of entering grocery markets;
- 2) underdeveloped supply chain;

- 3) low level of usage of modern facilities and technologies;
- 4) small share of funding of agriculture in the state budget;
- 5) shortage of qualified professionals;
- 6) incomplete and ambiguous regulatory laws, low level of compliance with international legislation on grocery markets;
- 7) underdeveloped agri insurance system etc.

According to the revealed factors, by using priority scheme, needs of Georgian agricultural industry were determined according to the following order (Fig. 5).

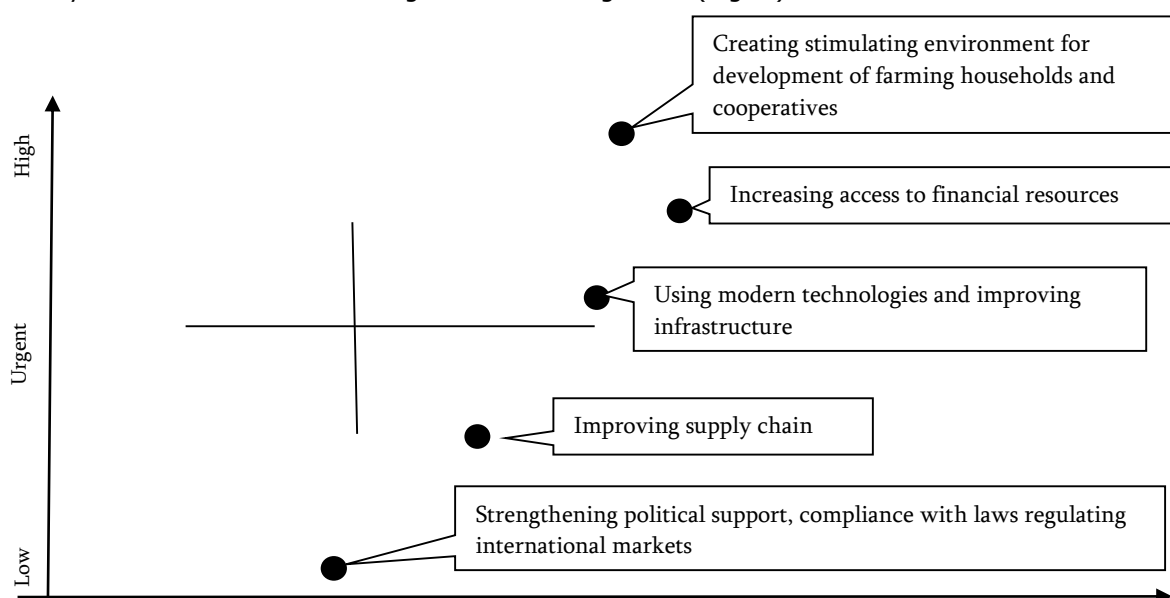


Fig. 5. Priority needs of development of Georgian agricultural industry

Creating favourable environment for farming households and development of cooperatives were determined as foremost premises for supporting agriculture. In its turn, it will have positive impact on development on land market. Land market in Georgia lacks development, most of farmers (75-80 %) are of small scale and they have limited access to grocery market. Moreover, they are unable to use modern technologies for production, fail to improve species, lack relevant agricultural services that causes low productivity of the industry. Development of farming households is necessary both for supporting grocery markets and economy in general. It will result in raising the level of production in agricultural products which will boost diversification and market processes.

We should review increasing accessibility on financial resources as one of the most important priorities. In addition, sceptical attitude towards cooperatives can be noticed in the decision making processes in the banks. Raising the lower limit of the loans in case of cooperation will serve as a motivation for enlargement. Improving the availability of financing will, in turn, reveal the importance of cooperation and encourage banks to make affirmative decisions with respect to cooperatives. In addition, it is essential to identify financial and non-financial needs of development of cooperatives based on the research.

Using modern technologies and improving infrastructure stand on the third position in priorities of development of agriculture. In most countries development of agriculture, effectiveness of production and raising profitability are facilitated by using modern technologies. In this viewpoint, it is important to share experience of successful countries where development of the industry relies on latest expertise and modern technologies.

Improving the supply chain will also significantly contribute to functioning grocery markets. In this point of view, the gap in supply chain between seller and buyer must be short which is of high importance. It will contribute to creating new connections between grocery reserves and the community. Reduction of loss on grocery also must be considered as important issue as this indicator equals to 30-40 % of overall amount of grocery production. Due to this fact, considerable shortage occurs on agricultural consumer markets.

The following „critical points“ are revealed in grocery supply chain in Georgia: risks are not assessed in agricultural production; agreements with business partners are questionable or ambiguous; rights on property of natural resources and utilization are not determined; there is no strategy for urban system of supply chain; issues of food security of local community need to be studied etc.

Political support also must be regarded as one of the priorities of development of grocery market and agriculture, as well as compliance with international legislation. The role of regions and municipalities in implementation of grocery provision policy is extremely weak. Activating grocery policy on local level will facilitate formation of new attitudes between the government and the society. Besides, increasing prices on grocery has become a subject of discussion among scientists and politicians. Raising prices is considered to be the main challenge on international grocery markets. 46 % of consumer basket in Georgia is filled with grocery which is twice as more as the same indicator in Euro zone. Considering this, raising prices on grocery is especially sensitive for the society. Increasing prices on grocery exceeds minimum wage for living. Retaining optimal ratio between minimum wage for living, inflation and grocery prices will become one of the main solutions for sustainable development of agriculture.

Implementation of state policy in subsidies, stimulation and other programs will be necessary. Major legal drawbacks in legislation must be eliminated. In particular, land code must come into force; law on household farming holds must be passed. Besides, a number of laws require improvement, such as grocery provision and harmlessness, laws concerning grocery safety and their compliance with European legislative space.

Systematic approach towards development of agriculture is foremost prerequisite for development of grocery markets. Development of agriculture based on such concept and priority needs will provide stable growth of quality and safe production of agricultural goods, eradication of food shortage, substituting import with local production, improving welfare of population.

Conclusions, proposals and recommendations

- There are low quotients of self-provision with main agricultural goods in Georgia, which threatens the country's food security. Development of agriculture and grocery markets are the main solution for the problem.
- Low level of production in Georgian agriculture industry and underdeveloped grocery markets are caused by the following factors: low level of competitiveness of agricultural goods; impediments for Georgian product for entering grocery markets; underdeveloped grocery supply chain; absence of modern technologies in agricultural production; small share of funding in the budget; incomplete and ambiguous legislation and its low compatibility with international legislation; underdeveloped agri insurance system etc. It is necessary to determine priority needs and elaborate development strategies based on the revealed factors.

- Derived from the priority scheme, development of Georgian agricultural industry should be carried out according to the following order: 1. creating favourable environment for development of farming households and cooperatives; 2. increasing accessibility on funding; 3. improvement of grocery supply chain by using relevant mechanisms; 4. strengthening political support for agriculture and grocery markets, modifying Georgian legislation for compliance with legislation regulating international markets.
- There is a direct correlation between grocery markets and agriculture. Strategy for development of agriculture must be elaborated with consideration of grocery markets, systematic and comprehensive approaches. Agricultural development strategy based on trends of grocery markets and priority needs will provide quality and safe growth in agricultural production, overcoming poverty in villages, food security, elimination of shortage on grocery, replacing import with growth of local production, improving welfare of the population.
- Political and financial support of grocery markets and agriculture is rather scarce. It is necessary to pass land code and law on farming households, improving legislation on grocery safety and harmlessness. It is also expedient to elaborate ways of budgetary support.

Bibliography

1. Agriculture of Georgia 2017, Tbilisi, 2018, pg. 17.
2. Agriculture of Georgia 2017, Tbilisi, 2018, pg. 17.
3. Chiladze, I. THEORETICAL AND PRACTICAL ASPECTS OF PROFITABILITY FACTORIAL ANALYSIS. 11th International Scientific Conference: Accounting and Finance: Science, Business and Public Sector Partnership. Journal: Science and Studies of Accounting and Finance: Problems and Perspectives, Volume 12, Number 1, pp. 12-18. 2018 <http://erd.asu.lt/ssaf/article/view/269>
4. Dobermann, A. & Nelson, R. 2013. Opportunities and Solutions for Sustainable Food Production. Sustainable Development Solutions Network Thematic Group on Sustainable Agriculture and Food Production.
5. Development and Integration of Education, Science and Business", Georgia, Tbilisi, 24-30 October, 2017.
6. Export-import of grocery. http://geostat.ge/index.php?action=page&p_id=751&lang=geo
7. Grocery balances. http://geostat.ge/index.php?action=page&p_id=751&lang=geo
8. Giovannucci, D., Scherr, S., Nierenberg, D., Hebebrand, C., Shapiro, J., Milder, J. & Wheeler, K. 2012. Food and Agriculture: The future of Sustainability.
9. Gulnaz Erkomaishvili. Economic Policy Priorities for Development of Georgia. Tbilisi, 2016.
10. International Panel of Experts on Sustainable Food Systems. 2015. The New Science of Sustainable Food Systems – Overcoming Barriers to Food Systems Reform.
11. Kharashvili, E., Challenges for Sustainable Food Security in Georgia, XV EAAE Congress in Parma: Towards Sustainable Agri-Food Systems: Balancing between Markets and Society, Parma, Italy, 29 August – 1 September 2017.
12. Kharishvili, E., Gechbaia, B., Tsiklashvili, N., Priorities of Socio-economic Development of Georgia and Ukraine: Innovative Approaches and Perspectives /International collective monograph, Chapter 2/ in STRATEGIC PRIORITIES FOR DEVELOPING UKRAINE AND GEORGIA: INNOVATION AND PARTNERSHIP. BATUMI 2018. p. 40.
13. Kharashvili, E., The Impact of Preferential Agro Credit on the Development of Agribusiness in Georgia, 2018. ECOFORUM. Volume 7, Issue 1(14), 2018.
14. Kharashvili, E., DIRECTIONS FOR IMPROVING THE SUPPLY CHAIN IN THE AGRO-FOOD SECTOR OF GEORGIA. Materials I International Scientific and Practical Conference „Forsight-Management: Best World Practice
15. Kharashvili, E., Challenges for Sustainable Food Security in Georgia, XV EAAE Congress in Parma: Towards Sustainable Agri-Food Systems: Balancing between Markets and Society, Parma, Italy, 29 August – 1 September 2017.
16. Labor and Unemployment in Georgia 2017. [http://geostat.ge/cms/site_images/_files/georgian/labour/dasaqmeba-umushevropa %202018.21.05_pres-relizi_GEO.pdf](http://geostat.ge/cms/site_images/_files/georgian/labour/dasaqmeba-umushevropa_%202018.21.05_pres-relizi_GEO.pdf)
17. Natsvlshvili, I. (2017) Gender Inequality and Women's Entrepreneurship-Challenges and Opportunities (Case of Georgia). In: Bilgin M., Danis H., Demir E., Can U. (eds) Country Experiences in Economic Development, Management and Entrepreneurship. Eurasian Studies in Business and Economics, vol 5. Springer, Cham. pp. 491-505.

18. Natsvlishvili, I., (2016). European Models of Farms Diversification and Current Challenges. *International Journal of Business and Management Studies*, 05(02):31–38 (2016). *UniversityPublications.net* . Available at <http://universitypublications.net/ijbms/0502/html/B6R219.xml>
19. Overall Production of Agricultural Goods, National Statistics Office of Georgia, geostat.ge/cms/site_images/_files/georgian/nad/agrobiznesi.xls
20. Renting, H. & Wiskerke, H. 2010. New Emerging Roles for Public Institutions and Civil Society in the Promotion of Sustainable Local Agro-Food Systems.
21. Strategy of Development of Agriculture in Georgia 2015-2020. P. 11.
22. The Level of Life. http://geostat.ge/index.php?action=page&p_id=187&lang=geo
23. Thematic Group on Sustainable Agriculture and Food Systems of the Sustainable Development Solutions Network. 2013. Solutions for Sustainable Agriculture and Food Systems. Technical report for the post-2015 development agenda.
24. Trends in Agricultural Production Efficiency and Its Implications for Food Security in Sub-Saharan African Countries. Christian Nsiah, Baldwin Wallace, University Bichaka Fayissa Middle Tennessee State University, 2017. file:///C:/Users/eteri/Downloads/TrendsInAgriculturalProductionEffici_preview.pdf

LABOUR MARKET TRENDS IN LATVIA

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Abstract. The labour market is the most important resource in the business environment. The employee is one of the main resources, the quality of which is the one that determines the quality of the company's goods and service. Two-fold information is heard in Latvia: state institutions point out that labour market trends are only improving, but entrepreneurs point out that there is a lack of a quality and motivated workforce. In the publicly available information, one can find indications that labour market indicators are improving, there are increasing average wages and decreasing unemployment rates. The article analyses the criteria that have the most impact on labour market trends. Each year the population of Latvia is decreasing, which can cause serious problems in nearest future and in the distant future - radical problems for all.

Key words: employees, employer, migration, labour market.

JEL code: J01, J08.

Introduction

Based on Central Statistical Bureau of Latvia (CSB), the number of employees in Latvia from 2012 till 2018 increased from 54.4 % to 65.3 %, and also unemployment rate reduced from 16.3 % to 7 %. At the same time, entrepreneurs are discussing that high qualification employees are hard to find. In the last six years, population rate has decreased from 2.1 million in 2010 to 1.9 million in 2018. Also, in 2013 the number of higher education graduates was 26057, but 2017 it was just 18354. All these numbers show that labour market rates are higher not just because employees can easier find jobs, but the number of employees is decreasing. Those employees who have jobs or are searching for new jobs with higher wage, can increase their demands for entrepreneurs. So, it leads to decreasing working quality, artificially increasing salaries and the demand for high qualified employees. The negative demographic trends, a corresponding shortage of labour in the future can be important barrier to economic growth. A key prerequisite for stabilizing labour supply is for changing demographic trends: the long-term gap between new-born and dead numbers must be bridged, while in the medium term, the labour market failures can be offset by a prudent migration policy.

For these reasons, the research aim is to describe labour market supply and demand for employee competencies and labour market trends in Latvia if, hypothetically, labour market trends depend on the population.

The research tasks were : 1) to describe and explain labour market trends; 2) to describe and explain differences of labour market demand for employees in different industries; 3) to describe migration impact on Labour market supply of employees.

The research object is labour market. The present research was based on monographic method, statistical analysis, abstract and logical analyses.

Research results and discussion

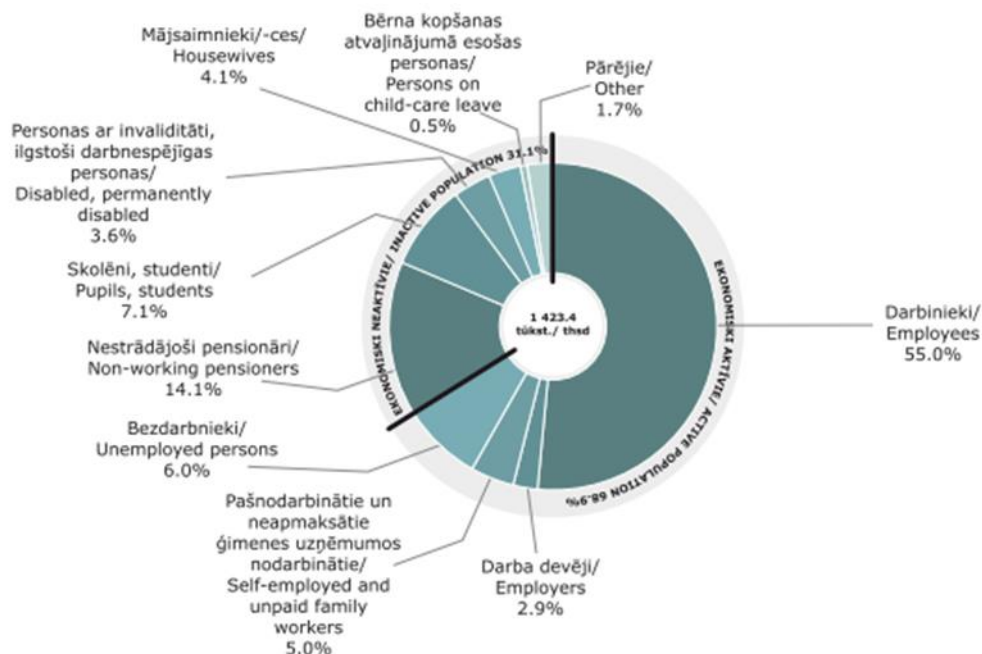
1. Labour market trends in Latvia

Labour market trends in Latvia depend on the number of working population. According to the statistics, only 55 % of all working population in Latvia were defined as employees, 7.1 % were pupils and students and 3.6 % were temporarily disabled and permanently disabled persons. The number of growing self-employed and unpaid family workers is slowly growing, which can be explained by the trend, that people want to work for themselves and do not want to depend on someone else.

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The trend of increasing non-working pensioners number is also slowly growing. Authors think that it depends on employers: younger employers are searching for younger and higher qualified employees, but employers with long experience are using also working capability of pensioners, because they have longer work experience and thus they could teach skills from their experience, which universities and colleges can't give to students. That is a very valuable opportunity, which is not used by every employer.



Source: Statistical Yearbook of Latvia, 2018

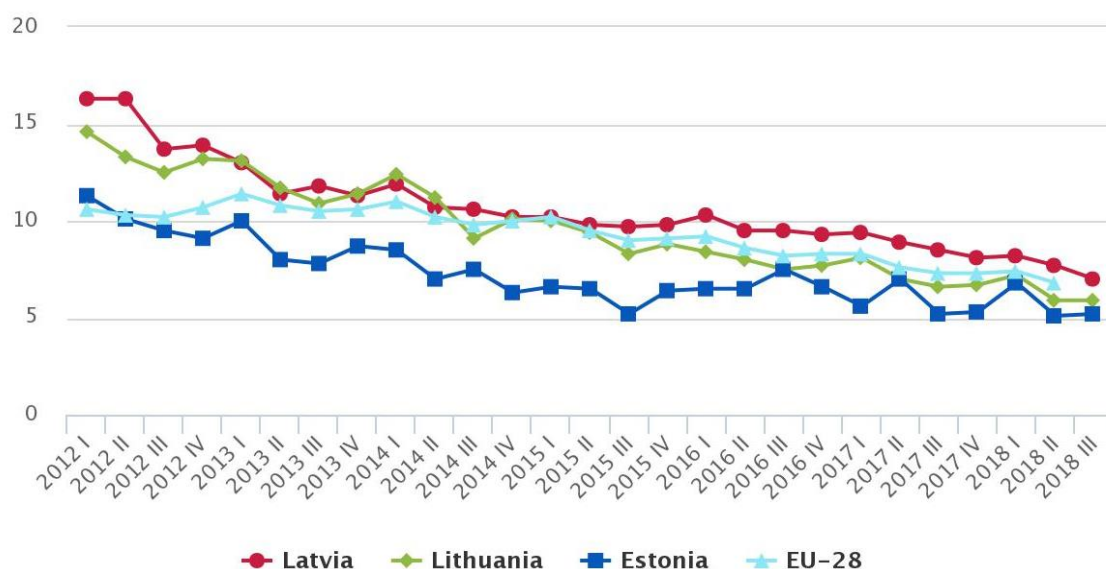
Fig. 1. Labour status of population aged 15-74 in Latvia 2017

The results of the Labour Force Survey conducted by the Central Statistical Bureau show that 920.1 thousand people or 65.3 % of Latvia's population aged 15-74 (incl.) were employed in the 3rd quarter of 2018. Over the year, employment rate grew by 1.7 percentage points and number of employed persons by 17.2 thousand. Compared to the previous quarter, employment rate grew by 0.9 percentage points and number of employed persons increased by 10.5 thousand (In the 3rd quarter..., 2018).

According to the medium - and long-term forecasts of the Ministry of Economic Affairs, the labour market situation will continue to improve gradually in the coming years – by 2022 the number of employees will increase by around 50 thousand, while the unemployment rate will fall to 6 % (Labour market medium, 2016).

In the 3rd quarter of 2018, the employment rate among young people (aged 15-24) constituted 36.2 %, which is 1.3 percentage points higher than in the corresponding period of 2017. Out of all young people, 62.7 thousand were employed (In the 3rd quarter..., 2018).

Results of the Labour Force Survey conducted by the Central Statistical Bureau show that in the 3rd quarter of 2018 Latvian unemployment rate constituted 7.0 %. Compared to the previous quarter, unemployment rate fell by 0.7 percentage points, while during the year it decreased by 1.5 percentage points (In the 3rd quarter..., 2018).



Source: Eurostat database, Labour Force Surveys of Latvia, Lithuania and Estonia

Fig. 2. Unemployment rate in the Baltic states and the European Union by quarter, as per cent

In the 3rd quarter, in Latvia there were 68.8 thousand unemployed persons aged 15-74 (incl.), which is 15.3 thousand people less than a year ago and 6.6 thousand people less than in the previous quarter (In the 3rd quarter..., 2018).

In 2015, Latvia changed the rules for the application of Unemployment Benefit. Until 2015, if a person had worked at least 12 months, he or she had unemployment benefit in 80 % of his six months' average wage, but after the changes in the law, the person can get just 50 % of one's average wage. Just those who had worked at least 30 years can apply for unemployment benefit in 65 % of average wage.

This is just one of the aspects that have also influenced unemployment rate in Latvia. The authors have observed that many people before applying for unemployment benefit, are hesitating if they need it or not, because the unemployment benefit is too low for their usual standard of living, they don't want to go to different employers for job search and also they are ashamed for the status of unemployed. Meanwhile, they are searching for different opportunities to work, and thus if they can't get jobs, they apply for status, in parallel working without contract of employment, thus getting paid by government and employer at the same time.

Table 1

Europe 2020 headline indicator – Employment, EU-28, 2008 and 2012 - 2016

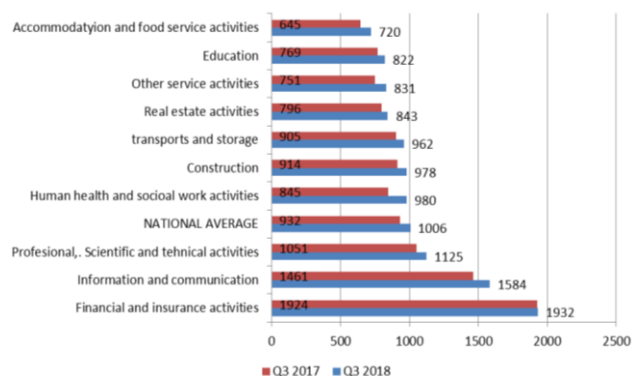
Topic	Headline indicator	2008	2012	2013	2014	2015	2016	Target
Employment	Employment rate age group 20–64, total (% of population)	70.3	68.4	68.4	69.2	70.1	71.1	75.0
	• Employment rate age group 20–64, females (% of population)	62.8	62.4	62.6	63.5	64.3	65.3	:
	• Employment rate age group 20–64, males (% of the population)	77.8	74.6	74.3	75.0	75.9	76.9	:

Source: Smarter, greener, more..., 2017

According to Europe 2020, in 2016 the Member States had commitment to reach employment of 75 % of population, but in Latvia it is just 65.3 %, which means, that Latvia still needs to change many different norms not just in entrepreneurial environment but also in regulatory enactments. Moreover, there is a need to take cardinal actions to increase the population of Latvia, because, based on the current statistics, there is a risk that in the future Latvian population can become extinct as a nation.

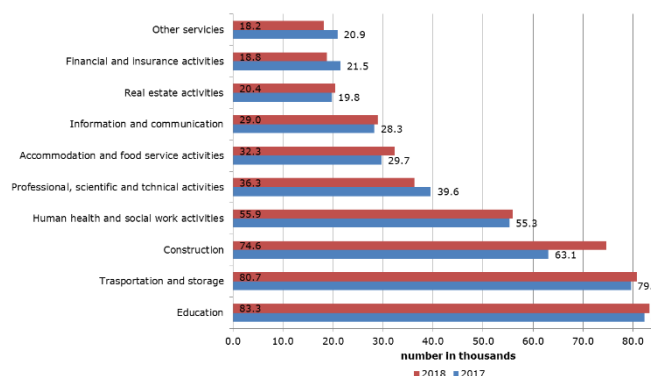
2. Labour market demand and supply for employees in different industries

Form 19 industries, just in six industries the wage is higher than the average salary in the overall country. If we compare the number of people who are working in these six industries basing on CSB data base, then in 2017 just 167.8 thousand of 894.0 thousand employees had higher than average wage in country, and in 2018 just 158.3 thousand of 905.7 thousand employees could be included in this group. So, it means that 81 % of employees in 2017 and 82 % of all employees in Latvia in 2018 received the average wage or salary in the particular industry, which generally was lower than the average salary in the overall country.



Source: In the 3rd quarter..., 2018

Fig. 3. Average monthly gross wages and salaries in Q3 2017 and Q3 2018 and changes thereof



Source: CSB statistics, 2018

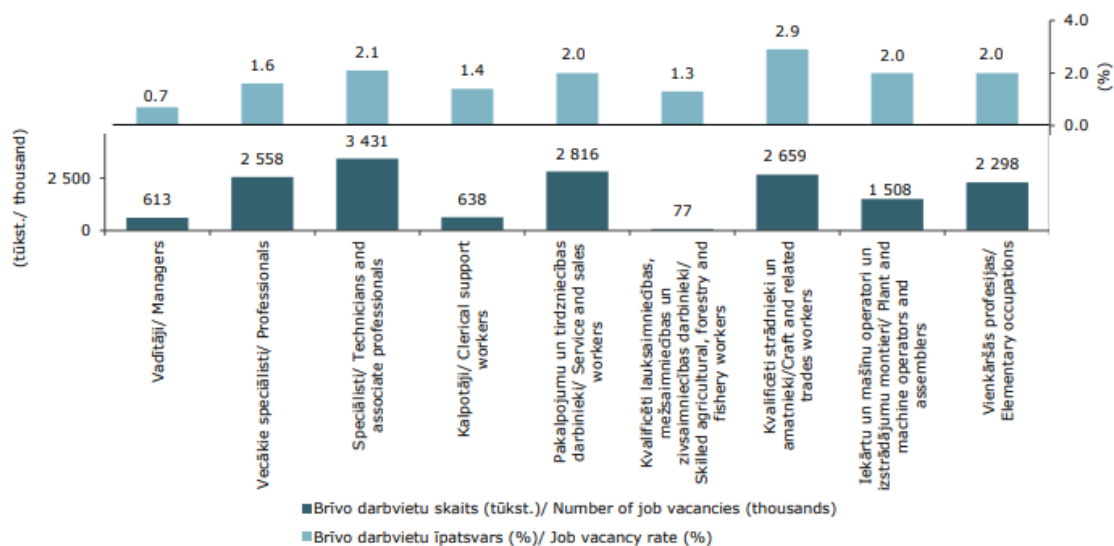
Fig. 4 Employees in Latvia by type of economic activity in 2017 and 2018, thousand

In the 3rd quarter of 2018, the highest wages and salaries for full-time work were registered in financial and insurance activities, information and communication, energy, public administration and defence, mining and quarrying, as well as professional, scientific and technical activities. In other sectors, the average wages and salaries before taxes were below the national average (In the 3rd quarter..., 2018).

The lowest wages and salaries, in turn, were observed in accommodation and food service activities, education, other service activities (that includes activities of public and other organisations, repair of computers and personal and household goods, washing and (dry-) cleaning, hairdressing and other beauty treatment, funeral and related activities), real estate activities, as well as arts, entertainment and recreation (In the 3rd quarter..., 2018).

The State Employment Agency, which is responsible for compiling the statistical data of job vacancies in the country, has claimed that at this moment the most needed jobs are in such specialities as technicians and associate professionals, service and sales workers, craft and related trade workers, elementary occupations. Considering, that people can earn salary that is under average salary in the country and consumer price index in last 2 years have increased from 101.7 to 106.4, more people choose higher-paid jobs, and lighter and lower paid jobs are only selected in extreme need.

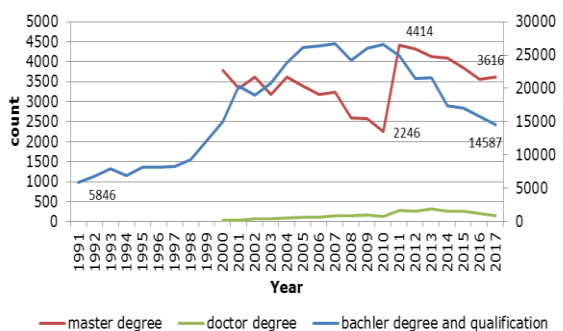
Jobs in financial and insurance activities, information and communication, energy, public administration and defence, mining and quarrying are not the ones where many advertisements can be found. These are sectors in which there are very many candidates in the case of vacancies, but they lack the qualifications or competence to carry out the jobs in question. Therefore, in these sectors, entrepreneurs are prepared to pay high salaries for employees, with a high degree of professionalism, responsibility and competence in the performance of the tasks entrusted.



Source: Statistical Yearbook of Latvia, 2018

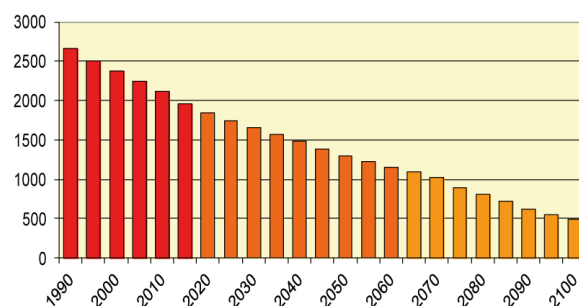
Fig. 5. Annual average number of job vacancies by major occupational grouping, 2017

In view of the lack of skilled labour in the labour market, employers are, as far as possible, supporting education institutions, technical education, job schools and higher education institutions, providing students with places of practice, the environment for research and, as far as possible, grants to the best students.



Source: Ministry of Education..., 2017

Fig. 6. Number of students graduating in Latvia in 1991-2017



Source: Helmane I., 2017

Fig. 7. Decrease in Latvia's population (thousands) in 1990-2010 and forecasts by 2100 without immigration

However, in view of the shrinking population in Latvia and the shrinking number of students at the different levels of education, it is concluded that the shortage of skilled labour will only increase in the coming years, which will create further problems in the labour market, both in terms of wage policy in companies and in the performance of quality work and in the labour market as a whole.

According to the report of the head of the International Migration Organization's Riga office Ilmars Mezs, the problems in Latvia could arise due to both the age structure and the numerical composition of the population. „In terms of sustainability, it will be very difficult with human resources. In the future economy, the problem will be the high proportion of seniors and the relatively small number of working people,” explained demographer. „If now, by very approximate estimates, there are two workers per retiree, then with time that ratio will be 1:1” (Helmane I., 2017).

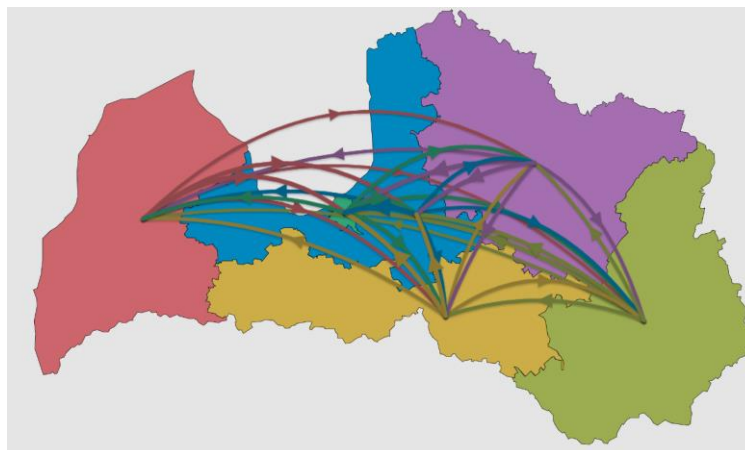
The optimistic forecast of Eurostat, assessing the decline in Latvia's population from 1990 to 2010 and forecasts by 2100, predicts that in 2050 Latvia will have a population of around 1.3 or 1.4 million, but after 83 years, if potential immigration is not taken into account, 500 000 people will live in our country alone. Mathematically estimated, the number will decrease by around 18,000 inhabitants each year (Helmane I., 2017).

3. Migration impact on labour market supply of employees

The optimistic forecast of Eurostat, assessing the decline in Latvia's population from 1990 to 2010 and forecasts by 2100, predicts that in 2050 Latvia will have a population of around 1.3 or 1.4 million, but after 83 years, if potential immigration is not taken into account, only 500 000 people will live in our country. The mathematical estimates suggest that the population will decrease by around 18 000 each year (Helmane I., 2017).

The professor's findings suggest that the average share of vacancies in all professions currently is 1.6 % (14 445 jobs), which is slightly lower than the EU average of 1.8 %. Therefore, the situation on the labour market could not be judged to be extremely severe. This is also reflected in a survey by the Central Statistical Bureau, in which only 14 % of manufacturing operators replied that labour shortages were a problematic factor (Helmane I., 2017).

Moreover, statistics show that there are no shortages of professionals in one particular profession, but different types of professionals, both with good education and simple professionals. When compared by sector, high vacancy rates, above 4 %, are in public administration, air transport and the manufacture of computers, electronic and optical equipment. In particular, there is a shortage of veterinary service providers, with a vacancy rate of 12.5 % (Helmane I., 2017).



Source: Map of migration... source? www.....

Fig. 8. Map of migration in Latvia 2000-2018

Between 2000 and 2018, the population changes are -24 %, with 7.5 % remaining in other regions. In Zemgale, the population changes are -20.9 %, while 10.8 % have travelled to other regions. Latgale has a population change of -30.0 %, with 6.9 % leaving for other regions. Vidzeme has a population change of -25.9 %, with 11.5 % leaving. In Pierīga, the population changes are 1.5 %, with 12.4 % left in other regions. In Rīga, the population changes are -16.4 %, with 9.7 % left in other regions.

The largest number of emigrations is from Pierīga to Rīga 31206. For example, there are 16572 emigrating persons from Latgale to Rīga during this period.

From 2000 to 2018, the migration flows are mostly to or from Rīga. For the purposes of this map, the origin/destination of the migration flow is mainly the cities of the republic significance.

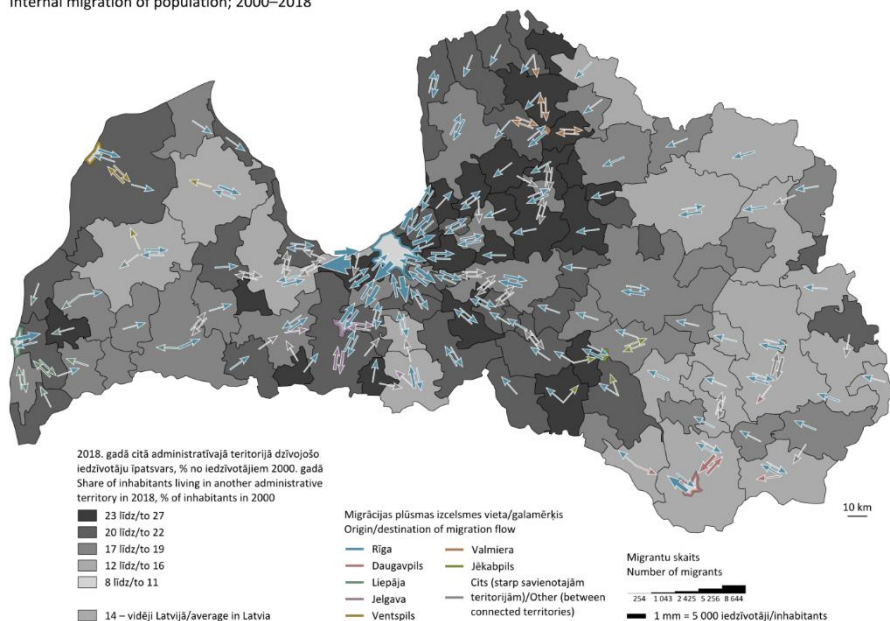
The data from the CSB also show that the population in Pierīga is increasing. In the view of the regions, the population annually increased only in Pierīga, i.e. by 2300 inhabitants or 0.6 %. According to the CSB, the main cause of the increase is internal migration, but the indicator of natural movement in Pierīga has been positive during the last three years (We are even..., 2018).

The largest decrease in population is still seen in Latgale – by 5400 or 2.0 %, however it is 0.3 % less than in 2016. Meanwhile, the population in Vidzeme has decreased by 3300 (1.7 %), also in Kurzeme it decreased by 3300 (1.3 %), in Zemgale – by 2700 (1.1 %) and in Rīga - by 3500 (0.5 %). In the analysed period, one third or 33 % of Latvian residents lived in Rīga (We are even..., 2018).

The CSB points out that the population has fallen in seven of the nine cities of the republic. Positive figures were in Jūrmala in 2017, with population growth of 1.0 % or 467 people and 0.4 % or 102 in Valmiera. The population decreased most in Ventspils – by 1.4 % or 507 people, in Daugavpils – by 1.6 % (1342), in Jekabpils – by 1.0 % (224), while the least – in Rēzekne – by 0.1 % (18) (We are even..., 2018).

Instead of migrating abroad, Latvian residents of working age will continue to migrate from rural areas to cities, particularly to Rīga and Rīga region, where there are opportunities for higher wages and opportunities for more professional growth. However, it is expected that a higher GDP growth rate – around 5 % – and a 50 % lower income gap between Rīga/Pierīga and regions could slow Latvia's internal migration (Demographic Portrait of..., 2017).

Iedzīvotāju iekšzemes migrācija; 2000–2018
 Internal migration of population; 2000–2018



Source: *Internal migration of..., 2018*

Fig. 9. Internal migration of population in 2000–2018

For domestic migration, it is important to understand the motives for resettlement. The main reason is mostly aspiration to improve personal living conditions. Therefore, the change of residence is linked to job search or education, finding a cheaper place of residence, purchasing a dwelling or reasons related to the environment of life. Accordingly, the migration to cities in Latvia is linked to population's activity in the labour market and to the extensive educational opportunities in the cities. In contrast, suburban movements are linked to people's desire to improve housing conditions and to live in a quieter and more attractive environment, or closer to nature. In this context, highly geographic mobility in Latvia is typical for young people who go to learn and seek better work, followed by higher levels of education and better professional qualifications in line with the needs of the labour market.

Conclusions, proposals, recommendations

- 1) Publicly available information suggests that the statistic of the labour market development are comply with the real situation in Latvia. However, the statistics reflecting the number of employees in particular industries of the labour market does not reflect the real situation in Latvia. Moreover, as much as 82 % of all employees in Latvia receive less than average wage in country.
- 2) Employers' demand for employees with higher education, higher qualification and competencies is increasing, thus employers are ready to pay higher wage than currently offered in Latvia, so employees in financial and insurance activities, information and communication, energy, public administration and defence, mining and quarrying industries receive the wage that is higher than the average wage in Latvia. In these industries there are many people who want to get jobs in these industries and can demand higher salary for their qualifications and competencies.
- 3) According to the migration analysis, one can observe that the cities which are far from Riga have less population than in Riga and Pieriga. Rural regions are getting less inhabited, because youth

are searching for jobs with higher wages and opportunities, and only those young people whose parents started their own business in home-places like farms are continuing the family business.

Bibliography

1. CSB statistics (2018). Retrieved: https://data1.csb.gov.lv/pxweb/lv/sociala/sociala__nodarb__nodarb__ikgad/NBG081.px. Access: 20.02.2019.
2. *Darba tirgus videja un ilgtermiņa prognozes (Labor market medium and long term forecasts)* (2016). Retrieved: <https://www.em.gov.lv/lv/aktuali/10556-darba-tirgus-videja-un-ilgtermiņa-prognozes>. Access: 04.02.2019.
3. Helmane, I. (2017). *Latvija 2100. gada varetu būt vien pusmiljons iedzīvotāju (In Latvia in 2100 could be only half a million population)*. Retrieved: <https://lvportals.lv/norises/286795-latvija-2100-gada-varetu-but-vien-pusmiljons-iedzivotaju-2017>. Access: 22.02.2019.
4. *In the 3rd quarter of 2018, Latvia's Employment Rate Constituted 65.3 %* (2018). Retrieved: <https://www.csb.gov.lv/en/statistics/statistics-by-theme/social-conditions/unemployment/search-in-theme/2423-employment-3rd-quarter-2018>. Access: 04.02.2019.
5. *In the 3rd quarter of 2018, Latvia's Unemployment Rate Constituted 7.0 %* (2018). Retrieved: <https://www.csb.gov.lv/en/statistics/statistics-by-theme/social-conditions/unemployment/search-in-theme/2427-unemployment-3rd-quarter-2018>. Access: 04.02.2019.
6. *In the 3rd quarter, Average Earnings Constituted EUR 1 006* (2018). <https://www.csb.gov.lv/en/statistics/statistics-by-theme/social-conditions/wages/search-in-theme/2386-changes-wages-and-salaries-3rd-quarter-2018>. Access: 20.02.2019.
7. Internal Migration of Population; 2000–2018 (2018). Retrieved: <https://www.csb.gov.lv/en/statistics/statistics-by-theme/population/migration/search-in-theme/367-internal-migration-population-2000-2018>. Access: 20.02.2019.
8. Latvijas demografiskais portrets šodien ...un rit (Demographic Portrait of Latvia today... and tomorrow) (2017). Retrieved: http://certusdomnica.lv/wp-content/uploads/2017/05/Certus_LatvijasDemografiskaisPortrets_2017_LV-1.pdf. Access: 20.02.2019.
9. *Latvijas statistikas gadagramata, 2018 (Statistical Yearbook of Latvia 2018)* Retrieved: [https://www.csb.gov.lv/sites/default/files/publication/2018-12/Nr_01_Latvijas_statistikas_gadagramata_2018_Statistical %20Yearbook %20of %20Latvia_ %2818_00 %29_LV_EN.pdf](https://www.csb.gov.lv/sites/default/files/publication/2018-12/Nr_01_Latvijas_statistikas_gadagramata_2018_Statistical%20Yearbook%20of%20Latvia_%2818_00%29_LV_EN.pdf). Access: 04.02.2019.
10. Map of Migration in Latvia 2000-2018. Retrieved: <https://migracija.csb.gov.lv/>. Access: 20.02.2019.
11. Ministry of Education and Science (2017). *PARSKATS par Latvijas augstāko izglītību 2017.gada (REPORT about Higher Education in Latvia in 2017)*. Retrieved: https://www.izm.gov.lv/images/statistika/augst_izgl/AII_2017_parskats.pdf. Access: 20.02.2019.
12. Musu ir vēl mazāk. Publicē jaunākos datus par iedzīvotāju skaitu Latvijā (We are even less. Publish the latest data on population numbers in Latvia) (2018). Retrieved: <http://www.la.lv/musu-ir-vel-mazak-publice-jaunakos-datus-par-iedzivotaju-skaitu-latvija> Access: 20.02.2019.
13. *Smarter, Greener, More Inclusive? INDICATORS TO SUPPORT THE EUROPE 2020 STRATEGY* (2017). Retrieved: <https://ec.europa.eu/eurostat/documents/3217494/8113874/KS-EZ-17-001-EN-N.pdf/c810af1c-0980-4a3b-bfdd-f6aa4d8a004e>. Access: 06.02.2019.

INNOVATIONS IN DEVELOPMENT OF PERIPHERAL REGIONS

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Abstract. In this article, based on a case study of peripheral region in Poland, the meaning of innovations in regional development was discussed. Empirical studies were made by the usage of diagnostic survey. It consisted of the representative group of business entities localized on the studied area. They were referred to, in chosen aspects of innovative activity which was: level of innovativeness of enterprises, plans of implementation of innovations in future, influence of innovations in operation of enterprises and the most important barriers of conduction of innovation activity. They take into consideration the meaning of external factors influencing the innovativeness of enterprises and regions, it was also rated the possibilities of usage of the sources from the funds of EU by studied entities.

Key words: innovativeness, business entities, regional growth, peripheral regions.

JEL code: R11, R19.

Introduction

Economic development² of international groups, countries or regions depends from many factors. Theoretical conceptions and empirical studies emphasize among them above all (besides „classical“ growth factors) innovations and resulting from its implementation, the level of innovativeness of enterprises and territorial units. Theoretical connection between innovativeness and economic growth was considered early by Adam Smith. He did highlight that work productivity consist of speciality and division of work (enabling the usage of more efficient machines and devices, and the growth of qualifications of workers). Consequently, it contributes to the bigger wealth of nations (Smith, 1776). Meaning of the innovations in economic development was also seen by List (1856). He stated that the production potential depends not only on natural resources but also on the non-material capital. The concept of innovation was introduced at the beginning of XX century by Joseph A. Schumpeter (1939). He did highlight that innovations are the main factor of growth and basis of business cycle. According to him the economic growth is the result of new combinations of production means (Schumpeter, 1960). He stated that that entrepreneur who is active is making two types of changes. He withdraws the existing products, changes the way of acting, production and transport forms, forms of organization to introduce the brand new which is the process called „creative destruction“. New actions are to develop the growth of production, sale and profit. It leads to the development of enterprise. The essence of the business of entrepreneur is to create the innovations which are contributing to the economic development. Borts and Stain (1964) as well with Richardson (1973) took notice that technological innovations are an exogenous factor in the economic development of the regions. An important scientific concept about the studies of the connection between innovativeness and regional growth is the model of economic development proposed by Porter (1960). In consist of 3 phases: growth drawn by basic production factors (factor-driven), development based on investments (investment-driven) and development based on innovations (innovation -driven). Author did highlight however that the ability for the assimilation is the basic factor of diversity of competitiveness of regions and the source of differences in their economic development. Modern theoretical conceptions (ex. Lundvall, Johnson 1994, Freeman 2006, Soete

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² economic development includes, besides quantitative changes in basic macroeconomic values, the quality changes, which may be defined as a civilization progress; it was assumed that it means achieving a sustained growth rate of per capita income to enable the nation to expand its production at a rate faster than the rate of population growth (Todaro, Smith, 2012).

2008, Freeman and Soete, 2009) emphasize even more the necessity of including the innovations in shaping of the diversity in regional development.

Theoretical connections between innovativeness and economic growth are confirmed by empirical studies¹. Results of considerations of factors of economic growth of EU countries (*Sprawozdanie...*, 2018) point out that among previous decades it was a result (mainly, about two thirds) from the innovative activity. Europe which is inhabited with only 7 % of world population generates about 20 % of world investments in research and development, publishes one third of world high class scientific publications and has a dominant position in such industries as: pharmacy, chemicals, mechanical engineering and fashion. The report shows also that expenditures on public investments for innovative activity in EU are below target level of 3 % of GDP and are unevenly distributed between EU regions with its highest concentration in Western Europe. It is also accentuating the necessity of support the less developed countries of EU in their efforts to usage all of the national potential in a range of scientific studies and innovations on a regional basis. Regional aspect of innovative activity is also highlighted in many modern elaborations about such issues (Asheim et.al, 2006, Koschatzky, 2006). Klepka (2005) sees that the growing meaning of regional approach in creation of innovations results from the spatial dependencies and their surroundings. Adds also that it is caused by nearness from the one side and from the other, the bigger trust among partners coming from the same region, professing the same values and shaped by the same cultural factors.

In the policy of endogenic growth of regions, the particular role is played by the enterprises localized on their territory. Adamik (2013) points out that by the local dimension of their activity, they influence its growth. Olejniczak (2015) notices that the stable and long-term improvement of competitiveness of business entities relates to their innovative activity. It has a special meaning in case of peripheral regions, poorly developed. It was the premise to conduct a research, that the main aim was evaluation the innovative activity of enterprises working in braniewski county which is one of the less developed regions in Poland. Empirical studies were conducted using diagnostic survey with the use of questionnaire. It was addressed to the representative group of 220 subjects. After verifying of completeness of gathered data, the analysis was made based on 199 questionnaires. Structure of studied group was convergent with the real structure of enterprises, localized in the analysed region. In this study, the Focus was put on the most important issues connected with the innovative activity of the enterprises, mainly: information about the present innovative actions, plans of conduction of innovations, influence of innovations of functionality of enterprises and the most important barriers in the process of conducting the innovative actions. Attention was also paid on the possibilities of usage of aid funds from EU funds in creation of innovations. In this article created a thesis that the limited range of innovative activities of enterprises located in peripheral regions has a negative impact on their long-term development.

Research results and discussion

Manifestation of undertaken by industry enterprises innovative actions is innovative activity, which basic indicator is the percentage of innovative subjects in total number of enterprises. In conducted research 35 % of respondents declared that they realise the innovative actions in their enterprises. Most of them did not implement innovations. Poplawski and Polak (2011) highlight that

¹ some of the authors claim that it is not so clear; Denison (1962) points to the fact that significant expenditures on research and development causes only the mild, nothing significant benefits; Huebner (2005) shows that development by innovations, especially with breakthrough has stopped, and even ended; analyses presented in "The Economist" (2013) levers these hypotheses.

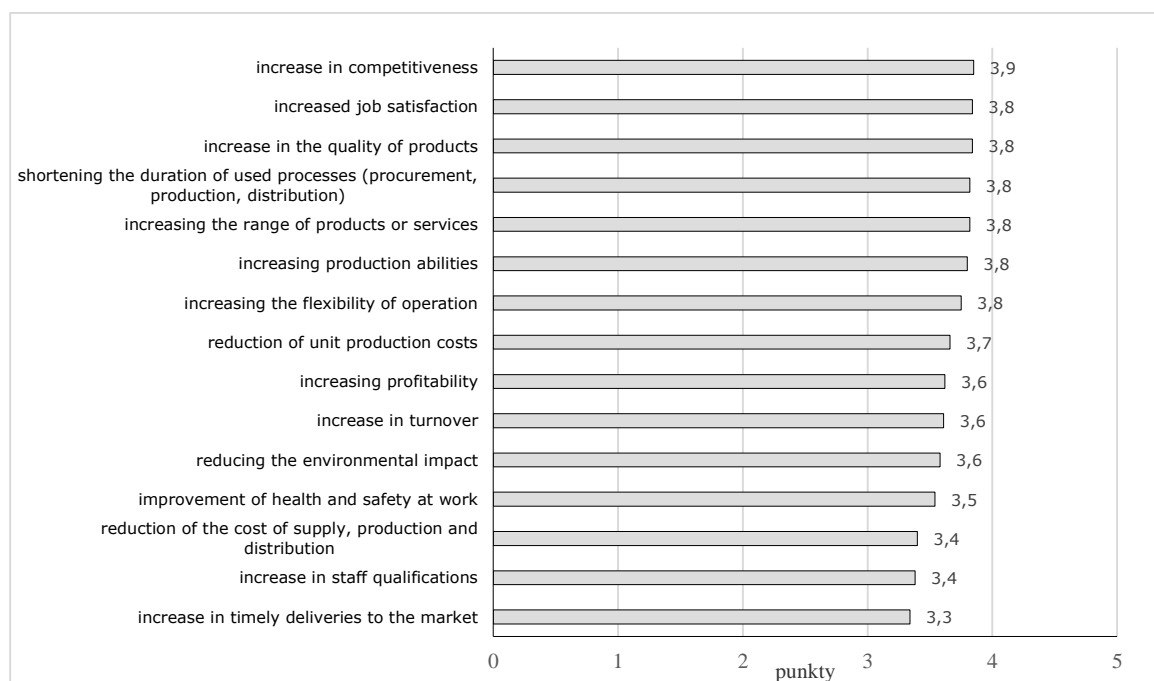
the lack of innovativeness significantly limits the competitiveness of enterprises and thus the possibilities of development of regions in which they are localized. It is also confirmed by previous studies of microenterprises localized in warminsko-mazurskie voivodeship (Decyk, 2015). Gathered by the author results show that with the growth of level of innovativeness of enterprises, their competitive position is getting better. Similar conclusions come from the studies of Sipa (2011). Lack of activity in terms of innovativeness in enterprises of braniewski county may in future limit their competitive position. This also results from the report of Ministry of Enterprise and Technology in which it was stated that *„polish enterprises are subjects which are less and less innovative, involving actively in research-development works and more and more willing to establish cooperation”* (Przedsiębiorczosc..., 2018). These analyses point out also the growing tendency for taking the risk by enterprises which is a complementary element of innovative activity. Goksoy and others (2013) indicate that running an innovative business is connected with two most important aims of betterment of enterprises competitiveness – improvement of product quality and technological quality. Consequently, innovations are factor which enable the correction of their productivity and ability of adaptation to the changing market conditions. It should be connected with the high indicators of entrepreneurship rate and establishment of new enterprises. Entrepreneurship indicator in the braniewski county determined by number of subjects inscribed in REGON registry in conversion on 10 thousand of people in general and 10 thousand people in productive age was slightly smaller than in warminsko-mazurskie voivodeship but significantly smaller than in comparison with the regions which are most developed in Poland¹. It relates to the economic structure of analysed region, resulting from the scale of conducting the economic activity and the branch structure of analysed subjects. They were entities classified mostly to the sector of micro-, small and medium enterprises, low technology and acting on the local scale. In such context, the intensity of structural changes leading to the creation of economy of knowledge should depend from the initial level of development of region economy. It means that there should be two types of recommendations, one for the regional policy in developed regions and the second for the others. Hospers (2005) adds that when supporting traditional sectors does not seem a viable solution maybe a recombination of the „old” with the „new” could create a more appropriate direction of policies.

Type of introduced innovations reflects the strategy of competition accepted by the enterprise. Innovations which are realized in braniewo county are mostly technological (66,7 % of indications) and/or product (59,4 %). It is visible the limitation of organizational innovations which should be particularly significant in smaller enterprises. Usually in smaller economical subjects there is a bigger dynamism of action, better motivation to work, flexibility and high market orientation (market niche strategy). Companies such as this are established by inventors, being characterized by simple organizational structures with non-formal bonds and fast communication. Results of studies are convergent with the one from the scale of the whole country. According to the latest studies about innovativeness economic subjects in Poland (*Dzialalnosc innowacyjna...*, 2018) it follows that the biggest meaning had the process and product innovations.

Disturbing is the fact that nearly 58 % of entrepreneurs from braniewo county do not plan the innovative actions in the future. As a source of such doing, the entrepreneurs were saying that there is No need to conduct any new innovative solutions. According to the data presented in the report of National Polish Bank (*Potencjal innowacyjny...*, 2016) it is the main premise not to conduct future

¹ <https://bdl.stat.gov.pl>

innovative actions by the economic subjects, not only from braniewo country but in the whole country. In the context of very low level of innovativeness in Poland and its various regions it is a very unfavourable phenomenon. It is worth to mention however the high level of awareness of entrepreneurs about the benefits coming from innovations (Figure 1). Representatives of the companies from the braniewo country in the first place highlight that innovations influence the level of competitiveness of their companies. Innovations have also a favourable (motivational) influence on the growth of satisfaction from work with innovative products and technologies and within the innovative system of production (services). Similar level of evaluation was also obtained by the consequences of such innovative actions as: growth of product quality, reduction of time of used processes (supply, production, distribution), increase of the proposed assortment of products or services, enhancement of production abilities, increase of the level of flexibility of operation. With the innovations, entrepreneurs also associate main economic categories such as: opportunity for lowering the unit costs of production, increasing profitability of conducted activity, increase in turnover. Entrepreneurs also pay attention to the elements which are in less grade direct economic goals of their companies, being also the relevant effects of innovative actions ex.: reduction of harmfulness to the environment, improvement of health and safety at work. According to the respondents the lowest influence of innovations has on the increase in timely deliveries to the market, reduction of the cost of supply, production and distribution, and increase of personnel qualifications.

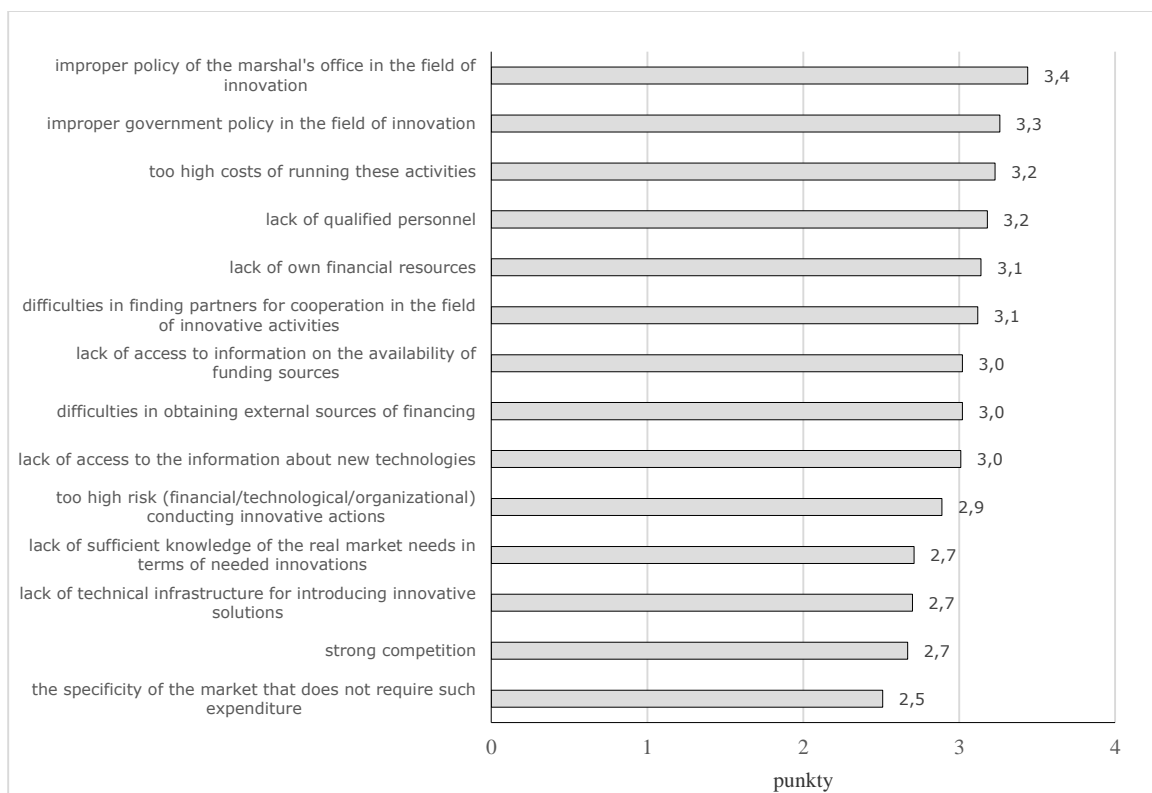


Source: author's elaboration

Fig. 1. Influence of innovations on the elements of enterprise functioning
 (1 – low, 5 – vary big) (average of points)

The most important obstacles in conducting the innovation activity which were pointed out by entrepreneurs from braniewo county are among many the wrong policy of marshal's office and government in the field of innovation (Figure 2). The owners of the enterprises did evaluate negatively the too high costs of conducting the innovative actions. It was pointed out also on the fact of lack of qualified personnel and the lack of enough financial resources. In the range from 3,2 to 3,0 point were evaluated also: difficulties in finding the partners for cooperation in range of innovative activity, lack of access to the information about new technologies, difficulties in gaining the external

sources of funding, lack of access to the information about availability of funding sources. Less critically, was approached to the high level of risk (financial, technological, organizational) taking innovative actions. In the group of the least important obstacles in running an innovative business, the respondents gave answers: specification of market which do not require incurring expenditures, strong competition, lack of technical infrastructure for introduction the innovative solutions, lack of sufficient recognition of real market needs in terms of needed innovations.



Source: author's elaboration

Fig. 2. The most important barriers in running innovative activity
 (1 – low meaning, 5 – vary big meaning) (average of points)

The source of funding of innovative activity within the analysed enterprises was among others own sources (80 % of indications). In such context the relevant is evaluation of possibility of usage by companies the aid funds from many types of EU funds. The biggest group of entrepreneurs (27 %) was applying for help under Regional Operational Program Warmia and Mazury. This program concentrates on the warmian-masurian economy and education of staff, enhancement the situation on the labour market, increasing the availability to the public services, overcoming the region's energy exclusion, improving the quality of the natural environment, filling gaps in the transport system, revitalizing cities and reducing poverty in the region. Some over 16 % of respondents pointed out with an interest to the support programs realized by labour office. Such programs have mostly activation and supportive character of employment by the one who are looking for work in various regions. Programs which aim is to develop activity of the companies, did support mainly the investment needs, consisting of: buying the new equipment, infrastructure development and so on. These expenditures do not have to be connected with big innovations but should be a part of developing the production or range of the services and influence in positive way on the competitiveness of the company within the market. They occurred mainly in the form of loans. Interest in such programs of support was declared by some over 15 % of studied entrepreneurs from braniewo county. Another important program of EU, which was also in an interest of braniewo county

companies was the program called Knowledge Education Development Program (some over 12 % of indications). This program aim is to support above all the activation of young people, higher education, society innovations, mobility and transnational cooperation, as well with the reforms in areas of employment, social inclusion, education, health and good governance. Efficient and effective usage of external funds should be priority for both growing enterprises which want to develop and the local government to take care of general conditions for the socio-economic development of the region. According to the opinion presented by entrepreneurs, the big meaning has efficiently working institutional system, which in significant part is responsible for usage of the EU funds. Most often accented barriers connected with gaining the EU funds by entrepreneurs from braniewo county were excessive bureaucracy and formalization of proposals and limited access to the information about the programs. Efforts for EU assistance was also impeded by the lack of information about the possibility of usage and the range of support programs as well, the cost of developing the application. Presented data confirms the thesis by Todtling'a and Trippl (2005), who state that in peripheral regions there is a low level of absorption of public funds for innovations. Oughton and others (2002) define it as „regional paradox of innovations“. It refers to apparent contradiction between higher need of expenditures on conducting the innovative processes in less developed regions and their relatively small ability to use the public funds for investment in innovations compared to the more advanced regions.

Conclusions, proposals, recommendations

- 1) Conducted analyses point out the fact of small range of innovative activities done by the economic subjects which are localized in studied region. In such context we may assume their limited influence for its long-term development.
- 2) Analysed enterprises are more interested in gaining the material technology (process innovations) than in generating or gaining fresh knowledge. It can be understood as in context, when trying to overcome technological gap which can divide regional and national companies from the enterprises that are from high developed countries. Such actions are rational as the economic growth of peripheral regions is determined by the scale of adaptation and implementation of new technologies used in leading regions and countries.
- 3) Disturbing fact is the one, that people are not interested in foreign capital in funding the innovative activity, besides the fact that lack of it is pointed out as one of the main barriers of implementing the innovations. It is caused by the lack of tradition of investing in innovative activity of economic subjects localized in peripheral regions and their small interest in gaining the funds from EU.
- 4) Unfavourable phenomenon is the lack of participation of studied enterprises in regional systems of innovations resulting from the limited trust to the public government, both at national and regional level. Inappropriate policy of the Marshal's Office and the government in the field of innovative activity are pointed out as two, main barriers which are limiting the conduction of innovations in business entities.
- 5) Regardless of subjectivity of pointed by the respondent's sources of limitation of innovation implementation, it must be highlighted that the innovative policy at the national and regional level (especially in peripheral regions) is the main impulse for the changes in this area. It means that in case of proper support from the point of institutional surroundings, it is possible to

develop the innovative actions of business entities and as a consequence their bigger influence on regional growth.

- 6) Regarding to the activities taken by the enterprises it should be mentioned among other, the necessity of proper preparation of innovation strategies of individual organizational units (innovations in practice often have limited range and more even more often they result from the current economic situation rather than from strategic analyses). Enterprises should not consider only the changes against the background of competitors, but as well with the elements which favour more dynamic innovative activity that can be the bigger mutual integration of business entities with other enterprises or other subjects from their surroundings.
- 7) In case of regional innovative policy, it should be strived to the bigger usage of institutional relations for implementation of the innovative strategies. In this context it is worth to take notice for the disturbingly weak focus on the use of technical and economic consulting by the owners of studied enterprises and the cooperation with institutions of local government units. Using the perceived awareness of respondents, that the building of competitive advantage on the market should be based on quality actions connected with implementation of innovations, the support is needed from the institutional environment. It may in long-term perspective strengthen the perspectives of development of various regions.
- 8) Summarizing the conducted considerations, it is needed to highlight that both the level of development of peripheral regions and the level of innovativeness of enterprises which are located within them is determined by economic structures. It results from many factors, which are: natural, social or historical conditions. In most of them there are sectors and branches of so-called low technology which are naturally less innovative. It does not mean however that they should be not implementing the innovations, but when it comes to the comparison analyses (which always have relative character) we should examine the results with some caution.

Bibliography

1. Adamik, A. (2013). *Rola współpracy międzyorganizacyjnej MSP w procesach kształtowania konkurencyjności regionu na przykładzie firm regionu świętokrzyskiego*. Studia i Materiały. Miscellanea Oeconomicae Uniwersytetu Jana Kochanowskiego w Kielcach. No. 1, pp. 25-38.
2. Asheim, B.T. et al. (2006). *Constructing Regional Advantage: Principles-Perspectives-Policies*. Report of DG Research Expert Group on Constructing Regional Advantage, European Commission, Brussels.
3. Borts, G.H., Stein, J.J. (1964). *Economic Growth in a Free Market*. New York, Columbia University Press.
4. Decyk, K. (2015). *Innowacyjność a pozycja konkurencyjna mikroprzedsiębiorstw*. Przedsiębiorczość i Zarządzanie, T. XVI, Zeszyt 7, Część II, pp. 89-99.
5. Denison, E.F. (1962). *The Sources of Economic Growth in the United States and the Alternatives before Us*. Committee for Economic Development, New York.
6. *Działalność innowacyjna przedsiębiorstw w latach 2015-2017*. (2018). Główny Urząd Statystyczny, Urząd Statystyczny w Szczecinie.
7. Freeman, Ch. (2006). *Catching-up and Innovation Systems: Implications for Central and Eastern Europe*. W: Piech K., Radosevic S. (red.), *The Knowledge-Based Economy in Central and East European Countries: Countries and Industries in a Process of Change*. Basingstoke (UK) – New York, Palgrave-Macmillan.
8. Freeman Ch., Soete L. (2009). *Developing Science, Technology and Innovation Indicators: What We Can Learn From the Past*. Research Policy, Vol. 38, No. 4, pp. 583-589.
9. Goksoy, A., Vayvay, O., Ergenel, I.N. (2013). *Gaining Competitive Advantage through Innovation Strategies: An Application in Warehouse Management Process*. American Journal of Business and Management, Vol. 2, No. 4, pp. 304-321.
10. Gryczuk, A., Russel, P. (2011). *Polityka innowacyjna w Polsce w ujęciu krajowym i regionalnym*. W: Zygierewicz A. (red.), *Innowacyjność polskiej gospodarki*. Wydawnictwo Sejmowe Kancelarii Sejmu, Warszawa.
11. *Has The Ideas Machine Broken Down?* (2013). „The Economist”, January 12, <http://www.economist.com/news/briefing/21569381-idea-innovation-and-newtechnology-have-stopped-driving-growth-getting-increasing> (accessed: 17.02.2019).

12. Hospers, G.J. (2005). *Best Practices and the Dilemma of Regional Cluster Policy in Europe*. Tijdschrift voor Economische en Sociale Geografie, Vol. 96, No. 4, pp. 452-57.
13. Huebner, J. (2005). *A Possible Declining Trend for Worldwide Innovation*. Technological Forecasting & Social Change, Vol. 72, No. 8, pp. 980-986.
14. Klepka, M. (2005). *Efekty regionalnych strategii innowacji w Polsce. Rekomendacje do analizy szczegółowej*. Raport. PARP, Warszawa.
15. Koschatzky, K. (2006). *The Regionalization of Innovation Policy: New Options for Regional Change? In: Fuchs G, Shapira P., Rethinking Regional Innovation and Change-Path Dependency or Regional Breakthrough?* Springer Netherlands, pp. 291-312.
16. List, F. (1856). *National System of Political Economy*, J. B. Lippincott & CO., Philadelphia.
<https://archive.org/stream/nationalsystemof00listrich#page/n7/mode/2up> (accessed: 12.02.2019).
17. Lundvall, B., Johnson, B. (1994). *The Learning Economy*. Journal of Industry Studies, Vol. 1, No. 2, pp. 23-42.
18. Olejniczak, K. (2015). *Wspieranie innowacyjności małych i średnich przedsiębiorstw w Szwajcarii*. W: Bielawska A. (red), *Uwarunkowania rynkowe rozwoju małych i średnich przedsiębiorstw. Mikrofirma 2015*. Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin.
19. Oughton, C., Landabaso, M., MORGAN K. (2002). *The Regional Innovation Paradox: Innovation Policy and Industrial Policy*. Journal of Technology Transfer, Vol. 27, No. 1, pp. 97-110.
20. *Potencjał innowacyjny gospodarki: uwarunkowana, determinanty, perspektywy*. (2016). Raport Narodowego Banku Polskiego.
21. Popławski, L., Polak, M. (2011). *Innovativeness in Regional Development: Selected Problems*. The Malopolska School Of Economics in Tarnow Research Papers Collection, Vol. 19, ISS.2, pp. 107-116.
22. Porter, M. (1990). *The Competitive Advantage of Nations*. New York, Basic Books.
23. *Przedsiębiorczość w Polsce*. (2018). Ministerstwo Przedsiębiorczości i Technologii, Warszawa.
24. Richardson, H.W. (1973). *Regional Growth Theory*. London, Macmillan.
25. Schumpeter J.A. (1939). *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. McGraw-Hill Book Company, New York, Toronto, London.
26. Schumpeter, J.A. (1960). *Teoria rozwoju gospodarczego*, PWN, Warszawa.
27. Sipa, M. (2011). *Specyfika działalności małych przedsiębiorstw o zroznicowanym poziomie innowacyjności i konkurencyjności*. W: Bielawska A. (red), *Uwarunkowania rynkowe rozwoju mikro, małych i średnich przedsiębiorstw - Mikrofirma 2011*. Tworzenie i Zarządzanie. Wyd. Naukowe Uniwersytetu Szczecińskiego, Szczecin.
28. Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*, „Glasgow Edition of Works”, Vol. 2. http://files.libertyfund.org/files/220/Smith_0141.02.pdf (accessed: 28. 01.2019)
29. Soete, L. (2008). *Science, Technology and Development: Emerging Concepts and Visions*. UNU-MERIT Working Paper, seria 001,. United Nations University, Maastricht Economic and Social Research and Training Centre on Innovation and Technology.
30. Solow, R.M. (1957). *Technical Change and the Aggregate Production Function*. Review of Economics and Statistics, Vol. 39, No. 3, pp. 312-320. <http://www.jstor.org/stable/1926047> (accessed: 28. 01.2019)
31. *Sprawozdanie nt. europejskiego rankingu innowacyjności i innych inicjatyw KE związanych z innowacyjnością*. (2018). Bruksela.
32. Todaro, M.P., Smith S. C. (2012). *Economic Development*. Addison Wesley, Boston.
33. Tödtling, F., TRIPPL M. (2005). *One Size Fits All? Towards a Differentiated Regional Policy Approach*. Research Policy, Vol. 34, No. 8, pp. 1203-1219.

RATINGS OF CONSUMER SATISFACTION: THE CASE OF BBS-DIZAIN LTD

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Abstract. Entrepreneurship is based on meeting customer needs, which allows achieving the goals of the enterprise. In this process, the enterprise and the customer have their own goals they want to achieve: one of the goals of the enterprise is to attract and retain customers, whereas the customer wishes to purchase a product at the necessary place, time and quality and receive customer service of a wished quality.

The authors conducted a survey of internal and external customers of BBS-Dizain Ltd with the aim of identifying their satisfaction level according to quality criteria for the assortment of the enterprise's services and the imperfections to be eliminated.

The research determined the most important components of restaurant customer service for the customers of BBS-Dizain Ltd and the customer satisfaction level and made proposals for enhancing some of the components.

Key words: customer, satisfaction, quality.

JEL code: M210.

Introduction

Entrepreneurship is based on meeting customer needs, which allows achieving the goals of the enterprise. In this process, various relationships emerge between the enterprise and the customer, yet both sides have specific goals they pursue: the enterprise wants to attract and retain customers and increase its turnover, market share and profit, while the customer wishes to purchase a product at the necessary place, time and quality and receive customer service of a wished quality. The relationships are based on mutual gains. According to research investigations, attracting a new customer costs 5-10-fold more than selling the product to the current customer; besides, the current customer spends 67 % more money than a new one does. Accordingly, meeting consumer needs is a priority for the enterprise (Linina, 2018).

The management of BBS-Dizain Ltd wished to identify the satisfaction level of their customers for the purpose of increasing the competitiveness of the enterprise. Nowadays, to ensure the development and competitiveness of an organisation, it is important to find new ways of work organisation and arrangement, enhance business processes and introduce innovations, which contribute to the productivity, quality and efficiency of labour.

The following hypothesis is put forward: customer ratings of their satisfaction give an enterprise an opportunity to enhance its business.

The research aim is to identify opportunities for enhancing the quality of restaurant services for BBS-Dizain Ltd based on customer satisfaction ratings.

To achieve the aim, the following specific research tasks are set: (1) to identify the satisfaction of customers with restaurant services provided by BBS-Dizain Ltd, (2) to perform an in-depth analysis of the lowest-rated component of the customer satisfaction tree identified while performing the first research task.

The research employed general, sociological and statistical analysis methods as well as marketing methods. The research used BBS-Dizain Ltd unpublished data for the period 1 January-31 August 2018 as well as primary data acquired by the authors while working on the present research.

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Research results and discussion

To identify the opinions of customers on the quality of services provided by the restaurant and the customer satisfaction index, the research, first of all, identified 15 components of the customer satisfaction tree (or the performance of the restaurant) for the analysed enterprise – BBS-Dizain Ltd.

Babris S. et al. (2016) point out that business efficiency requires active involvement of the management, employees and stakeholders in planning and introducing business enhancement activities and in performance tracking; therefore, the employees, industry experts and customers were involved in identifying the components.

Table 1

**Customer ratings of their satisfaction with the quality of services provided
by BBS-Dizain Ltd**

Consumer satisfaction tree components	Importance ratings		Ratings of quality, points					Average rating of quality	Customer satisfaction index
	average	weight, %	5	4	3	2	1		
Interior design	3.02	4.7	62	38	0	0	0	4.62	100
Room arrangement	3.44	5.4	96	4	0	0	0	4.96	100
Room tidiness	4.82	7.6	89	11	0	0	0	4.89	100
Arrangement of tables	4.01	6.3	8	84	8	0	0	4.00	92
Table decoration	4.73	7.4	1	12	66	21	0	2.93	13
Personnel professionalism	4.48	7.0	55	43	2	0	0	4.53	98
Personnel attitude	4.89	7.7	88	10	2	0	0	4.86	98
Available assortment of dishes	4.71	7.4	81	18	1	0	0	4.80	99
Quality of dishes	5.00	7.8	64	27	9	0	0	4.55	91
Size of a portion	4.11	6.4	82	15	3	0	0	4.79	97
Order completion time	4.90	7.7	11	31	54	4	0	3.49	42
Quality of drinks	4.12	6.5	88	9	3	0	0	4.85	97
Customer service methods	4.23	6.6	58	41	1	0	0	4.57	99
Payment system	2.87	4.5	93	7	0	0	0	4.93	100
Quality of customer service	4.46	7.0	42	52	6	0	0	4.36	94
Total	63.79	100	918	402	155	25	0	-	-
Quality rating weight, %	-	-	61	27	10	2	0	-	-
Accrued weight, %	-	-	61	88	98	100	100	-	-
Average rating	-	-	-	-	-	-	-	4.48	88

Source: authors' calculations based on Kane M.M. et al., 2009

One hundred randomly chosen customers of the enterprise were requested to rate the IMPORTANCE of customer satisfaction tree components on a five-point scale (5 – very important, 4 – important, 3 – moderately important, 2 – slightly important and 1 – unimportant) as well as the performance or QUALITY of the components on a five-point scale (5 – very good, 4 – good, 3 – acceptable, 2 – poor and 1 – very poor). The survey was conducted in the period 2-31 July 2018. The results are presented in Table 1.

As shown in Table 1, the most important components of performance of the restaurant were as follows: quality of dishes (5.00 points), order completion time (4.90), personnel attitude (4.89),

room tidiness (4.82) etc. Moderately important components were as follows: the payment system (2.87), interior design (3.02) and room arrangement (3.44). An analysis of the customers' ratings of the quality of customer satisfaction tree components revealed that table decoration (2.93) and order completion time (3.49) were rated the lowest by the customers. The other components were rated at 4 or higher. The average rating of the quality of restaurant services was high - 4.48 points.

The customer satisfaction index that was calculated based on all the customers who rated quality at 5 and 4 points (according to a methodology suggested by Kane M. M., Ivanov B. V., Koreskov V. N., Shirtladze A. G.) showed that overall, the customers were satisfied with the quality of the restaurant's services (customer satisfaction index=88) as well as with some performance components, particularly room interior design (index=100), room arrangement (100), room tidiness (100), the payment system (100) etc. The survey revealed that table decoration was rated very low (index=13 out of 100).

The survey questioned the restaurant's employees to establish their opinions about the customers' ratings of the quality of customer satisfaction tree components. The employees rated table decoration the lowest as well. The data acquired from both respondent groups were compared by employing contingency analysis to verify whether the ratings depended on respondent group. The hypotheses to be verified were as follows:

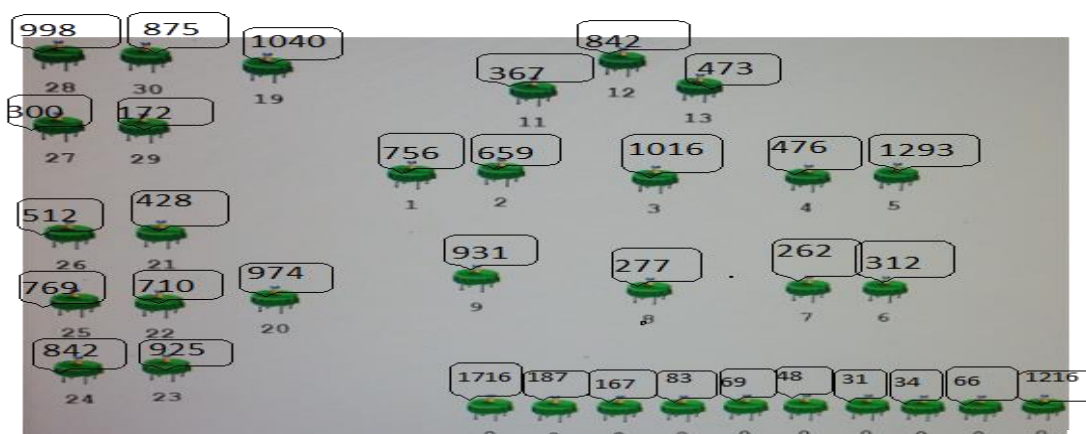
H_0 : No causal association between the ratings by the customers and the employees;

H_1 : there is a causal association between the ratings by the customers and the employees.

Since $\chi^2 = 12.23 > \chi^2_{0.05;3}$, H_0 has to be rejected and H_1 has to be accepted. This means that at a confidence level of 95 %, one can assume that there is an association between the ratings by the customers and the employees.

This implies that the respondents of both groups were unanimous regarding enhancement of table decoration.

To identify the baseline situation, the authors analysed the demand for tables by customers at the restaurant (Figure 1).



Source: authors' calculations based on BBS-Dizain Ltd data

Fig. 1. Number of customers served at tables at the restaurant of BBS-Dizain Ltd from 1 January to 31 August 2018

The data indicate that the most demanded tables were No. 5, 19 and 3. After analysing the locations of the tables, the surrounding environment and interior items and other aspects, the authors concluded that customers had an opportunity to „seclude themselves” at tables No. 5 and 9, as both tables were located in the corners of the room as well as the restaurant's window overlooked

the well-arranged outside, while table No. 3 was placed at a fireplace, which was preferred by customers being romantics.

The authors made a Top 10 for tables both in terms of generalised revenue and in terms of number of customers served.

Table 2

TOP 10 of restaurant tables in terms of generalised revenue and number of customers served by BBS-Dizain Ltd from 1 January to 31 August 2018

Ranking	Table No.	Revenue from the table, EUR	Table No.	Number of customers served at the table
1.	5	29394	5	1293
2.	3	21760	19	1040
3.	28	20707	3	1016
4.	19	20171	28	998
5.	20	20145	20	974
6.	23	19190	9	931
7.	30	18349	23	925
8.	12	18172	30	875
9.	24	17238	24;12	842
10.	25	15674	25	769

Source: authors' calculations based on BBS-Dizain Ltd data

In the Top 10, tables No. 5, 3, 28, 19 and 20 were the best performers both in terms of number of customers served and in terms of generalised revenue. The authors' calculations showed that five best-performing tables from the Top 10 accounted for more than half of total revenue from business and more than half of total customers served in the analysis period. This means that the potential of the other tables was not used sufficiently.

The authors carried out an experiment – two tables not included in the Top 10 were decorated to identify whether customers would choose them. Before the experiment, in the authors' opinion, the tables were not decorated in an attractive manner and did not create a feeling of being in a fancy restaurant, whereas during the experiment the tables were decorated to create a festive atmosphere. The authors used a chiffon tablecloth, as it was available and easy-to-clean, and it was easy to experiment in terms of decoration. The authors placed autumn tree leaves between tablecloth layers; apples for the decoration purpose were taken from an apple tree growing in the backyard of the restaurant. Only flowers and candles made some costs for the experiment.

Table 3

Number of customers wishing to reserve a decorated table during the experiment at the BBS-Dizain Ltd restaurant

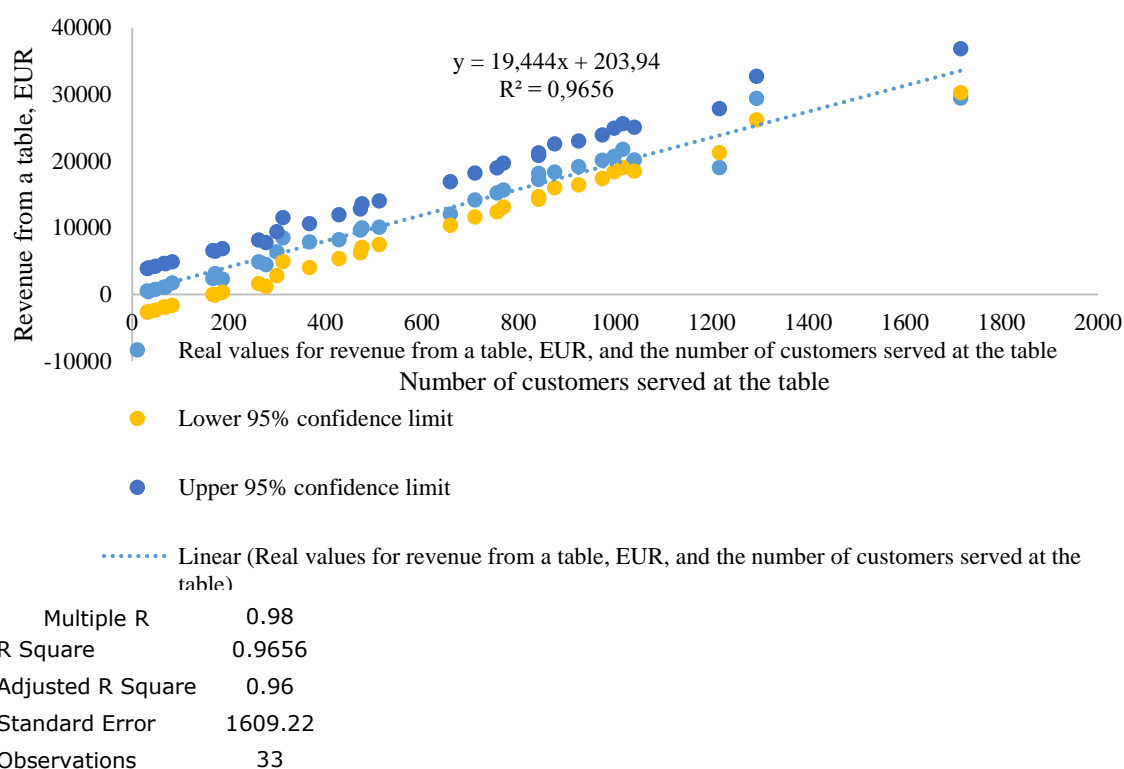
Date	Number of decorated tables	Number of customers wishing to reserve a decorated table
16.10.2018.	2	0
17.10.2018.	2	1
18.10.2018.	2	7
19.10.2018.	2	13
20.10.2018.	2	18
21.10.2018.	2	29
22.10.2018.	2	11

Source: authors' experiment

During the experiment, most of the customers chose particularly the decorated tables after getting to know No extra charge had to be paid for these tables. In some cases, customers asked whether they could reserve particularly the decorated tables before making their reservations.

The data acquired during the experiment indicated that the customers preferred the decorated tables. This allows concluding that such a table enhancement is necessary for all the tables. The authors suggest applying a differentiation strategy to table decoration, i.e. currently the most demanded tables should be decorated in a classical manner, while the least demanded ones – in a fancy manner in order to arouse a wish in customers to choose them.

Such a table enhancement might increase the number of customers served and revenue for the enterprise.



Source: authors' calculations based on BBS-Dizain Ltd data

Fig. 2. **Scatterplot for an association between BBS-Dizain Ltd revenue from a table (EUR) and the number of customers served at the table (01.01.-31.08.2018), the regression line, the equation and the range of values**

To identify a causal association for the dependent variable (revenue generated from a table) if the independent variable (number of customers served at the table) changes by one unit, the authors did a single-factor regression analysis. The results are presented in Figure 2.

The correlation coefficient showed that if the number of customers served at the table changes by one standard deviation of the mean, one can expect that revenue might increase by 0.983 standard deviations. The determination coefficient equalled 0.9656, which indicated that the factor of the equation explained 96.56 % of the dispersion of the dependent variable.

Based on the equation acquired:

$$y = 19.444x + 203.94 \quad (1)$$

Where:

y – total revenue from a table (EUR);

x – number of customers served at the table,

the authors conclude that an increase in the number of customers served at a table by one, **revenue from the table rose by EUR 19.44.**

The confidence interval at a 95 % confidence level for the regression line slope coefficient for the sample was in the range of $18.10 \leq \beta \leq 20.79$. This means that at a 95 % confidence level or 0.05 significance level, one can expect the regression coefficient is not smaller than 18.10 and not larger than 20.79. It follows that an increase in the number of customers served at a table by one person results in an increase in revenue by not less than EUR 18.10 and not more than EUR 20.79. A test of the statistical significance of the regression coefficient showed that at a 95 % confidence level, the dependent variable (revenue) depended on the independent variable (number of customers served at a table). The test of the regression equation hypotheses revealed that one can assume at a 95 % confidence level that the linear equation explained variable changes statistically significantly.

Conclusions, proposals, recommendations

- 1) For the customers of BBS-Dizain Ltd, the most important restaurant performance components were as follows: quality of dishes, order completion time, personnel attitude and room tidiness, while moderately important components were as follows: the payment system (2.87), interior design (3.02) and room arrangement (3.44). Table decoration (2.93) and order completion time (3.49) were rated the lowest by the BBS-Dizain Ltd customers. The average rating of the quality of restaurant services was high – 4.48 points.
- 2) The BBS-Dizain Ltd customers were satisfied with the overall quality of restaurant services (customer satisfaction index=88) as well as some performance components, particularly room interior design, room arrangement, room tidiness and the payment system.
- 3) Both the customers and the employees of BBS-Dizain Ltd were unanimous regarding enhancement of table decoration. The customer satisfaction index for table decoration was very low (index=13).
- 4) The authors recommend the management of BBS-Dizain Ltd to apply a differentiation strategy to table decoration: currently the most demanded tables should be decorated in a classical manner, while the least demanded ones – in a fancy manner in order to arouse a wish in customers to choose them.
- 5) The authors recommend the management of BBS-Dizain Ltd to perform two assessments of the quality of services provided and consumer satisfaction by using the consumer satisfaction tree components identified by the present research in order to contribute to continuous enhancement of performance and competitiveness of the enterprise.

Bibliography

1. Babris, S., Kalkis, H., Murnieks, J., Piekuss, U. (2016). LEAN risinājumi efektīvākam biznesam (LEAN Solutions for Efficient Business). Monograph. Riga, 187 p.
2. BBS-Dizain Ltd. data.
3. Kane M.M., Ivanov B.V., Koreskov V.N., Shirladze A.G. Sistemi, metodi i instrumenti menedzmenta kacestva. (Systems, Methods and Instruments for Quality Management. Textbook for universities). Saint Petersburg, 2009. 560 p.
4. Linina, I. (2018). Ka piesaistit un noturet pirceju (How to Attract and Retain a Customer). Monograph. Riga: Turiba University. 6. p.

INTERNAL COMMUNICATION AND ITS IMPACT ON MANAGEMENT ON THE EXAMPLE OF THE TERRITORIAL GOVERNMENT UNIT

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Abstract. The article presents the importance of communication processes in territorial government units to increase the quality of management with both knowledge and information. The theoretical part presents the essence of internal communication and the principles of new public management. In the empirical part, an analysis of the results of surveys conducted among officials working in the District Office in Busko-Zdroj, Swietokrzyskie Voivodship (south-eastern Poland) was carried out. The article uses a descriptive method, the data are presented in a tabular format. According to the analyses carried out, the biggest problem indicated by respondents was the lack of operational efficiency of information as well as poor use of modern instruments such as intranet, business mobile phones or videoconferencing. The conducted research indicated the need to create integrated networks in order to improve flow of information processes as well as to introduce a new form of learning (exchange of knowledge and information) in teams.

Key words: internal communication, territorial government, new public management.

JEL code: M1, H8.

Introduction

Communication in every organization is indicated as a key factor for organization development (Kantane I., Sloka B., Vilcina A., Ozolina I., 2012). Communication processes are one of the determinants of the quality of the organization's management, they determine the effectiveness and efficiency of management to a large extent (Kielbasa B., Kalinowski S., 2018). Communication in each organization affects directly the implementation of basic management functions, i.e. planning, organizing, motivating and controlling.

The influence of communication processes on the management of territorial government units is similar, despite the fact that they implement other goals, including non-financial, public, social ones (Prus P., Drzazdzynska K., 2017). Rules for the functioning of territorial government units are determined by the European Charter of Local Self-government. It states that „*local self-government is the right and ability of the local community to manage and control a fundamental part of public affairs on their own responsibility and in the interests of their residents*” (European Charter of Local Self-Government, 2013). Thus, the territorial self-government is a public entity which covers all inhabitants of a given area (Act of 5 June 1998 on district self-government, Journal of Laws of 2018, item 995).

The aim of the study is to analyse the importance of internal communication processes for the quality of knowledge and information management on the example of a local government unit as well as identification of barriers for internal communication processes and the possibility of their elimination. The research is qualitative and refers to the case study of a selected unit. The subject matter is the office and headquarters of the Starost⁴ and administrative authorities of the district. The study covered officials working in the Starost District Office in Busko-Zdroj, Swietokrzyskie Voivodship (south-eastern part of Poland). A survey method with a questionnaire of standardized questions was used to obtain primary data. The questionnaire contained 10 questions (including cafeteria and open questions). The article discusses the problem of the quality of internal

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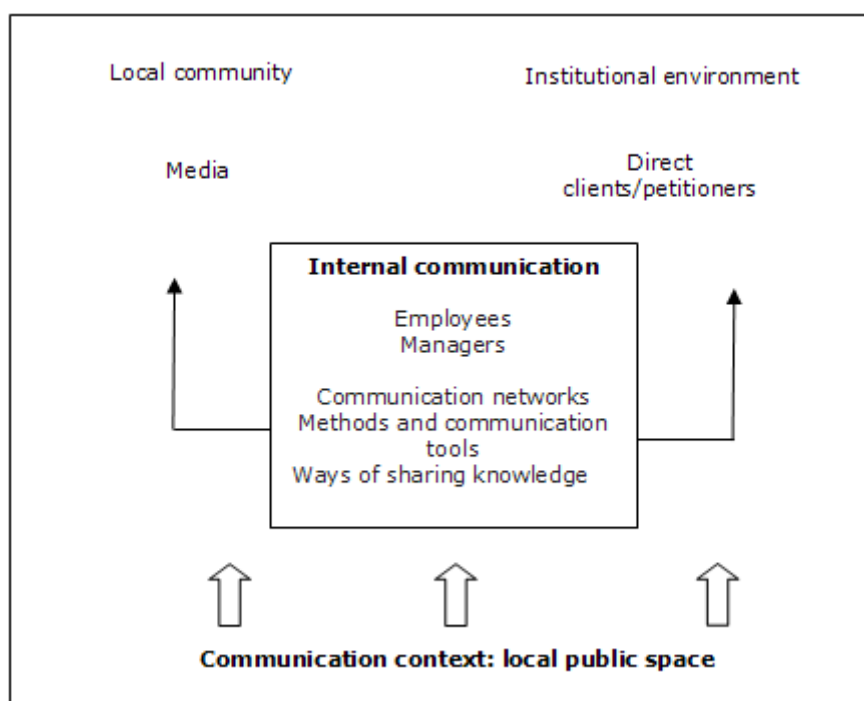
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⁴ Starost District Office is an auxiliary unit appointed for the purpose of executing orders of the district management, president of the management and resolutions of the district council. *Encyclopedia of management*, Retrieved: https://mfiles.pl/pl/index.php/Starostwo_powiatowe, Access: 10.01.2019

communication which significantly affects the effectiveness of communication with the external environment.

The essence and importance of internal communication in public units

Internal communication in organizational units is one of the most important element of human resources management. Both public and non-public units must equally care for the quality of communication. In public units these processes run in a similar way as in other organizations but their nature and purpose are slightly different. In the paper of Z. Kruzmetra, B. Bite and G. Kronberga (2018), they emphasize „the responsibility of local governments to build communication with people, to develop safe and sustainable communities, to provide services, build trust and reduce social distances”. It should be remembered that communication with the environment in self-government units is public. It is formal, takes place in a specific communication space and is aimed at transferring and exchanging information of public use and maintaining social ties (Smalec A., 2015; Marcysiak T., Prus P., 2017). This type of communication is limited to the public and formal sphere, i.e. to a territory regulated by law. Thus, the communication context, that is the conditions of the local public space in which communication processes occur, should be taken into account in communication processes with the environment (Figure 1).



Source: authors' construction

Fig. 1. Main elements of a communication process on the example of a territorial government unit

External communication is the relationship of the organization with the environment, in this case with the inhabitants of the commune, representatives of the authorities of other units, local media, etc. (Figure 1). The most important thing in every local government unit is communication with citizens. Characterizing the processes of communication with the environment (external communication) it should be noted that it is primarily informative. The flow of information to the public communication system is usually planned, routine and complies with the procedures established by law. Public communication deals primarily with the management of public data and the regulation of relations between public services and its users (Poznanska A., 2012). It also includes

providing the media with information, organizing press conferences, giving interviews, providing promotional and informational materials, international cooperation, conducting electronic correspondence, writing reports and materials. Generally, these are all activities that aim to represent the organization outside and provide the environment with information (Figure 1).

Internal communication is of particular interest in this article. It affects the quality of relationships with the environment and can improve it. In the absence of effective communication within the organization external communication will also be difficult. Internal communication refers to the relationship between employees of the unit, managers and management. It takes place in various networks and working teams (command or task) (Ober J., 2007). It is important to create appropriate teams and communication networks that influence the activity and motivation of employees and also allow them to identify themselves with the organization. This contributes, to a large extent, to achieving the assumed goals, creating an organizational culture, and also promotes organizational learning (Killigsworth C., 2009).

Internal communication is operational, hence the „operativeness“ of communication (information, knowledge, messages) in the process of performing current tasks is important (Mistre Z., Zvaigzne A., 2012). In achieving operational goals it is necessary to achieve effective (Drucker P., 2006):

- informative communication (involving the transfer of data, information and knowledge), and
- persuasive communication (allows to motivate and encourage employees to carry out assigned tasks).

Communication barriers inside the organization make it difficult to design effective strategic messages that are extremely important in managing local development (Nielsen J. A., Salomonsen Houlberg H., 2012). Therefore, it is possible to put forward the thesis that the more effective internal communication is, the more effective the processes of communication with the environment will be.

New Public Management (NPM) as an indicator of internal communication in public units

Internal communication area in organizations faces ever newer challenges. Developing digitization processes are the basis for changes taking place in a very important process of internal communication, which must keep up with modern trends and the needs of its recipients. The analysis of the results of research conducted in 2016 by GFMP Management Consultants „The future of internal communication“ (Internal Communication, GFMP Report, 2016) showed that as many as 62 % of the surveyed communication staff say that it is much easier to get with information to employees today. In contrast, they saw the communication barrier on the side of management and the attitudes of employees themselves.

The idea of new public management is to replace the bureaucratic model of administrative management with a managerial model. It comes down to applying in the public sector principles and management models used in the private sector. According to J. Supernat (2004), this model points out: introducing market mechanisms, focusing on the client, creating appropriate conditions encouraging employees to take initiatives, drawing attention to innovation and enterprise. Internal communication is one of the important elements.

In the aforementioned report, where 11 sectors were surveyed, including administration, offices and NGO - 61 % of these organizations had a formally developed internal communication strategy and more than half of them checked communication efficiency, of which 30 % on a regular basis and

46 % irregularly (Internal Communication, GFMP Report, 2016). This very important issue requires constant evaluation and raising of standards. Communication at the highest level means not only an efficient circulation of information, improving the quality of services but also a quick reaction in crisis situations and creating a positive image of a public entity (Cutlip S. M., Center A. H., Broom G. M., 2006).

The values of New Public Management are so-called Three „E”: Effectiveness, Efficiency and Economy (Shaping the Communication Process ..., 2014). The implementation of these values by public units is no longer a fashion but a necessity in the 21st century. Conducting organizational transformations, creating new procedures or motivation systems is necessary for increasing the competitiveness of offices and satisfying the needs of stakeholders.

Internal communication is a basic element of creating an organizational culture. It is a kind of dialogue between all levels of structures in the organization. Efficient internal communication as well as loyal and well-informed employees are the strength of every unit, becoming more flexible and willing to react quickly in any situation, especially crisis situations. The saying „*public relations starts at home ... (means inside)*” especially emphasizes the role of internal communication and creating positive internal relations that have a direct impact on external communication processes (Maruszak P., 2014). In the case of offices these relations are the essence of creating a positive image in the group of stakeholders.

As the results of surveys conducted in 2017 by Empla company supporting communication in organizations show, there are still many problems in the communication processes with which employees have to struggle on a daily basis. It turns out that as many as every fourth employee of medium and large enterprises in Poland has a sense of being uninformed about the activities carried out by their employer and 71 % think that the organization will not succeed in business without partner and open communication with employees. According to employees, department managers should be primarily responsible for an efficient flow of information (67 % of responses) (Business Efficiency ..., 2017).

Research results and discussion

In total, 106 employees were employed in the analysed Starost District Office. As a result of the research carried out in 2018, there were answers from 63 officials from various levels of the organizational structure (trainees, specialists, department heads). The sample included 44 women and 19 men aged 20-64. People aged 36-50 (44 %) dominated in the sample. More experienced people: aged 51-60 were quite a large group (25 %). The sample also included people with lower professional experience: aged 20-35 (24 %). The analysed institution also employed people in pre-retirement age (61-64 years) - in the sample they were 4 people. Based on the analysis of the demographic structure of employed officials it can be noted that the surveyed organization is characterized by a relatively young staff with extensive professional experience and an advantage of female employees.

Table 1 presents the aggregated answers of respondents to the use of different communication networks to carry out assigned tasks or solve problems. Respondents indicated the networks most frequently used in the organization and then assessed their effectiveness in solving problems or achieving goals - on a scale of 1 to 5, where 5 meant the best and 1 the lowest grade.

Table 1

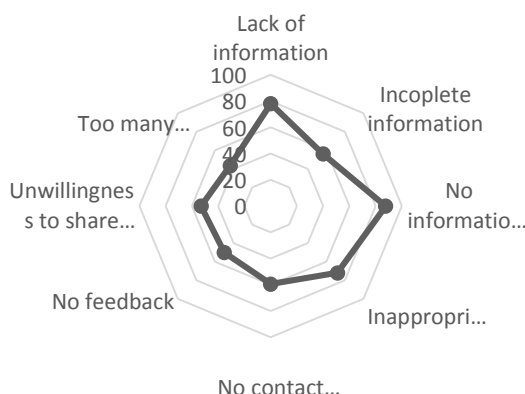
**Application and assessment of the effectiveness of popular types
 of communication networks in the institution under study, in the opinion
 of respondents**

No	The type of communication networks	Application (rating from 5 to 1, where 5 is the most used type and 1 is the least frequently used)	Effectiveness (rating from 5 to 1, where 5 is the most effective type and 1 is ineffective)
1.	Chain type network	2.5	4.0
2.	Circular network	3.0	3.0
3.	Star type network	3.0	3.0
4	Integrated network	1.5	4.0

Source: authors' research

The most frequently used network was the circular and „star“ type one, due to the fact that employees operate within departments on a daily basis - working in command teams and cooperating in strictly defined teams (i.e. a specific department). In such a network each post has the same position in relation to the others and there is a possibility of direct communication with employees in a given department. At the head of each department there is a manager - a person occupying a central position in relation to all the others (a „star“ type network). Thanks to this, there is a possibility of fast, direct and two-way communication and monitoring of its course. A „chain“ type network is also used quite often in the surveyed Starost Office (Table 1). It is used to carry out every day, routine tasks as well as those that are divided into smaller elements. As for assessing the effectiveness of communication networks to solve problems and achieve the organization goals - the most-rated was integrated network (peer-to-peer). It allows employees to communicate freely and there is No person in a dominant position (manager, director). This type of cooperation was not frequently used in the organization under study (Table 1). Integrated networks are created to perform difficult and complex tasks that require an interdisciplinary approach (e.g. project management). A valuable example of such projects can be investments implemented from funds obtained from EU which require consistent cooperation and exchange of information between employees of various cells and organizational levels (Satola L., 2014). Apart from the integrated network, the employees rated the „chain“ type of network very highly due to the implementation of procedural and routine tasks resulting from the specificity of work in a public unit of this type.

The analysis of the results of the survey clearly indicated the diversification of the assessment of internal communication processes in the surveyed organization. These processes were positively rated by 31 respondents and negatively by 32. This may indicate a lack of coherence in the management of internal communication processes and points the existence of conscious communication barriers. The respondents indicated the most important barriers that in their opinion generate problems in the processes of internal communication, also implicating - to a large extent - the quality of communication with the environment. Figure 2 presents the barriers indicated by 32 employees of the analysed institution who made a negative assessment of internal communication processes. Respondents could point to several communication barriers occurring in the organization under study.



Source: authors' research

Fig. 2. Barriers to internal communication, in the opinion of the respondents (n=32)

Identified barriers can be divided into organizational and individual ones. Some of them penetrate each other, affecting each other which is why they are difficult to separate. The biggest problem indicated by the respondents was the lack of information operability i.e. the lack of information when it is necessary for the implementation of the assigned tasks. It often arrives too late. This problem was indicated by $\frac{3}{4}$ of respondents (Figure 2). A significant group of almost 80 % of respondents pointed to a very serious problem of the lack of information. The reason for this is the cost of acquiring knowledge and information, often too high for a small public unit. The reason may also be the lack of awareness of sources of knowledge and information (employees or managers do not know where to look for information). An important problem according to the respondents was also the inadequate form of the message, e.g. an illegible, incomprehensible message, incompatible with the software used etc. According to some respondents, the lack of contact with the immediate supervisor generates significant communication problems. According to them, the lack of meetings or conversations with the manager or the management block two-way communication and makes the information that reaches employees not „first hand” information. It also involves the lack of feedback and incentives to share knowledge and information in employee teams. Respondents also stressed the need to reduce the level of formalization of communication processes (including those in writing) and to enable and encourage informal contacts - in interpersonal-direct form (direct conversation). This type of communication contributes to building an organizational culture and is an effective way to exchange knowledge and information between employees.

Internal communication in the organization uses various tools and instruments. These tools work in different ways, have their advantages and disadvantages. The variety of instruments allows employees to adapt better to the situation and provides them with an ability to prepare effective messages and choose an appropriate communication channel. In the surveyed public unit, almost 33 % of employees participating in the study recognized direct contacts (interpersonal-direct communication) as the basic way of communication with colleagues. In the second place, telephone calls were indicated (26 %) as a form of interpersonal communication using the medium (telephone device). For almost 24 % of respondents, meetings and conferences (group communication) are important. The Internet has become the main tool for communication and collecting of information in many organizations (Werenowska A., 2014), the respondents also saw this instrument. They indicated e-mail as an effective way of transferring and receiving information (17 %).

When analysing the information obtained from the employees of the public unit under study regarding the need to implement new internal communication tools, a few were pointed out:

- Internal internet forum (Intranet) - 38.1 % of responses;
- Business mobile telephones - 31.1 %;
- Videoconferencing - 25.4 %;
- Electronic information boards - 5.4 %.

The medium that allows the fastest information transfer is undoubtedly the Internet and this particular means of communication has clearly inspired changes in the style of media use in recent years. Information has become the main attribute of information society and it has developed as a result of the use of new information and communication technologies (ICT) (Jaska E., Werenowska A., 2018). It is worth using this potential in improving internal communication of the analysed unit.

Conclusions

- 1) A new approach to the management of public entities indicates the de-bureaucracy of the internal communication system in this type of units and the introduction of a managerial model. This need was also noted by the employees of the surveyed organization who evaluated the communication system and pointed to the needs in this area. They highly appreciated the importance of direct communication in the performance of their duties. Despite the large acceptance of this form of communication, they drew attention to the need for intensive use of modern instruments such as intranet, business mobile telephones or videoconferences. Their combination with traditional instruments and the creation of a two-way communication system can be the basis for improving the communication system in public units.
- 2) For the efficiency of communication systems in an organization, the knowledge about barriers to these processes and ways to eliminate them is necessary. The conducted research allowed to distinguish organizational barriers as well as those of an individual character. The biggest problem indicated by the respondents was the lack of information operability i.e. the lack of information when it is necessary to carry out the assigned tasks. There is an informational gap. In order to prevent this, new tools should be introduced to obtain information when it is needed to carry out task or additional resources should be obtained, thanks to which it will be possible to purchase knowledge and information in a timely manner.
- 3) In the surveyed unit the need to create integrated networks in order to improve the exchange of knowledge and information and learning in teams was also indicated. The implementation of routine tasks does not allow the full use of the employees' capabilities and does not ensure effective information exchange within the organization. The creation of integrated networks and the implementation of tasks in the form of a project can change the social perception of local government units, thanks to the increased effectiveness of internal communication.

Bibliography

1. Cutlip, S.M., Center, A.H, Broom, G.M. (2006) *Effective Public Relations*. 9th ed. Upper Saddle River. NJ: Prentice-Hall. pp. 212-218.
2. Drucker, P. (2006) *The Practice of Management*. HarperBusiness. pp. 218-234.
3. *Efektywnosc biznesowa zaczyna się od komunikacji wewnętrznej (Business Efficiency Begins With Internal Communication)*, Badanie Emplo (Emplo Research), 2017, Retrieved: <https://emplo.com/e-book/przewodnik-o-komunikacji-dla-managera-pl/#lp-code-347>, Access: 7.01.2019.
4. *Encyklopedia Zarządzania (Encyclopedia of Management)*, Retrieved: https://mfiles.pl/pl/index.php/Starostwo_powiatowe, Access: 10.01.2019.

5. *Europejska Karta Samorządu Terytorialnego (European Charter of Local Self-Government)*, Dz.U. 1994, Nr 124 poz. 607, Retrived: <https://rm.coe.int/16807198a3>, Access: 12.01.2019.
6. Jaska, E., Werenowska, A. (2018) *The Availability and Use of Media Information Sources in Rural Areas*. Proceedings of the 2018 International Scientific Conference „Economic Science For Rural Development”. No 47. Jelgava, LLU ESAF. pp.115.
7. Kantane, I., Sloka, B., Vilcina, A., Ozolina, I. (2012) *Role of Communication for Development of Small and Medium Size Enterprises in the Regions of Latvia*, Proceedings of the 2018 International Scientific Conference „Economic Science for Rural Development”. Jelgava, LLU ESAF. p. 113.
8. Kielbasa, B., Kalinowski, S. (2018) *Knowledge and Information in the Processes of Managing the Organization. Case Study*. Conference Proceedings „Towards Productive, Sustainable and Resilient Global Agriculture and Food Systems”, Ed. E. Horská, Z. Kapsdorferová, M. Marcela Hallová, Published by Wolters Kluwer ČR, a. s., pp. 815-829, DOI: 10.15414/isd2018.s3.08.
9. Killingsworth, C. (2009) Municipal Government Communications: The Case of Local Government Communications. *The McMaster Journal of Communication*. Vol. 6. Iss. 1. Article 5. pp. 59-79.
10. *Komunikacja wewnątrzna (Intenal Communication)*, Raport GFMP 2016, Retrieved: <https://gfmp.com.pl/wp-content/uploads/GFMP-Komunikacja-wewnetrzna-Raport-2016.pdf>, pp. 1-6, Access: 11.12.2018.
11. Kruzmetra, Z., Bite, B., Kronberga, G. (2018) *Government-Citizen Communication in Rural Municipalities In Latvia*. Proceedings of the 2018 International Scientific Conference „Economic Science for Rural Development”. No 48. Jelgava, LLU ESAF. pp. 154-163.
12. *Kształtowanie procesu komunikacji wewnętrznej w urzędzie (Shaping The Internal Communication Process in The Office)*, Retrived: http://www.przyrow.pl/app/webroot/img/tiny_uploads/file/caf/Podr %C4 %99cznik.pdf, Access: 17.01.2019.
13. Marcysiak, T., Prus, P. (2017). *Life strategies of rural inhabitants of unfixed economic function*. Proceedings of the 26th International Scientific Conference Agrarian Perspectives XXVI „Competitiveness of European Agriculture and Food Sectors”, Czech University of Life Sciences Prague, Faculty of Economics and Management. pp. 212-218.
14. Maruszak, P. (2014) Public relations zaczyna sie w domu – istota komunikacji wewnętrznej (Public Relations Starts at Home - the Essence of Internal Communication). *Toruńskie Studia Bibliologiczne (Toruń Bibliological Studies)*. No 1 (12). pp. 99-111. DOI: 10.12775/TSB.2014.007.
15. Mistre, Z., Zvaigzne, A. (2012) *Assessment of Development Scenarios for The Regional Internal Communication and Information System of the Latvian Blood Donors Service*. Proceedings of the 2012 International Conference Economic Science for Rural Development. No 28. Jelgava, LLU ESAF. pp. 91-98.
16. Nielsen, J.A., Salomonsen Houlberg, H. (2012) Why All This Communication? Explaining Strategic Communication in Danish Local Governments from an Institutional Perspective. *Scandinavian Journal of Public Administration*. No 16(1). pp. 69-89. ISSN 1402-8700, e-ISSN 2001-3310.
17. *Ustawa z dnia 5 czerwca 1998 r. o samorządzie powiatowym*, Dz.U. z 2018 r., poz. 995 (the Act of June 5, 1998 about the poviats self-government, Dz.U. z 2018 r., poz. 995).
18. Ober, J. (2007) *Informacja i komunikacja w zarządzaniu (Information and Communication in Management)*. Politechnika Śląska. pp. 34-57.
19. Poznanska, A. (2012) *Komunikacja medialna a sfera publiczna: szanse i zagrożenia (Media Communication and the Public Sphere: Opportunities and Threats)*. Karkonoska Państwowa Szkoła Wyższa. Jelenia Góra. pp. 116-121.
20. Prus, P., Drzadzynska, K. (2017) *Farmers’ assessment of training services and the impact of agricultural advisory on selected developmental factors affecting farming*. Proceedings of the 2017 International Conference „Economic Science For Rural Development”. No 44. Jelgava, LLU ESAF. pp. 338-344.
21. Satola, L. (2014) Instytucje społeczeństwa obywatelskiego na obszarach wiejskich a sprawność wykorzystania funduszy Unii Europejskiej (na przykładzie województwa małopolskiego) (Civil Society Institutions in Rural Areas and Their Efficiency in Absorbing the European Union Funds (on the Example of the Małopolska Province). *Samorząd Terytorialny (Local self-government)*. No 5. pp. 24-35.
22. Smalec, A. (2015) *Local Government Offices Communication with Respect To Residents Of New Concept Of Management*. Proceedings of the MarkeLearn and TIIM Joint International Conference: Managing Intellectual Capital and Innovation for Sustainable and Inclusive Society. pp. 1335-1341.
23. Supernat, J. (2004) *Administracja publiczna w świetle koncepcji New Public Management (Public Administration in the Light of the New Public Management Concept)*. In: „Jednostka, państwo, administracja – nowy wymiar” (Unit, State, Administration – a New Dimension). (Ed.) E. Ura. Międzynarodowa Konferencja Naukowa Olszanica. Rzeszów. pp. 469-470.
24. Werenowska, A. (2014) *Possibility of applying modern forms of communication of agritourism farms with environment groups*. „Economic Science for Rural Development”. No 35. Jelgava, LLU ESAF. pp. 80.

HOW TO IMPROVE THE SITUATION IN A „DIFFICULT” LABOUR MARKET: AN EXAMPLE OF THE FORMER STATE-OWNED AGRICULTURAL FARM COMMUNES IN BRANIEWO DISTRICT OF POLAND

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Abstract Contemporary scientific concepts coincide with the claim that one of the major factors determining the development of countries and regions is the development of local units. Most definitions of socio-economic development emphasise the significance of human capital in developing this phenomenon. Braniewo District, with an rate of unemployment at a level of 22.2 %, is ranked first in Warminsko-Mazurskie Voivodeship, and is among the highest in Poland. A significant percentage of the unemployed (including the long-term unemployed) live in rural areas in former state-owned farm localities. Unemployment in rural areas is a separate socio-economic problem that requires specific remedies and actions, especially with regard to the activation of former state-owned farm areas. This study analysed selected factors shaping the local labour market in Braniewo District. To achieve the main aim, the identification of the economic and labour market potential of the population inhabiting selected communes of Braniewo District was required. This enabled the formulation of initial recommendations regarding the ways of stimulating the human capital in the „difficult” labour market. The research methods applied in the study include a deductive study of relevant literature, reports, statistical analyses and a qualitative study involving direct interviews with the authorities of the communes of the analysed area as well as a survey conducted among 224 inhabitants of flats from the resources of former state-owned agricultural farm real estate. The established diagnosis and conducted analysis of social consequences of the ownership changes introduced in the agricultural sector by the Agricultural Property Agency in Braniewo District enabled an assessment of the changes occurring in former state-owned farm localities, and their effects on the inhabitants of the analysed communes.

Key words labour market, former state-owned farm areas, systemic transformation, unemployment.

JEL code: J01; J88.

Introduction

The systemic transformation in Poland, initiated in 1989, resulted *inter alia* in the liquidation of state-owned agricultural farms (Panstwowe Gospodarstwo Rolne, PGR) (The Act, 1991). The aim of restructuring and distributing the assets of the Treasury (including PGRs) was to improve the effectiveness of farming and to make better use of the State assets (Wedrowska, Zapotoczna, 2004). It was assumed that the task was simple and effective. Unfortunately, economic and social consequences appeared to be very serious, as they resulted *inter alia* from the inadequate solution of the human problem. The scale of the problem is evidenced by figures. In Poland, almost 32 % of privatised, previously state-owned enterprises, were PGRs. Almost 3.8 million ha of land, which accounted for over 45.3 % of the rural area of the country, were subject to restructuring and privatisation. The area was inhabited by 38.3 % of the rural population in Poland. The transformation of the State agricultural sector directly affected approx. 460 thousand of PGR employees whose number, along with their families, amounted to almost 2 million people. In 1991, former state-owned agricultural farm families inhabited 6,000 residential communities (Rynki pracy..., 2008). Consequently, the process of liquidation, restructuring and ownership changes in the PGR resources contributed to the emergence of the phenomenon of mass structural unemployment excluding a large proportion of inhabitants of former state-owner agricultural farm communes from the labour market. The consequence of occupational exclusion was the progressive marginalisation of these

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communities, which also resulted in social exclusion of not only the former PGR employees but also of subsequent generations of their families (Marks-Bielska, 2005; Gajowiak, 2013; Michalewska-Pawlak, 2010; Tarkowska, 2000; Hartvigsen, 2014; Kisiel, Marks-Bielska, 2017).

The economic, social and spatial consequences of the transformation of the State agricultural sector are most noticeable in rural areas in the so-called „former state-owned farm” voivodeships, e.g. Warminsko-Mazurskie Voivodeship. There is No doubt that they particularly concern these districts and communes in which PGRs used to be located. In terms of the number of the unemployed, Braniewo District is the highest in Warminsko-Mazurskie and one of the highest in Poland. The aim of this study is to analyse selected factors shaping the labour market. Former state-owned farm communes of Braniewo District were used as an example. In order to achieve this aim, it was necessary to identify the economic and labour market potential of the population inhabiting the analysed area. This enabled the formulation of initial recommendations as regards the ways of stimulating the human capital, and thus of an answer to the research question being the title of this paper: how to improve the situation in a „difficult” labour market in former state-owned agricultural farm communes of Braniewo District.

The reason for undertaking the study was the need to diagnose and analyse social and economic consequences of the ownership changes introduced in the agricultural sector by the Agricultural Property Agency in Braniewo District. The study encompassed all communes located within the administrative boundaries of the district (i.e. Braniewo, Frombork, Lelkowo, Pieniezno, Płoskinia, and Wilczeta) with a particular focus on rural areas. Given the diversity and availability of sources, the study used data from the years:

- 2004-2017 – as regards the unemployment rate evolution;
- 1974-2018 – as regards the study of relevant literature;
- 2018 (July-November) – as regards surveys, direct interviews, field inspections, and the discussion panel.

Both quantitative data retrieved from the public statistics system (Statistics Poland’s Local Data Bank) and data aggregated by the District Employment Office in Braniewo and the offices of the following communes: Braniewo, Frombork, Lelkowo, Pieniezno, Płoskinia and Wilczeta were used in the study. Moreover, information collected from surveys (400 questionnaires were distributed with the return rate of 56 %), direct interviews, and field inspections was used. In each of the analysed communes, a discussion panel was organised in which local government representatives, Commune Office employees, and inhabitants of the analysed units participated. The article forms the first part of scientific considerations due to the limited volume.

Research results and discussion

Warminsko-Mazurskie Voivodeship is the fourth largest region in Poland with an area of over 24,000 km² and a population of 1,442,242, of which women account for 51.0 % and men for 49.0 %¹. Since the beginning of the systemic transformation in Poland, one of the region’s fundamental problems to be solved has been structural unemployment resulting from the liquidation of State-owned Agricultural Farms which, at the end of 1980s, covered almost 50 % of the total area of agricultural land in the Warmia and Mazury region (Niedzielski E., 2017). Of all the communes forming Warminsko-Mazurskie Voivodeship, Braniewo District was at the forefront of districts with over 50 % of agricultural land under the control of PGRs (Wojewodztwo Olsztyńskie..., 1974).

¹ As at 31.12.2017

Braniewo District, with a rate of unemployment of 22.2 % (as at 31.12.2017), is currently the highest in the Warminsko-Mazurskie Voivodeship, and is among the highest in Poland in terms of the number of the unemployed. The rate of unemployed in the corresponding period in Warminsko-Mazurskie Voivodeship amounted to 11.7 %, and in Poland it was 6.6 % (Table 1).

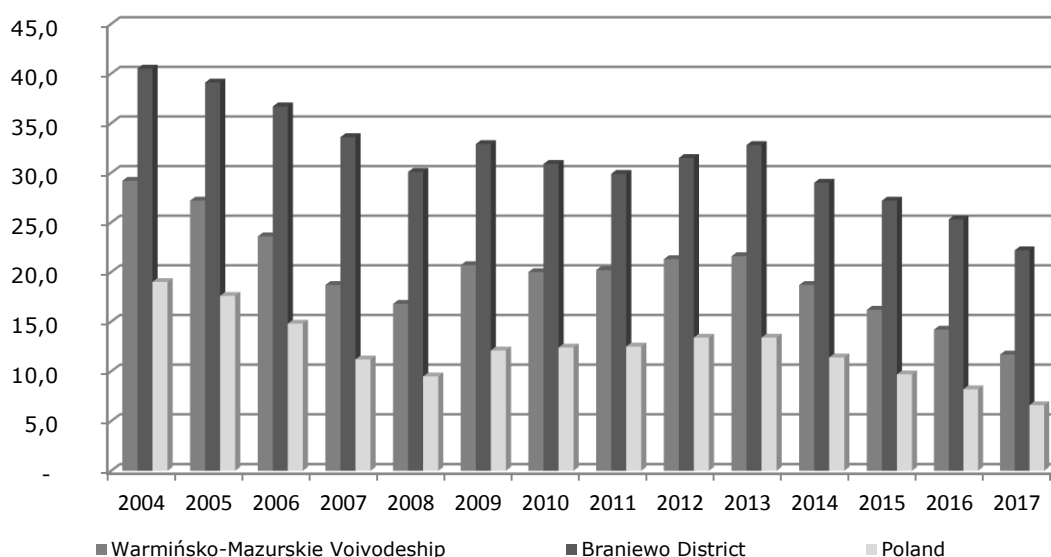
Table 1

**The unemployment rate in Warminsko-Mazurskie Voivodeship:
 December 2016, November 2017, and December 2017**

Territory?	December 2016	November 2017	December 2017	Increase/decrease 4-2
Poland	8.2	6.5	6.6	-1.6
Warminsko-Mazurskie Voivodeship	14.2	11.5	11.7	-2.5
Elblag Subregion	17.6	13.9	14.2	-3.4
Braniewo District	25.3	21.4	22.2	-3.1
Działdowo District	19.1	16.5	16.9	-2.2
Elblag District	20.8	17.9	18.0	-2.8
Iława District	6.0	4.7	4.9	-1.1
Nowe Miasto District	10.6	8.2	8.5	-2.1
Ostroda District	14.7	12.2	12.3	-2.4
The city of Elblag	11.3	9.1	9.0	-2.3

Source: author's calculations based on Statistics Poland's data for years 2017 and 2018.

The problem of high unemployment rate has been observed in the analysed district for many years. Fig. 1 presents the evolution of the unemployment rate in Braniewo District in the years 2004-2017 compared to the voivodeship and Poland.



Source: author's calculations based on Statistics Poland's data

Fig. 1. The rate of registered unemployment in Braniewo District in the years 2004-2017

According to the presented data, in 2004, after Poland's accession to the EU, with the average unemployment rate in Poland of 19.0 %, an index more than twice as high (40.5 %) was noted in Braniewo District, which was very unfavourable even compared to Warminsko-Mazurskie Voivodeship with the unemployment rate of 29.2 %. Since 2014, a gradual and progressive decrease in the

number of the unemployed has been observed both at the level of Braniewo District and of the entire voivodeship and Poland. An important role in this process is served by labour market institutions, including District Employment Offices, which, in accordance with the Act on the promotion of employment and labour market institutions, determine the so-called support profiles (I, II and III) based on the diagnosis of the situation in the voivodeship labour market. Depending on the unemployed person's classification into a specific profile, career counsellors prepare for them an individual plan of activation measures.

A significant percentage of the unemployed (including the long-term unemployed) live in rural areas. Unemployment in rural areas is a separate socio-economic problem that requires specific remedies and actions, especially with regard to the activation of former state-owned farm areas. The effects of unemployment should be considered under the conditions of local labour market typical of small towns such as Braniewo, Pieniezno, Frombork or specific former state-owned farm communities.

The problem of mass unemployment arose, as in the whole country, in 1991. Mass unemployment occurring after the liquidation of State Agricultural Farms (*Panstwowe Gospodarstwo Rolne*, PGR) was primarily due to the low level of human capital of these unemployed as well as maladjustment, in terms of qualifications and the mindset, to the emerging competitive labour market (Kopycinska, 2018). According to the District Employment Office's data, in Braniewo, at the end of 2017, almost a fourth of the total population were registered as unemployed. The surveys conducted among Commune Office employees and village leaders reveal that the district is poorly industrialised and lacks workplaces providing employment to a large number of people. In 2014, brewing production was relaunched at the Braniewo Brewery, which resulted in employment provided to almost 80 people. However, the labour market is too limited to offer employment to everyone willing and able to work, irrespective of their personal values, skills or education.

A great opportunity to improve the situation in the labour market was the introduction, in July 2012, of the Agreement on Local Border Traffic which, due to the convenient location of the town of Braniewo (two road crossing-points in Gronowo and Grzechotki), established potential conditions for economic development of the borderland between Poland and Russia (Zielinska-Szczepkowska, Zabielska, 2016). As shown by statistical data, local border traffic has contributed to an increase in tourism activity of Russians and Poles alike, which was often combined with purchases of goods and services in border localities. Throughout the nearly 4-year term of the Agreement on Local Border Traffic, almost 80 % of foreigners crossed the eastern border of Poland for commercial and tourism purposes (Statistics Poland, 2014). Numerous border crossings performed by inhabitants of the Kaliningrad Oblast of the Russian Federation to do shopping in borderland shopping centres and grocery discounts during periods of increased traffic (before important Russian celebrations) contributed to an increase in incomes earned by entrepreneurs. In Braniewo District, new large surface stores with signboards in Russian language emerged, and their working hours were extended (sometimes they were open 24 hours a day including on Sundays and holidays). For the inhabitants of Polish borderland areas (including Braniewo District), facing the problems of high unemployment rate, the Agreement on Local Border Traffic was a great opportunity to improve their financial situation. The entry into force of visa-free traffic and the development of shopping tourism enhanced economic activity and contributed to the development of small businesses. It should be stressed that for a number of Poles inhabiting the borderland between Poland and Russia, the so-called fuel tourism became a particularly popular form of activity due to large

differences in fuel prices (Zielinska-Szczepkowska, Zabielska, Kisiel, 2018). The turning point was the suspension of the Agreement on 4 July 2016 by the Polish side, with the Russian side retaliating in kind. Since then, border traffic between Poland and the Kaliningrad Oblast has been taking place exclusively on a visa basis, which, unfortunately, has had a very negative impact on the possibility for further development of entrepreneurship in the analysed district.

In today's reality, when assessing the economic situation of Braniewo District, it should be stated that it fails to make full use of the development opportunities arising from the borderland location. A certain number of inhabitants solve their financial problems by means of smuggling and illegal trade. However, such a way of earning a living is only a way of survival and not of ensuring a decent life.

Table 2 presents the number of the registered unemployed in particular communes of Braniewo District at the end of 2017.

Table 2

The registered unemployed by communes (as at 31 December 2017)

Commune	Number of people in total	of which:					
		women	in a particularly difficult situation in the labour market	under 30 years of age	including under 25 years of age	over 50 years of age	the long-term unemployed
The town of Braniewo	791	445	682	221	102	206	458
Braniewo commune	496	276	448	151	81	136	313
The town and commune of Frombork	214	124	192	60	27	53	139
The town and commune of Pieniezno	280	167	240	68	32	68	194
Lelkowo commune	479	254	444	121	64	140	345
Płoskinia commune	166	102	139	47	28	43	98
Wilczeta commune	249	130	226	74	35	69	174
Braniewo District	2675	1498	2371	742	369	715	1721

Source: author's calculations based on Statistics Poland's data for years 2017 and 2018.

When analysing the structure of the unemployed in Braniewo District, it should be stressed that the great majority of registered people are those in a particular difficult situation in the labour market (88.63 % of the total number of the unemployed). An important issue in labour market analysis is unemployment among young people under 30 years of age. At the end of 2017, the number of the registered unemployed aged under 30 years in the analysed district was 742, which accounted for as much as 27.74 % of the total number of the unemployed. Almost a half of the above-mentioned people are young people under 25 years of age, often school graduates with No experience required by the employers, which results in a high unemployment rate in this age group.

A separate group that has been faced with the problem of unemployment is that of the elderly, including people over 50 years of age. Given the statistical data, the greatest number of the unemployed in this age group and among the long-term unemployed was noted in Lelkowo commune. A significant problem in the Braniewo labour market is the high percentage of the 50+ unemployed with No professional qualifications; according to the data of the Voivodeship Employment Office in

Olsztyn, every third unemployed person (33.3 % of the total number of the registered ones) has No qualifications to practice any profession authenticated with a relevant diploma, certificate or other document.

During the survey conducted among the inhabitants of Braniewo District communes, they were asked *inter alia* to indicate the causes of unemployment within the district (Fig. 2).



Source: author's calculations based on survey results (N=226)

Fig. 2. What are the causes of unemployment in Braniewo District?

The great majority of respondents indicated the lack of suitable bus connections with other localities and towns (26 % of answers). The following answers were ranked second: the lack of appropriate education and limited opportunities to obtain professional qualifications, and too low employers' requirements (22 and 15 % indications, respectively). For 12 % of respondents, the high unemployment is due to the small number of job offers. Almost every tenth respondent believed that employers in the district had too high requirements, while the same number of women were of the opinion that an obstacle to taking up employment was the absence of low-cost care for children (nurseries, kindergartens) and the elderly (day care centres, retirement communities, etc.).

The consequences of long-term structural unemployment were also the topic of direct interviews with employees of communal social welfare centres granting social assistance benefits to the inhabitants of former State Agricultural Farms on a daily basis, as most people who lose their right to the unemployment benefit join the ranks of social assistance system beneficiaries. Officials report that the unemployed in a particularly difficult situation in labour market notice a deterioration in their mood, feel anxiety and distress, and suffer from depression. Unemployment has a devastating effect on their families, life plans of their members get disrupted and the safe existence of the family is at risk. Joblessness causes rapid degradation and exacerbates family's poverty. Unemployment is also a conflict-forming factor which exacerbates social ills such as alcohol abuse, excessive aggression and domestic violence. Parents' unemployment frequently implies, for children and young people, a change to and the limitation of plans for further education, lowering their professional aspirations, and the inhibition of the development of their skills and interests. Statistical data clearly show that unemployment increasingly affects young people, particularly those under 30 years of age. As regards the former state-owned agricultural farm localities, an additional factor contributing to the preservation of this unfavourable situation is a phenomenon known as the inheritance of unemployment.

The fundamental problem of Braniewo District, strongly emphasised during discussion panels with commune representatives (commune heads and village leaders), is the lack of adequate road infrastructure and transport networks – not only between localities in the commune or district but also between districts and voivodeships. In their opinion, taking organised measures in this respect may contribute to a greater spatial mobility of inhabitants who are in this way provided with an opportunity to search for sources of income outside their immediate place of residence. As jobs are primarily created by leading regional centres, improved access to them via a well-developed transport network (including private carriers) should contribute to the improvement in access to major labour markets. This, in turn, may contribute to the improvement in living conditions of the analysed district inhabitants.

Conclusions, proposals, recommendations

Based on the conducted study, the following recommendations and proposals for action aimed at the improvement of the situation in this „difficult“ labour market in Braniewo District were put forward:

- 1) as regards the institutions having both direct and indirect impact on the labour market: coordination of activities and exchange of information between institutions and organisations involved, both directly and indirectly, in solving problems associated with the labour market, such as: District Employment Office, local self-governments, employers' associations and representatives, the National Support Centre for Agriculture (KOWR); Organisation of profiled training sessions for the unemployed (corresponding to the demand for jobs in Braniewo District), offering internships and intervention works to help gain experience; cooperation with non-governmental organisations in the field of creating new jobs, ensuring conditions for creating new jobs (favourable investment climate).
- 2) as regards education: adjusting the vocational education profile to the requirements of local labour market; supporting schoolchildren in the professional pre-activation through meetings with career counsellors; initiating activities aimed at adjusting the education, including supplementary, to the needs of local labour market; promoting good and effective models for overcoming unemployment.
- 3) as regards support for former state-owned agricultural farm families: individual work with people and families affected by unemployment in order to help them develop responsibility for their own destiny and the skill of adapting to life in today's reality; providing children from the poorest families with scholarship assistance; protecting children against the effects of their parents' unemployment by the provision of basic school equipment, meals, and extracurricular activities; organisation of effective and low-cost care for small children of persons taking up employment and for the elderly and disabled (professional activation of people involved in family care); creation of subsidised work places for the provision of care services.
- 4) As regards transport accessibility: increasing the district inhabitants' mobility through investing in roads (promotion of the „I live in a village and commute to work in a town“ lifestyle); developing a transport network with particular emphasis on the inter-district and inter-voivodeship transport.

Bibliography

1. BDL (2004-2018). *Bank of Local Data. Rynek pracy 2004-2018. Dane podgrup* (Labour market 2004-2018. Subgroup data) Retrieved from: <http://stat.gov.pl/bd/app/> (20.01.2018).

2. Gajowiak, M. (2013). *Deficyt kapitału społecznego na popegeerowskich obszarach jako bariera zrównowalonego rozwoju polskiej wsi* (The deficit of social capital in former state-owned farm areas as a barrier to sustainable development of Poland's countryside). *Folia Pomeranae Universitatis Technologiae Stetinensis: Oeconomica* 299 (70), pp. 71–80.
3. Hartvigsen, M. (2014). *Land reform and land fragmentation in Central and Eastern Europe*. *Land Use Policy* 36 (2014), p. 330-341.
4. Kisiel, R., Marks-Bielska R. (2017). *Transformations of the Polish agriculture*. *Russian Peasant Studies*, 2 (3), p. 108-119.
5. Statistics Poland, Statistical Office in Rzeszów. (2014). *Ruch graniczny oraz wydatki cudzoziemców w Polsce i Polaków za granicą w 2013 r.* (Border traffic, foreigners' expenses in Poland and Poles' expenses abroad in 2013), The Centre of Transborder Areas Surveys and Statistics for Euroregions, Rzeszów.
6. Kopycinska, D. (2018). *Popegeerowskie powiaty – prekariat w województwie zachodniopomorskim* (Former state-owned farm districts – the precariat in Zachodniopomorskie Voivodeship). *Studia i Prace WNEiZ US* 51(3), pp. 185-196.
7. Marks-Bielska, R. (2005). *Byli pracownicy PGR jako „przegrani” transformacji ustrojowej* (Former State-Owned Agricultural Farm employees as the „losers” in the system transformation). *Polityka Społeczna* 7, pp. 9-12.
8. Michalewska-Pawlak, M. (2010). *Możliwości i bariery rozwoju kapitału społecznego na obszarach wiejskich w Polsce* (Possibilities and barriers to the development of social capital in rural areas in Poland) in: „Kapitał społeczny. Interpretacje, impresje, operacjonalizacja”, M. Klimowicz, W. Bokajło (eds.). Warszawa, Wydaw. Fachowe CeDeWu.pl, pp. 185–202.
9. Niedzielski, E., Kisiel, R. (2017). *Przekształcenia własnościowe w rolnictwie – 25 lat historii i doświadczeń* (Ownership changes in agriculture – 25 years of history and experience), Olsztyn, p. 5.
10. Rynki pracy na obszarach popegeerowskich (Labour markets in former state-owned agricultural farm areas), Report of the study (2008), Retrieved from:
http://analizy.mpips.gov.pl/images/stories/publ_i_raporty/pgr.pdf
11. Tarkowska, E. (2000). *Bieda popegeerowska* (Post-state-owned agricultural farm poverty), In: E. Tarkowska (ed.), *Zrozumieć biednego. O dawnej i obecnej biedzie w Polsce* (Understanding the poor. On the poverty of the past and present in Poland). Warszawa: The Institute of Philosophy and Sociology, Polish Academy of Sciences.
12. The Act (1991). *Act of 19 October 1991 on the management of agricultural property of the State Treasury and on the revision of certain Acts*. *Journal of Laws of 1991*, No 107, item 464.
13. The Act (2004). *Act of 20 April 2004 on the promotion of employment and labour market institutions*, *Journal of Laws* No 99, item 1001.
14. Wedrowska, E., Zapotoczna, M. (2004). *Zastosowanie metod taksonomicznych do oceny efektywności zagospodarowania substancji mieszkaniowej po byłych ppgr* (The application of taxonomic methods to assess the effectiveness of development of the former state-owned agricultural farm housing infrastructure) Wyd. AE in Wrocław, *Prace Naukowe* Nr 1023.
15. *Województwo Olsztyńskie. Monografia Ekonomiczno-Społeczna 1945 – 1969* (Olsztynskie Voivodeship. Economic and social monograph 1945 – 1969) (1974), Wojciech Kętrzyński Centre of Scientific Research in Olsztyn, The National Ossolinski Institute, Publishing House, p. 116.
16. Zapotoczna, M., Łaguna, D. (2018). *Wpływ zmian zachodzących w pedestrianizacji wiejskiej na jakość życia mieszkańców w wybranych gminach województwa warmińsko-mazurskiego – część I* (The effects of changes occurring in the rural space on inhabitants' quality of life in selected communes of Warmińsko-Mazurskie Voivodeship – Part 1), *Infrastruktura i ekologia terenów wiejskich*, 1(1), pp. 163-181.
17. Zielinska-Szczepkowska, J., Zabielska, I. (2016). *Mały Ruch Graniczny z obwodem kaliningradzkim FR a rozwój turystyki zakupowej* (Local border traffic between Poland and the Kaliningrad Oblast of the Russian Federation and the development of shopping tourism). *Zeszyty Naukowe Uniwersytetu Szczecińskiego, Ekonomiczne Problemy Turystyki* 1 (3), pp. 349-362.
18. Zielinska-Szczepkowska, J., Zabielska, I., Kisiel, R. (2018). *Turystyka transgraniczna – wybrane aspekty* (Transborder tourism – selected aspects). Wydawnictwo UWM, Olsztyn, p. 119.

COOPERATION BETWEEN SCIENTISTS AND ENTREPRENEURS OF ZEMGALE

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Abstract. Collaboration between scientists and entrepreneurs is a prerequisite for knowledge transfer and place development, creating opportunities for entrepreneurs to develop or improve production and service delivery, as well as quality, by finding innovative approaches to common practice. Scientists, facing new challenges and solutions to them, have the opportunity to showcase their research capacity as well as to introduce stakeholders and the general public with their ideas and solutions. Using a qualitative approach, the authors focused on one of the planning regions of Latvia - Zemgale. The aim of the article is to investigate the problems and solutions of cooperation between entrepreneurs and scientists in Zemgale from the perspective of the involved parties. The tasks are related to the theoretical characterization of scientists and entrepreneurs, as well as cooperation, taking into account the specifics of Zemgale region. The results show that scientists, Zemgale entrepreneurs and experts of the Technology Transfer Centre of Latvia University of Life Sciences and Technologies are directly involved in the implementation of cooperation between scientists and entrepreneurs in Zemgale region. Collaboration is based on the achievement of specific objectives; and the promotion of cooperation in different scenarios varies. It should also be concluded that there are several problems in the attempted cooperation between scientists and entrepreneurs, but the most important are interrelated: the knowledge brokerage in Zemgale region is not one of the priorities; the number of scientists and the quantity of technical equipment are not always sufficient to meet the demand for scientific services; and entrepreneurs are little informed of scientific services, scientific capacity in Zemgale region, therefore they are cautious at the planning stage of cooperation.

Keywords: scientists, entrepreneurs, cooperation.

JEL code: O18; O30.

Introduction

Co-operation between scientists, researchers and entrepreneurs has long been discussed in Latvia, but these discussions have rarely led to significant changes. Co-operation between these two groups of people would contribute to the productivity of different companies (Tisenkopf, Bela, Kunda, 2011; Adamsone-Fiskovica, 2012). Not only is Zemgale considered to be the most fertile region in Latvia, it also has great scientific resources; Zemgale also has business and logistics centres, and it is strategically located - we can talk about different industries that could be supported by appropriate scientific props (Tisenkopfs, Bela, Kunda, 2011; Zemgales planosanas ..., [s.a.]a; Zemgales planosanas ..., [s.a.]b). Currently, cooperation is also promoted from outside - by financial and non-financial means. However, there is a problem: in Latvia, including Zemgale, cooperation between entrepreneurs and scientists is not adequate. The productivity of the Latvian economy is significantly lower than in other European countries, and there are only a few (mostly low added value - auth.) sectors that do not fit the pattern (Ekonomikas ministrija, 2017). Exception areas (positive examples) are animal husbandry and grain production, which, when having appropriate investments, show good results - these are the sectors that have historically experienced the positive impact of innovation on entrepreneurship. The low level of economic productivity is directly related to the lack of scientific input in enterprises; they are not able to compete with the products and services of those countries that have cheaper labour. Scientific associations believe that scientific capacity in terms of both quality and number of scientists in Latvia is sufficient; also the specialization of scientists is broad enough to be used by various enterprises. So this problem situation can be characterized from two sides. The potential of scientists is not sufficiently exploited in business. In turn, entrepreneurship

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lacks creativity (Gulbinska, 2017; Paiders, 2017). From a scientific point of view, the topic in social sciences is current because of the many aspects of this co-operation, but the subject is relatively little researched, especially in quantitative terms. The results of the study are particularly relevant to institutions and organizations that are involved in promoting cooperation, as well as scientists and entrepreneurs. Facilitating knowledge transfer, information and understanding of collaborative issues and possible solutions are helpful in addressing collaborative matters and understanding between stakeholders.

The aim of the article is to investigate the problems and solutions of cooperation between entrepreneurs and scientists in Zemgale region. The main research questions of the thesis are: 1. Who is involved in the implementation of cooperation between scientists and entrepreneurs in Zemgale region and in what manner? 2. How does the promotion of cooperation take place - what benefits are presented to scientists – and what to entrepreneurs? 3. What are the main problems and possible solutions related to the implementation of cooperation between scientists and entrepreneurs in Zemgale region? The goals set for the purpose of the research are related to the outline of the essence of the cooperation theory, which will be used when studying actions and decisions on the implementation of cooperation between scientists and entrepreneurs; to provide theoretical explanation of scientists and entrepreneurs as a social group and to conduct empirical research on the problems and solutions of collaboration between scientists and entrepreneurs in Zemgale region.

Research results and discussion

1. Theoretical aspects of collaboration between scientists and entrepreneurs

Scientist is an academically highly educated individual who collects information, researches, analyses, draws conclusions and makes discoveries, as well as conducts experiments to achieve the goals set for scientific work. From a sociological point of view, science is treated as a social phenomenon, just like entrepreneurship; it is described as a social activity (Bruce, Yearley, 2006; Shapin, 1995).

The prestige of the profession of scientists or public dignity is a significant aspect (Adamsone-Fiskovica, 2012). Society evaluates scientists on their own ideas. The level of education of an individual has a significant impact on the measure of the popularity of science (Tisenkopfs, Bela, Kunda, 2011). Thus, only an educated individual can appreciate the importance of education (including the contribution of science). There is a problem here: if the intellectual level of society is low, then it has No value for knowledge; to change it, it is necessary to educate the public, but it has No motivation to learn, because education has No value in its eyes. This is why social perceptions of science in society, where social and humanitarian sciences and their contribution to the understanding of processes in society are seen as helpful, are important here.

The concept of an entrepreneur has a significant link to the understanding of entrepreneur as a social category. This word is derived from the French word *entreprendre*, which in translation means „do something“. In the Middle Ages, this term was used to refer to „an active person getting (something) done“. In later years, this term has been redesigned and expanded to include the terminology of economic science. Theories of economics were built around this concept, but attempting to do so revealed that entrepreneurship is a phenomenon that social sciences are better able to explain (Swedberg, 2000). From this point of view, entrepreneurship is represented as a

response of socio-economic processes. It explores the role of the entrepreneur and its influencing factors from different perspectives (Thornton, 1999).

The Latvian entrepreneur is interesting for an atypical planning style - he envisions well what he wants to see in his company in the future, but is rarely able to set up and more rarely fulfil the planned tasks to achieve his goals. At present, the scientific contribution is practically topical for those businessmen with greater experience, who not only maintain but also develop the functions of their company. But only innovative entrepreneurship is potentially competitive (Tisenkopfs, Bela, Kunda, 2011). And only such business practices can be sustainable.

The role of an active entrepreneur in a business is very similar to that of a researcher in research. Both groups are also characterized by peculiarities of professional socialization, and they can be an obstacle for possible interaction. Partly this attitude - „not worth it” - has also been promoted by the tradition of anti-intellectualism, and these groups have not had enough time to interact with each other, so other agents, such as knowledge brokers, knowledge transfer centres, etc. are often involved in promoting collaboration between scientists and entrepreneurs.

Cooperation is a phenomenon in which several individuals or groups work together to form a strategic alliance. A strategic association is a deliberate inter-organizational cooperation designed to benefit its partners and stakeholders (Gajda, 2004). Cooperation is a set of interactions of different nature - it can include conflicting, adapting and coercing - reconstructing one's individual social reality (Adler, 2009).

The theory of co-operation can be interpreted in different ways, but the fullest understanding of this concept involves co-ordination, co-operation and working together (Gajda, 2004; Bite, 2012; Kronberga, 2014). So this concept is an intense and versatile form of collaboration characterized by common goals, including benefits, involving multiple individuals, mutual trust, respect, understanding and diversity of knowledge and practice (Bite, 2012). Cooperation is referred to as a kind of phenomenon that occurs only if the preconditions mentioned above coincide with the agents. Cooperation can be explored both as a goal and as a process (Kronberga, 2014). Cooperation is also characterized by its stages of development and levels appropriate to the degree of integration: coexistence, communication (introduction, etc.), coordination (planning, etc.), collaboration and coadunation (continuation of cooperation) (Bite, 2012; Kronberga, 2014). Collaboration could also be described as positively-oriented competition - so the co-operation also determines particular type of behaviour - whether it is only for its own benefit, for the benefit of someone else (for example, an entrepreneur) or a common public good (Tjosvold, 1984; Knopf, 2016). Differences between concepts cooperation and collaboration could be explained through different levels of integration: cooperation as working simultaneously whilst sharing information etc.; collaboration as united and fully integrated co-working with a common goal.

In Latvia, entrepreneurship and science function as separate entities, and the relationship between research and practice should be better targeted with the help of knowledge brokerage. In a sociological sense, it is not just the „selling” of knowledge, but the introduction of elements of one practice into another practice, overstepping the boundaries between scientific disciplines, economic areas, practice competences and other barriers (Tisenkopfs, Bela, Kunda, 2011). The realization of cooperation is influenced by various factors: the prestige of science and scientists in society, popularity of certain branches of science, social perceptions of science, public trust in scientific research, as well as initiative and financial possibilities of organizations (Adamsone-Fiskovica, 2012).

Already today, the role of universities in promoting cooperation is recognized not only in the context of exact sciences but also in social (and humanitarian) sciences. Higher education institutions, their branches and research institutions play a central role in the regions. Their task would be to function according to the needs of the region. Latvia University of Life Sciences and Technologies is a resource for the Zemgale region as it has several scientific institutes as well as a Technology and Knowledge Transfer Centre. However, attention should be drawn to the possibility that entrepreneurs, knowing the extent and competence of their financial and human resources, may not benefit from the attraction of one partner (scientist) and the benefits of such cooperation.

2. Research methodology

Partly structured interviews and expert interviews based on a qualitative research approach are analyzed in the article. The research sample is based on the principles of a targeted sample, partly also using the snowball method. Interviews took place in informant workplaces between March 13, 2018 and May 7, 2018. Interviews lasted from 25 minutes to 1 hour 9 minutes. The article analysis is based on: 1) the views of 6 entrepreneurs (4 of the interviewed entrepreneurs wanted to remain anonymous; therefore, other entrepreneurs will not be revealed within the article. All are from Zemgale region and represent both production and service sphere); 2) the opinions of 2 scientists of the University of Life Sciences and Technologies of Latvia (who have experience in cooperation with entrepreneurs of food technology and construction industry); and 3) the views of 2 experts - Sandra Muizniece-Brasava, Head of Technology and Knowledge Transfer Department, and Ieva Silina, Chairman of the Board of Latvian Young Scientists' Association, that have been focusing on identifying cooperation problems and possible solutions.

3. Implementation of cooperation between scientists and Zemgale entrepreneurs from the perspective of the stakeholders

So far, many attempts have been made to solve cooperation problems between entrepreneurs and scientists in Latvia (including University of Life Sciences and Technologies of Latvia). University of Latvia has organized a seminar on cooperation of scientists with entrepreneurs, EU funds have financed the program „Entrepreneurship and Innovations”, Latvian Association of Young Scientists has repeatedly organized meetings to promote cooperation of scientists and entrepreneurs, also other institutions like LAS; The Association of Local and Regional Governments of Latvia and individual municipalities occasionally (also regularly) organize various co-operation activities.

One of the main problems of Latvia that hinders possible cooperation of entrepreneurs and scientists could be low activity in intellectual property creation and lack of respect for intellectual property, therefore it is necessary to promote not only the public interest, but to find the necessity - to create in entrepreneurs the need (desire) for scientific contribution.

Judging by the planning documents of Zemgale Planning Region, the task of realizing innovations and cooperation in education, creativity and entrepreneurship, as well as promoting cooperation in Zemgale region is indirectly delegated to the University of Life Sciences and Technologies of Latvia, including Technology and Knowledge Transfer Centre. This implies an obligation for the university to take care of the cooperation of scientists and entrepreneurs and to promote it in the Zemgale region (Zemgales planosanas..., [s.a.]; Zemgales planosanas..., [s.a.]; Zemgales planosanas..., [s.a.]).

It should be noted that the sampled entrepreneurs have experience of cooperation (scientist-entrepreneur). For some companies, cooperation was required as a mandatory condition within the project to be implemented. As entrepreneurs admit, some of them have initially formed their own

businesses on a personal or available scientific basis, but 2 informants admit that they have collaborated with scientists not only in their own personal interest, but also to help young scientists conduct the research necessary for the learning process.

Since the personal knowledge base of the individual is already important in the development of cooperation, it is natural for scientists to observe that the courses offered to the general public by the university often serve as a basis for potential future collaboration (e.g., courses offered by Faculty of Food Technology to home producers). Most companies turn to scientists or scientific institutions for help in solving a particular problem. Scientists rely on entrepreneurial interest and relationships in the decision-making process - communication that develops during the co-operation (including its planning). Due to the fact that the research has analysed examples of cooperation, it is logical that the experience of co-operation from the entrepreneurs in most cases is evaluated positively, but the experience of scientists (incl. experts) has been very different.

Entrepreneurs are rather uninterested in events and institutions that promote the cooperation of scientists and entrepreneurs. Scientists rely on the university they are attached to - that it will enable them to work with entrepreneurs. The fact that the entrepreneur's initiative plays a decisive role in the creation of the cooperation is shared by the parties involved and indicates that it is essential for the entrepreneur to understand his need. However, entrepreneurs express a desire for greater interest from scientists and scientific institutions in business potential and collaboration. This can be explained by the fact that awareness raises a greater sense of security - also confidence in cooperation initiatives. Especially when it comes only to initial information - offer, approximate costs, opportunities - where information should be more freely available, so there should be informative, demonstrable examples from the scientific institutions in terms of costs and ideas.

The capacity of scientific human resources is often insufficient. This is pointed out by the expert S. Muizniece-Brasava and the interviewed scientists, as well as some of the entrepreneurs. They also point out that the lack of time is relative, as it depends on the set priorities, referring to the workload of scientists in lecturing and ensuring their academic development (entrepreneurs feel that they bother scientists with their requests - a desire for a scientific service).

Looking at cooperation problems in-depth at university level, we come to the knowledge brokerage, whose principles lead us to conclude that the lack of co-operation is also related to the problems of formation of scientific succession at the level of higher education in Latvia in general. It is assumed that the lack of practical co-operation between entrepreneurs and scientists could also be rooted in a stagnant training system (it does not encourage business confidence in the quality of scientific services).

The entrepreneurs interviewed in the research have encountered an unsatisfactory situation in the supply of scientific services. According to entrepreneurs, the practice of scientific services is outdated, scientifically insufficient and general (lack of specialization). There are spheres in which Latvian scientists have not reached a sufficiently high level of knowledge, but there is also a disagreement among informants - scientists and entrepreneurs tend to have different expectations regarding the outcome of the research (e.g., product quality against expiration dates). Scientists and entrepreneurs have different priorities, including differences in the value systems of the representatives of social groups: if the development of a scientist is predominantly rooted in the desire to explore and discover, then entrepreneurship is based on the goal of earning.

The research also reveals a deeper problem in the field of science in Latvia, also on the background of examples from other countries: 1) awareness of the duty of the future specialists to inform the

public is not promoted; 2) there are No systems of scientific advancement management (although the operation of such a system may need to be reassessed as it may exclude qualitative research that provides data that is not otherwise obtainable in current technological development but is vital for research); 3) Scientific saturation of the business sector as the only solution to the challenges of aging and poverty. However, here it is important to determine whether the society understands the nature of science (method), its task and whether it does not expect the „miracles“ from it unreasonably. In the absence of openness among scientists, not only misconceptions about the ability and scientific capacity of scientists, but also its availability is created - in this case the realization of co-operation opportunities decreases and hopes for increased productivity are essentially futile.

Not always funding projects that integrate science into business support high-level, complex research. If research is promoted (financed) only from the point of view of the co-promoters in (economically) safe research, the development of science is slowed down deliberately. Several respondents also question the usefulness of the projects due to the extensive requirements and bureaucracy.

The study revealed that there are serious problems with the awareness and availability of scientific services. Informants have also stated that the inappropriate focus of business development is set at the planning level of Zemgale region municipalities and Zemgale region in whole.

From the point of view of scientists and businessmen, practically applicable scientific research, not general research activity in science, is essential for the development of cooperation. In this respect, the faculties of the University of Life Sciences and Technologies of Latvia offer students to choose the topics of study papers and final theses on issues that are relevant in the field of professional activity in general or in the region. Concerning the cooperation activity in the Zemgale region, it should be concluded that the cooperation is rather unsatisfactory, as there are few examples of co-operation.

Cooperation problems and their solutions from the point of view of stakeholders.

Informants who have their own scientific experience are aware that the scientific contribution to the development of the business sector can be highly visible and also profitable in terms of return - the economic opportunity is felt in a short period of time, therefore Zemgale entrepreneurs consider the costs of scientific services to be acceptable, but the services are insufficiently modern, as evidenced by the willingness of entrepreneurs to pay more for more advanced research approaches. Entrepreneurs' opinion points to the fact that the promotion of co-operation could be ensured by unique and modern scientific services, so the solution of the situation requires a broad spectrum of scientific services.

Experts, looking from the outside, recommend non-formal activities as an incentive for networking.

In the event that the supply of scientists does not satisfy Latvian entrepreneurs to such an extent that their services become less topical, both scientists and experts see the possibility to sell scientific services in the international market, which could also have a positive effect on cooperation between scientists and entrepreneurs.

In the course of the interviews, as another solution to the problem, which is more directly related to the Zemgale region, there was an idea of cooperation of scientists with builders of production equipment, thus creating high value added production equipment for the entrepreneur.

Entrepreneurs have proven in their experience that external compulsion mechanisms can successfully integrate scientists (or its services) into business. This practice is included in the

European Structural Funds projects and is seen by entrepreneurs as an effective solution to the problem.

Summarizing the main findings of the research, answers to the research questions are found:

1. Scientists, Zemgale entrepreneurs and experts of the Technology Transfer Centre of Latvia University of Life Sciences and Technologies are directly involved in creating collaboration between scientists and entrepreneurs in Zemgale region. Cooperation is based on the achievement of specific objectives.

2. In different scenarios, the promotion of cooperation varies:

- Promoting cooperation by providing financial support to entrepreneurs takes place through LIDA support programs for entrepreneurs, which requires the involvement of a scientist as a mandatory condition for obtaining funding.
- In cases where collaboration is promoted by a prospective scientist working in the company, the entrepreneur is given the opportunity to gain scientific input with minimal time and financial expenses; the benefit for a scientist is the chance to carry out the necessary research to achieve academic goals.
- At the camps organized by the Young Scientists' Association, scientists and entrepreneurs are offered the opportunity to get in touch, get ideas and communicate in an informal atmosphere, offering meaningful leisure opportunities for all parties involved.

3. There are many problems in creating collaboration between scientists and entrepreneurs, but the most important ones are related: since knowledge brokering is not a priority for LUA, the number of scientists and technical equipment is not sufficient to satisfy the demand for scientific services, as entrepreneurs are little aware of scientific services, therefore they are cautious of it from the beginning.

Conclusions, proposals, recommendations

- 1) Science promotion and knowledge brokerage can play a crucial role in the realization of knowledge, interdisciplinary knowledge transfer and collaboration, as well as in the interaction between scientists and other groups in society, thus creating social insights into science.
- 2) Lack of entrepreneurial interest in collaboration with scientists can be explained by the use of „outdated“ methods in the solutions offered by scientists, the deficiencies of technical equipment of scientific institutions; furthermore, the historical background has had a negative impact on the development of current science in Latvia; multiple changes in Zemgale region's business focus directions over the past hundred years have created confusion about the priorities on individual, but also regionally, on institutional level.
- 3) Finding information for an entrepreneur without accumulated contact base can be seen as very weak - lack of informative references and difficult communication make the planning phase of cooperation chaotic, time-consuming and generally ineffective.
- 4) Attracting European Union funds for project implementation ensures collaboration between scientists and entrepreneurs as a mandatory condition for obtaining funding.
- 5) In collaborative projects, entrepreneurs in Zemgale often choose not to engage: the entrepreneur is given too short a time to wait for their turn for scientific services, and involvement in the project is too time-consuming, complicated and unsafe in terms of both wasted resources and copyright (patents).

- 6) The scientific capacity of human resources at the university is not sufficient for the development of knowledge brokerage - scientists are too busy with their daily duties to be able to engage in effective cooperation with entrepreneurs.
- 7) There is a lack of data on regional innovation, but the available data are considered obsolete. In order to find out why cooperation between scientists and businessmen in Zemgale region is not sufficient, it is necessary to carry out more research, finding out the opinion of Zemgale entrepreneurs who have not cooperated so far, as well as those of Zemgale entrepreneurs who have decided to move or start their activity in another region.
- 8) In order to stimulate the interest of entrepreneurs in cooperation with scientists, it is necessary to improve the availability of information for future cooperation partners - each faculty would need to develop an offer of scientific services for entrepreneurs, which (in an easily visible form) would be available on university and faculty websites, including: 1) available scientific services, 2) approximate service prices or examples of costs for scientific services and 3) inventory of materials and technical equipment, etc.
- 9) In order to promote the transfer of knowledge for profit, the university must identify, evaluate its confidence in the supply of scientific services, and compare it with the supply of other countries and assess the possibilities of investing in technology: 1) if it is not possible to invest in technical support, then (while taking care of the succession of knowledge), it is necessary to promote the retention of new potential scientists at the university with a motivating pay system for human resource development - in this scenario, offering the services (as comparatively cheaper) in other countries; 2) if priority is given to regional (and / or local) cooperation and joint development, long-term investment in both the material and technical resources and human resources and their training must be made.

Bibliography

1. Adamsone-Fiskovica A. (2012) Zinatnes un sabiedrības attiecības Latvija: komunikatīvas prakses un diskursi (Science and Society Relations in Latvia: Communicative Practices and Discourses). Retrieved: https://www.szf.lu.lv/fileadmin/user_upload/szf_faili/Petnieciba/promocijas_darbi/Adamsone-Fiskovica %20Promocija_aizsargats.pdf Access: 10.12.2017.
2. Adler P.S. (ed.) (2009) The Oxford Handbook of Sociology and Organization Studies: Classical Foundations. Oxford: Oxford University Press. 679 p.
3. Bite D. (2012) Pasvaldību sadarbība Latvija (Local Government Cooperation in Latvia). Retrieved: https://www.szf.lu.lv/fileadmin/user_upload/szf_faili/Petnieciba/promocijas_darbi/Dina %20Bite %202012.pdf Access: 02.07.2018.
4. Bruce S., Yearley S. (2006) The Sage Dictionary of Sociology. London: Sage Publications. 328 p.
5. Ekonomikas ministrija (Ministry of Economics) (2017) Aseradens: 2017. gada ir javeido jauns inovatīvas ekonomikas modelis (Aseradens: In 2017, We Need to Develop a New Innovative Economic Model). Retrieved: <https://em.gov.lv/lv/jaunumi/13219-aseradens-2017-gada-ir-javeido-jauns-inovatīvas-ekonomikas-modelis> Access: 10.03.2018
6. Gajda R. (2004) Utilizing Collaboration Theory to Evaluate Strategic Alliances. *American Journal of Evaluation*, Vol. 25, No. 1, pp. 65-77
7. Gulbinska P. (2017) Zinatnieku un uzņēmēju sadarbība – situācija Latvija (Cooperation Between Scientists and Entrepreneurs - Situation in Latvia). Retrieved: <http://lr1.lsm.lv/lv/raksts/zinamais-nezinamaja/zinatnieku-un-uznemeju-sadarbiba-situacija-latvija.a89671/> Access: 02.12.2017
8. Knopf W. J. (2016) International Cooperation on WMD Nonproliferation. Retrieved: https://books.google.lv/books?id=Rg7UCgAAQBAJ&pg=PA6&lpg=PA6&dq=cooperation+theory&source=bl&ots=KrluOZwwZx&sig=sDC_-LBhJy1yMUKBz3PThysYZNA&hl=en&sa=X&ved=0ahUKEwjBtvyylcnYAhUMEiwKHR6QCnA4HhDoAQg7MAI#v=onepage&q=cooperation %20theory&f=false Access: 31.12.2018
9. Kronberga G. (2014) Augstskolas zināšanu pārnese Latvija (Universities in Knowledge Transfer in Latvia). Retrieved: https://www.szf.lu.lv/fileadmin/user_upload/szf_faili/Bauhausi/Kronberga_Ginta_Augstskolas_zinasanu_parnese_Latvija_2014_pdf.pdf Access: 10.12.2017.

10. Paiders J. (2017) Kapu zvans inovaciju atbalstam! (Tomb Call for Innovation Support!). Retrieved: <http://nra.lv/latvija/juris-paiders-3/222775-kapu-zvans-inovaciju-atbalstam.htm> Access: 10.12.2018.
11. Shapin S. (1995) Here and Everywhere - Sociology of Scientific Knowledge. *Annual Review of Sociology* 21 pp. 289-321. Retrieved: <https://pdfs.semanticscholar.org/2829/a6eb141434877e67d60b1b60a04ac0e484ac.pdf> Access: 11.01.2018.
12. Swedberg R. (2000) The Social Science View of Entrepreneurship: Introduction and Practical Applications. Retrieved: http://people.soc.cornell.edu/swedberg/2000_%20The_%20Social_%20Science_%20View.pdf Access: 11.01.2018.
13. Thornton H. P. (1999) The Sociology of Entrepreneurship. Retrieved: https://www.researchgate.net/publication/228697727_The_Sociology_of_Entrepreneurship_Annual_Review_of_Sociology Access: 10.01.2019.
14. Tisenkopfs T., Bela B., Kunda I. (red.) (2011) Augstskolas regionos: zināšanu un prakses mijiedarbe (Universities in Regions: Interaction of Knowledge and Practice). Riga: SIA Apgads „Zinātne”. 495 lpp
15. Tjosvold D. (1984) Cooperation Theory and Organizations. Retrieved: https://www.researchgate.net/publication/247716944_Cooperation_Theory_and_Organizations Access: 02.01.2019.
16. Zemgales planosanas reģiona attīstības programma 2015-2020. Strategiska daļa (Zemgale Planning Region Development Program 2015-2020. Strategic Part) [s.a.]d. Retrieved: <https://www.zemgale.lv/index.php/attistibas-planosana/planosanas-dokumenti/category/35-zpr-attistibas-programma-2015-2020> Access: 24.05.2018.
17. Zemgales planosanas reģiona ilgtspējīgas attīstības stratēģija 2015-2030, attīstības programma 2015-2020 ESOSAS SITUĀCIJAS RAKSTUROJUMS (Zemgale Planning Region Sustainable Development Strategy 2015-2030, Development Program 2015-2020 DESCRIPTION OF EXISTING SITUATION) [s.a.]a. Retrieved: <https://www.zemgale.lv/index.php/attistibas-planosana/planosanas-dokumenti/category/37-zpr-esosas-situacijas-analize> Access: 24.05.2018.
18. Zemgales planosanas reģiona ilgtspējīgas attīstības stratēģija 2015 – 2030 (Zemgale Planning Region Sustainable Development Strategy 2015-2030) [s.a.]b. Retrieved: http://www.jelgava.lv/files/2_zpr_ias.pdf Access: 10.12.2017.

SUSTAINABILITY OF MINERAL RESOURCES IN LATVIA

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Abstract. Sustainable use of mineral resources involves the interaction of economic, environmental and social processes, in which economic interests have to be adapted to the other interests. Sustainable management of mineral resources has to take into consideration the location, quality and uses of the resources. The above requires exploiting natural resources in the most efficient way so that the needs of mankind could be met in the future. The following mineral resources are extracted in all the five planning regions of Latvia: gypsum, limestone, dolomite, quartz sand, sand, gravel and clay. The quality of mineral resources is classified into categories: A – mineral resource reserves, N – incompletely explored resources and P – unexplored resources have been discovered, which play an important role in defining the uses of the resources. Mineral resources are extracted and used in the construction, repairs and maintenance of roads as well as in the construction of buildings. The research problem raises a question whether the exploitation of mineral deposits or mineral resources generates economic gains and whether the extraction and consumption of mineral resources increases with an increase in the standard of living in the country. Based on this the research aim was to analyse the extraction of mineral resources in Latvia as a whole and in the planning regions of Latvia. Research results and a comparative analysis revealed that the quantity of mineral resources extracted was not strongly related to the other economic indicators, i.e. the extraction and consumption of mineral resources did not directly affect economic growth in the country. However, part of mineral resources was extracted at partly explored extraction sites, accounting for approximately 8 % of the total quantity extracted. This economic activity was legal, yet it was not sustainable and did not comply with the sustainability strategies of the European Union as well as Latvia.

Key words: mineral resource, extraction, sustainability.

JEL code: Q01; Q32

Introduction

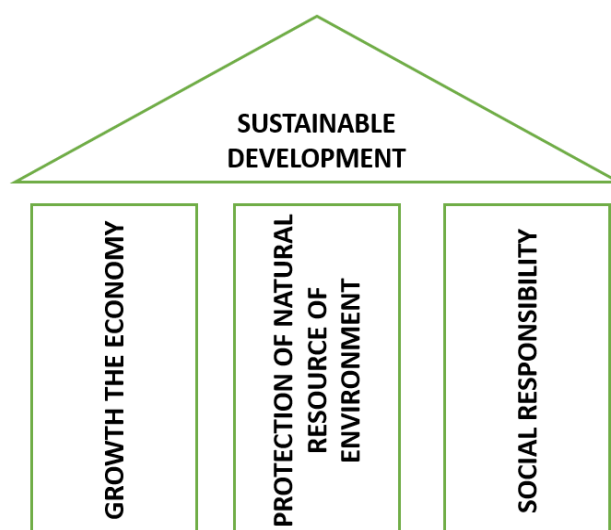
Land contributes to sustainable development and is the basis of economic activity. The characteristics of land are as follows: physical phenomena (soil, underground minerals, irrigation/drainage systems, land uses); infrastructure; the location and the environment; the ownership, use and value of land (Auzins A., 2016). Underground minerals are important as a physical phenomenon, as they are resources explored or partly explored and have some value (Lazdins A., 2016). In Latvia, the diversity of mineral resources is not broad, yet the available resources contribute to economic development and are important for manufacturing construction materials; therefore, the resources have to be exploited in a sustainable way. The key mineral resources that are extracted, processed and used are as follows: gypsum (G); limestone (L); dolomite (D); clay (C); sand (S); quartz sand (QS); gravel (G); sand – gravel – sand (SGS) (Kurss, V., Stikule, A., 1997). Most of the mentioned mineral resources are used in construction and in manufacturing construction materials. However, in the past decades question about sustainable extraction and exploitation of mineral resources has been set in Latvia. Therefore, the following hypothesis is put forward – the extraction, processing and utilization of Latvian mineral resources is sustainable. The **research aim** is to analyse the extraction of mineral resources in Latvia as a whole and in the planning regions of Latvia. The **research tasks** are as follows: 1. To discuss theoretical aspects on sustainable use of mineral resources. 2. To perform an analysis of available mineral resources in Latvia. **Research methods:** monographic – the information sources were analysed, compared and described; data were processed and interpreted by use of statistical analysis and interpretation methods. **Research novelty** – the extraction and use of mineral resources is

impossible to analyse in the resource circulation context, as it involves land use, and the mineral resources represent the basis of a circular economy and a bioeconomy.

Research results and discussion Mineral resources are minerals whose extraction and use is constrained (they are non-renewable), and their reuse is problematic, in many cases impossible, as their chemical and physical properties change during recycling (e.g. burning), which is an irreversible process (Law On Subterranean Depths, 1996). The sustainability of mineral resources could be ensured by their reasonable and efficient exploitation in the national economy (Seglins V., 2007; Lazdins A., 2016). It is important to implement a sustainable strategy on mineral resources, which is the basis of sustainable management.

The implementation of „sustainable development“ means the integration of activities in the following three key areas, namely (Figure 1):

- technical and economic activities ensuring economic growth;
- ecological activities ensuring the protection of natural resources and the environment;
- social activities, meaning care for the employee at the workplace and community development in the area of mining activities (Dubinski J., 2013; Role of Government in Mineral..., 2011).



Source: authors' calculations based on Sustainable Development of Mining Mineral Resource (Dubinski J., 2013)

Fig. 1. Elements of sustainable development

The sustainable extraction and exploitation of resources ensures economic growth involving No new resources as well as environmental impact reduction and social responsibility. Ensuring the sustainability of mineral resources pertains to the model of five types of capital: natural; human; social; physical; and financial (Corder G., 2015; Dubinski J., 2013; Sustainable development..., 2013). Coordinated management of all the types of capital could contribute to sustainable resource use; it is particularly important to coordinate the extraction and exploitation of non-renewable resources (Alfsen K.H., Greker M., 2007).

One of the most essential aspects is updated information on available mineral resources and the known and newly discovered properties of the resources as well as public education about the role of resources in personal life and public life as well as in community life (Finland's Minerals Strategy..., 2010; Developments in indicators..., 2012).

An analysis of the above opinions allows finding differences between a conventional economy and a sustainable economy – the conventional economy contributes to an increase in the consumption of goods and services, whereas the sustainable one pertains to shaping an understanding of the effects

of growing population wishes on the opportunities for future generations to raise their standard of living.

The European Union concept of sustainable development is based on considerations representing a broad spectrum of policy activities aimed at satisfying current needs without compromising the ability of future generations to use resources and meet their needs. To achieve the goals, four interrelated pillars have been defined: economic, social, environmental as well as the pillar of global-scale governance. The priority sustainable development areas are as follows: climate change, transport, production and consumption patterns, natural resource management, public health, social exclusion and poverty and poverty reduction throughout the world (Sustainable Development in the European Union, 2013).

In Latvia, sustainable development is referred to in the strategy Latvia 2030; the basic idea is to meet the needs of the current generation by balancing the society's prosperity, environmental and economic interest while also protecting the environment and preserving diversity in nature without compromising the ability of future generations to meet their needs. The document's section Sustainable Management of Natural Values and Services defines natural capital as non-renewable natural resources: minerals (sand, gravel, clay, gypsum, dolomite) and renewable natural resources: soil, wood, energy etc. To effectively manage natural capital, it is necessary to determine the critical level of natural capital, below which it may not decrease, and set goals and targets for the preservation and restoration of natural capital. Accordingly, a comprehensive analysis of natural capital available in Latvia has to be performed, comparing the baseline situation with a reference level or a benchmark. Such an analysis would allow setting long-term requirements for sustainable management, various habitats and the areas necessary for the habitats and assessing which ecosystems need protection and which could be intensively managed (Latvija 2030, 2010).

As regards the use of underground minerals in Latvia, subterranean depths, including mineral deposits, belong to the land owner in accordance with the Civil Law. However, to contribute to sustainable resource use, the state sets its requirements in accordance with the Law on Subterranean Depths and the Law on Environmental Impact Assessment, and a compromise is achieved among the interests of the land owner, the needs of the state and environmental protection requirements based on other legal documents (Zemes dziles, [s.a.]).

Mineral resources are extracted in open quarries, removing topsoil (1-20 cm in depth) that is not useful for this purpose. Quarrying is widespread in all the five planning regions of Latvia (Kurzeme planning region – KPR, Zemgale planning region – ZPR, Riga planning region – RPR, Latgale planning region – LPR and Vidzeme planning region – VPR); the beneficiaries are natural and legal persons. The extraction of mineral resources could be started after a licence for use of subterranean depths has been acquired and a project for extraction of mineral resources has been developed (Par zemes dzilēm..., 2013).

Table 1

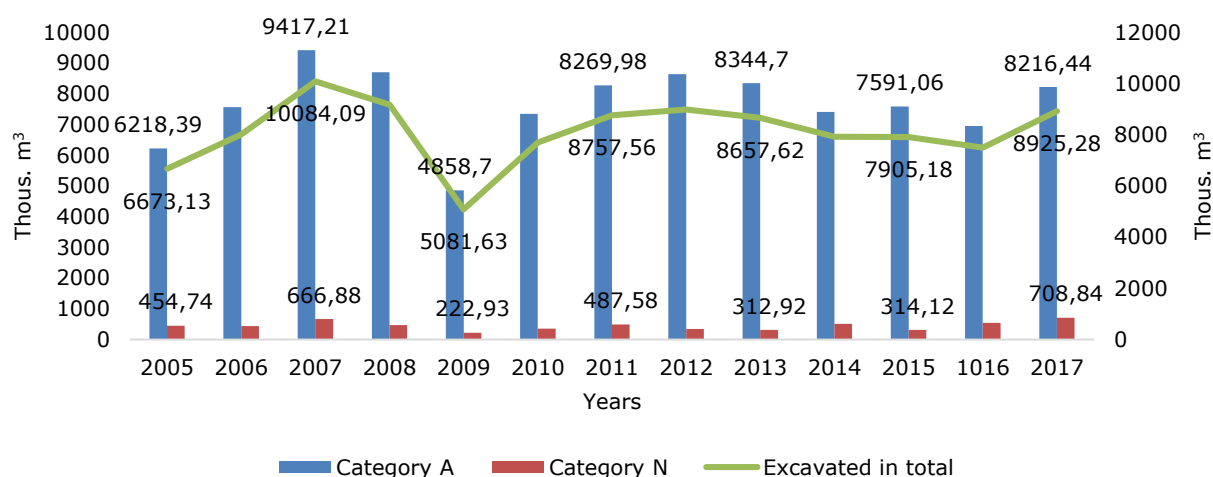
Mineral resource stock categories

Categories	Description of categories
Category A	Explored reserves of mineral resources
Category N	Estimated mineral reserves (incomplete geological exploration)
Category P	Predicted mineral resources (stocks are valued by analogy)

Source: authors' calculations based on Cabinet Regulation No. 570

In quarrying, an important criterion is the extraction of explored mineral resources, which is a guarantee that the resources meet the needs of an enterprise to achieve its particular goals. In accordance with the Cabinet Regulation Procedures for the Extraction of Mineral Deposits (2006), mineral deposits are divided into three categories. Mineral resource licences are granted for the extraction of categories A and N mineral resources, while No licence is needed for the extraction of category P mineral resources because their extraction is prohibited (Table 1).

An analysis of the extraction of mineral resources for the period 2005-2017 revealed that the quantities extracted did not tend to increase significantly. After a decrease observed in 2009 (5081.63 thous. m³), the output of mineral resources stabilised until 2017 (Derigo izraktenu krajumu bilance, 2017).

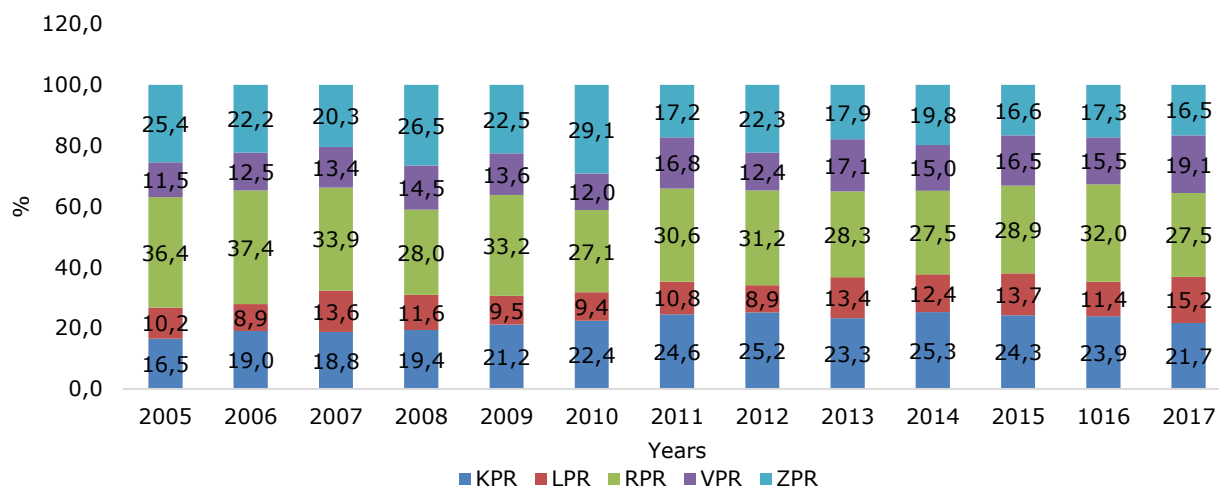


Source: authors' calculations based on LEGMC data (Derigo izraktenu krajumu bilance, 2017)

Fig. 2. Changes in the extraction of mineral resources in Latvia in 2005-2017, thousand cubic meters

In the period 2010-2017, the quantities extracted ranged from 6954.26 thous. m³ in 2016 to 8641.31 thous. m³ in 2012 (Figure 2). Overall, No considerable changes in the extraction of mineral resources of categories A and N were observed.

An analysis of the percentage breakdown of the extraction of mineral resources by planning region revealed that Riga planning region with a proportion of 27.1-37.4 % was the largest producer of mineral resources, followed by Kurzeme planning region with a proportion of 16.5-29.1 %.

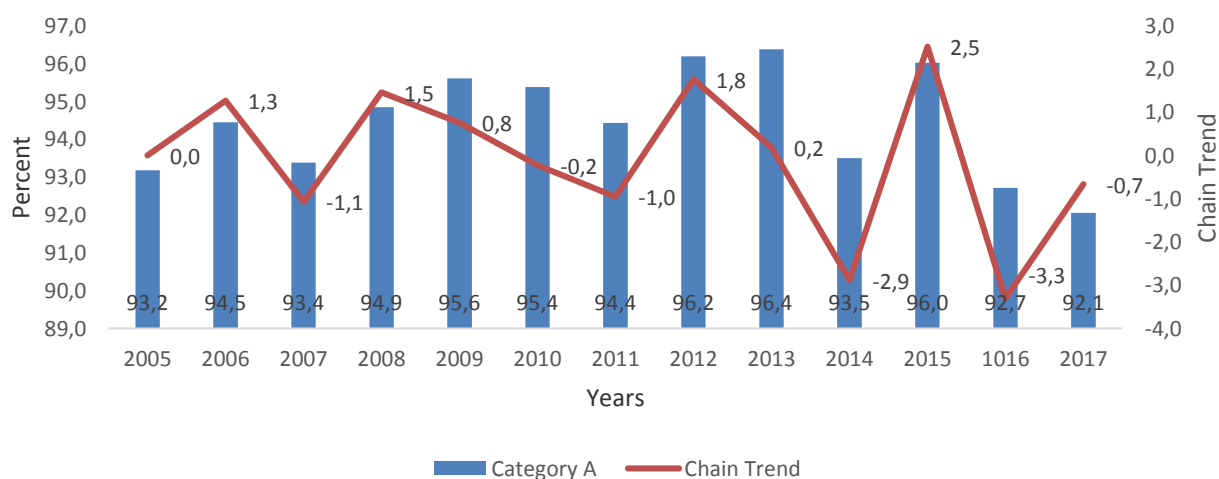


Source: authors' calculations based on LEGMC data (Derigo izraktenu krajumu bilance, 2017)

Fig. 3. Percentage breakdown of the mining of mineral resources in the planning regions of Latvia in 2005-2017

The smallest producer of mineral resources was LPR with a proportion ranging from 8.9 % to 15.2 % (Figure 3). The extraction of mineral resources was affected by a number of socio-economic factors related to the development of infrastructure objects and the population in the planning regions. Vidzeme planning region was the second smallest producer of mineral resources – the output of mineral resources ranged from 8.9 thous. m³ to 15.2 thous. m³ a year. In Zemgale planning region, the output ranged from 16.5 thous. m³ to 29.1 thous. m³ a year.

A prerequisite for sustainable exploitation of mineral resources is knowledge of the resources to be extracted and their quality. In Latvia, licences are granted for N category mineral resources (Table 1), which are not completely explored and there are No accurate data on their quality characteristics.



Source: authors' calculations based on LEGMC data (Derigo izraktenu krajumu bilance, 2017)

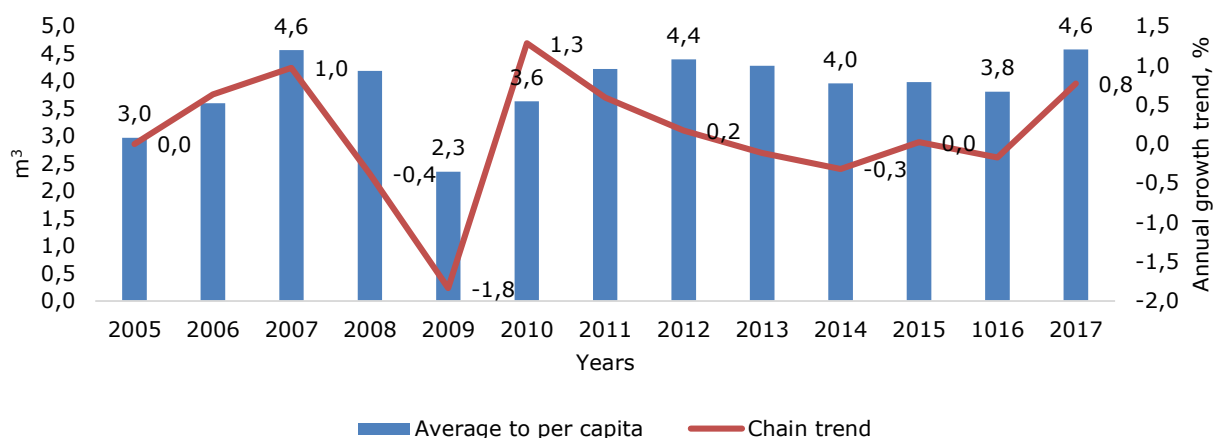
Fig. 4. Mining of category A mineral resources as a percentage of total and the annual growth trend in Latvia in 2005-2017

An analysis of the extraction of mineral resources by category for the period 2005-2017 revealed that the extraction of category A mineral resources dominated, ranging from 92.1 % to 96.2 %, while the extraction of category N mineral resources ranged from 7.9 % to 3.8 % (Figure 4).

No explicit trend in the extraction of category A mineral resource was observed, and only in recent years, i.e. in 2016 and 2017 the output of category N mineral resources considerably rose by 6.8 % un 7.9 %, respectively, which was in line with the fast growth in construction (increase in demand for mineral resources).

An analysis of the extraction of mineral resources in per capita terms showed that the figures were relatively similar. The largest decrease was observed during the economic crisis, only in one year, i.e. in 2009.

The extraction of mineral resources is influenced by several factors: prepared projects; funds for construction and maintenance; public procurement. In general, the extraction and use of mineral resources is influenced by national economic growth, this is evidenced by the economic crisis of 2009, when resource extraction fell sharply (Figure 2; 5).



Source: authors' calculations based on LEGMC and CSB data (*Derīgo izraktenu krajumu bilance, 2017*)

Fig. 5. Mining of mineral resources per capita in the country, the annual growth trend in 2005-2017, cubic meters

In 2009 in Latvia, the per-capita output of mineral deposits was 2.3 m³. In the other years of the analysis period, it ranged from 3.0 m³ to 4.6 m³ (Figure 5). No statistical data were collected on quarrying, and only professor V.Seglins has stated that the per-capita output of mineral deposits in Latvia is estimated at 1.8 m³ (Seglins V., 2007). Figure 5 shows that decreases in the population of Latvia have not affected the output of mineral resources, and only large economic shocks have made temporary effects.

The extraction, processing and consumption of mineral resources is not strongly related to economic growth in the country, yet long-term effects are possible, as the resources are used for road construction as well as the construction and maintenance of structures in the business, private and public sectors. Investments in such economic activities contribute to the sustainable use of other resources, yet such effects have not been researched in Latvia.

Conclusions, proposals, recommendations

- 1) The authors stress that the sustainability of mineral resources is associated with the sustainable management of extraction and exploitation of the mineral resources and public participation in making decisions on resource extraction and profit distribution, which requires higher public responsibility and leads to lower environmental impacts. With the increase in the extraction and utilization of mineral resources, public participation should increase in this process.

- 2) An important prerequisite for the sustainable extraction and exploitation of mineral resources is the acquisition of new knowledge through engaging scientists in research on and public education about mineral resources and their role in public life and the life of every individual.
- 3) The exploitation of mineral resources in Latvia is sustainable because the resources are used in the construction of infrastructure and private and public buildings (Fig. 2), which contributes to the sustainable and rational use of other resources for economic development and growth.
- 4) Overall, the extraction and consumption of mineral resources in the planning regions of Latvia is done in accordance with the legal framework and controlled by accounting for the resources and granting licences for use of subterranean depths in accordance with the relevant Cabinet regulation.
- 5) The use of mineral resources for the construction and maintenance of infrastructure and private, commercial and public buildings affects the sustainable exploitation and maintenance of other resources, yet more research has to be done on a potential causal association between economic efficiency and sustainability for the resources.
- 6) Mineral extraction rates (2005 - 2017) show a steady trend, except for the mineral resource extraction rate during the 2009 economic crisis, where the direct impact of the country's economic situation is felt (Fig. 3, 5).

Bibliography

1. Auzins, A. (2016). Zemes izmantosanas novērtesana un parvaldība (Land Use Assessment and Management). Scientific monograph, Riga: RTU, 270 p.
2. Alfsen, K.H., Greker, M. (2007). From Natural Resources and Environmental Accounting to Construction of Indicators for Sustainable Development. *Journal: Ecological Economics*, Volume 61, pp. 600-610.
3. Corder, D.G. (2015). Insights from Case Studies into Sustainable Design Approaches in the Minerals Industry. *Journal: Minerals Engineering* No 76, pp. 47-57.
4. Derigo izraktenu (būvmaterialu izejvielu, kuras un dziedniecisko dunu) krajumu bilance par 2005. – 2017. gadu (2019) (Stocks of Mineral Deposits (Construction Materials, Peat and Medicinal Mud) for the period 2005-2017. Retrieved: <https://www.meteo.lv/lapas/geologija/derigo-izraktenu-atradnu-registrs/derigo-izraktenu-krajumu-bilance/derigo-izraktenu-krajumu-bilance?id=1472&nid=659> pdf. Access: 10.01.2019.
5. Derigo izraktenu ieguves kartība (2012) MK noteikumi Nr. 570 (Procedures for the Extraction of Mineral Resources. Cabinet regulation No. 570). Retrieved: <https://likumi.lv/doc.php?id=251021> Access: 05.01.2019.
6. Developments in indicators: Total Material Requirement (TMR). (2000) European Environment Agency. Retrieved: <http://www.eea.europa.eu/publications/signals-2000/page017.html>.
7. Dubinski, J. (2013). Sustainable Development of Mining Mineral Resource. *Journal of Sustainable Mining* 2014, No. 12, pp. 1-6.
8. Finland's Minerals Strategy. (2010). Retrieved: https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/system/files/ged/42_20FinlandsMineralsStrategy.pdf. Access: 20.01.2019.
9. Kurss, V., Stikule, A. (1997) Latvijas derīgie izrakteņi (Mineral Deposits in Latvia). Riga: LU. 200 p.
10. Lazdins, A. (2016). Development of the Mineral Resource Market in Latvia's Regions (Summary of the Doctoral Thesis for the Degree Dr.oec.). Jelgava. 117 p.
11. Par zemes dziļiem (Law on Subterranean Depths): law of the Republic of Latvia (1996). Latvijas Vestnesis, No.87 (572), 21 May 1996.
12. Role of Government in Mineral and Energy Resources Research. The Geological Society of America. (2011). GAS. Retrieved: www.geosociety.org.
13. Seglins, V. (2007) Zemes dziļu resursi (Resources of Subterranean Depths). Riga: Publisher RaKa. 380 p.
14. Sustainable Development in the European Union. (2013) 2013 Monitoring Report of the EU Sustainable Development Strategy. *Eurostat report*. European Union. Retrieved: <https://ec.europa.eu/eurostat/documents/3217494/5760249/KS-02-13-237-EN.PDF>. Access: 15.01.2019.

SUSTAINABLE MANAGEMENT OF MINERAL RESOURCES IN THE CONTEXT OF JSC „LATVIA'S STATE FORESTS" CIRCULAR ECONOMY

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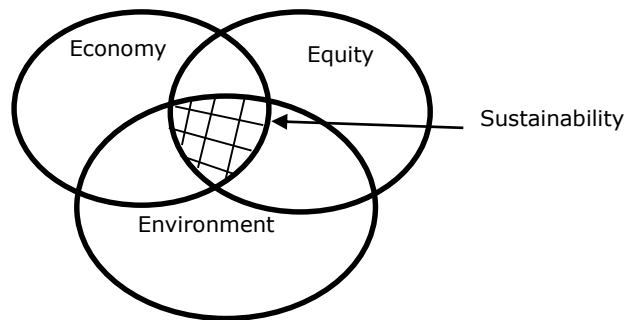
Abstract. Sustainability of mineral resource is linked with governing the reciprocity of economic, environmental and social processes in which the economic interests need to be made compatible with the other processes. Sustainable management of mineral resources needs to be linked with the notions of ecology and circular economy in which an opinion exists that depletion of mineral resources by itself undermines economic growth and determines the need for the most efficient ways of using natural resources in business so that maintaining natural systems could support human life and welfare also in the future. JSC „LATVIA'S STATE FORESTS" manages state owned land covering the area of 1.62 million hectares, including 1.60 million hectares of forest land, out of which 1.39 million hectares are covered by forests. Since 2002, JSC „LATVIA'S STATE FORESTS" has built forest roads (FR) in the length of approximately 5.6 thous. km and as of January 2018 the total length of FR had reached 11.8 thous. km. Extraction of mineral resources and their use in building, repairing and maintaining forest roads is the company's investment in the future, as well as it makes easier the management and monitoring of forest territories, output of forests, accessibility of forests and improves the forest landscape. The research problem addresses the question whether the use of mineral resources is linked with economic benefits, whether with the growth of the company's profit the volume of extraction of mineral resources also increases. Evaluating the comparative indicators, it can be observed that the extraction of mineral resources is not closely correlated with other economic indicators – extraction and use of resources do not impact directly on the final result of the company's operations – acquiring profit. However, in the case of JSC „LATVIA'S STATE FORESTS" the problem is related with the places where mineral resources are extracted – on average about 8 % of the mineral resources are extracted in new, partly researched deposits. Such an activity is legal, but it is not sustainable and does not correspond to the sustainable strategy of the European Union, nor the one of Latvia.

Key words: sustainability, mineral resources, circular economy.

JEL code: Q01; Q32.

Introduction

The use of mineral resources in relation with economic benefits regarding whether when the company's profit grows, the volume of extraction of mineral resources increases and whether the principle of sustainable management of mineral resources – sand and gravel – is followed in the extraction process is still little researched in Latvia. **Research hypothesis** – when building the forest infrastructure, JSC „LATVIA'S STATE FORESTS" practise principles of sustainable management of mineral resources. **Research goal** – to analyse the experience of sustainable management of mineral resources in JSC „LATVIA'S STATE FORESTS" in the context of circular economy. **Research tasks:** 1. to collect information on theoretical aspects on sustainable management in the context of mineral resources. 2. to perform data analysis in JSC „LATVIA'S STATE FORESTS" (LSF) on the connection between building the forest infrastructure with the profit indicators of the company and principles of sustainable management of mineral resources. **Research methods:** content analysis of literature and internet sources was performed to prepare the research paper, the selected data were processed and interpreted applying statistical data processing and interpretation methods. The analysed period was from 2006 till 2017. **Research innovation** – up to now the analysis of the results of sustainable management of mineral resources had not been conducted in JSC „LATVIA'S STATE FORESTS". Publicly available information about the performance indicators of JSC „LATVIA'S STATE FORESTS" and data of the Latvian Environment, Geology and Meteorology Centre (LEGMC) were used in the research.



Source: created by authors, *The Brundtland Report, 1987*

Fig. 1. **The three overlapping elements of sustainability**

Sustainability is mentioned first in the UNO Brundtland report as a necessity to develop balanced use of non-renewable natural resources, not endangering natural systems that ensure life. Sustainability is explained as interaction of three E elements – environment, economy, equity – upon the condition that sustainable economic growth and development is possible when preserving the environment and acting in equitably (The Brundtland Report, 1987).

Having collected various theoretical definitions of sustainability and its influencing factors, the following statements can be highlighted:

- Sustainability is connected with the function of social and political values and knowledge that determines human behaviour (Robinson et al, 1990);
- Sustainability is defined as „sustainable use of biological resources“, „sustainable agriculture“ , „capacity“, „sustainable energy“, „sustainable society and sustainable economy“ and „attainable development“ (Portney, 2015);
- Sustainability is linked with consumption, which creates a link between the economic development and the degradation of the environment. Different level governments and countries' policies should be involved in ensuring sustainability (Portney, 2015);
- Brown et al. (1987) relate sustainability to the rate of tree output so that the growth of a forest would be balanced, as well as forest management and development of the infrastructure should be considered higher level social and cultural needs, such as the aesthetic values of a forest.

Table 1

A summary of the foundation and definitions of sustainability

Six roots of sustainability	Six definitions of sustainability	Points of emphasis
Ecological	Movement capability	Maintaining nature systems so that they could support human life and welfare
Resources/environment	Sustainable use of biological resources	Facilitating economic growth only in such a scope and manner that does not cause worsening of nature systems
Biosphere	Sustainable agriculture	Relations between the human impact on the health of the Earth and its ability to support human population
Technology criticism	Sustainable energy	Refusing from the opinion that science and technology themselves will protect and save the Earth
No growth – slow growth	Sustainable society and economy	Restrictions regarding the capability of the Earth to support increasing human health and welfare
Ecological development	Sustainable development	Adjusting business and economic development activities to the reality of natural resource and environment limitations

Source: created by authors *B. Brown et al., 1987 and C. Kidd, 1992*

B. Brown et al. (1987) and C. Kidd (1992) (see Table 1) developed ideas and highlighted the intellectual bases of sustainability, in which six meanings merge around two main aspects: ecology and those that highlight economy.

Gathering opinions, it is possible to find differences between general and sustainable economy – general economy concerns promoting the increase of goods and services while sustainable economic development is about developing an understanding about the impact of the increase of desires on the ability of the future generations to improve their welfare.

Within the framework of sustainable development, the European Union (EU) provides a wide policy system to satisfy the current needs, not endangering the ability of future generations to satisfy their needs. Four mutually related pillars are determined to attain the goals: economy, social, environmental and world level governance. The priority areas of sustainable development are: climate changes, transportation, types of manufacturing and consumption, managing natural resources, public health, social exclusion and poverty and fight with global poverty (European Commission, 2004).

Research results and discussion

Sustainable development of Latvia is mentioned in the document „Latvia 2030”, whose basic idea is to satisfy the needs of the present generation balancing the interests of public welfare, environment and economic development, simultaneously also ensuring that environmental requirements are observed and the nature diversity is preserved not to reduce the opportunities of satisfying the needs of future generations. In the chapter „Sustainable Management of Nature Values and Services” the following are determined: Nature capital – non-renewable natural resources: minerals – sand and gravel, renewable natural resources – land, wood, energy a.o. To manage the nature capital effectively, it is necessary to determine the critical nature capital whose reduction is not to be allowed, and the objectives and indicators of preserving and renewing the nature capital. Therefore, a comprehensive analysis of the lack of nature capital in Latvia should be performed, which would compare the current situation with its reporting or benchmark level. As a result of such analysis, long-term requirements regarding sustainable management of resources for various biotypes and the areas they need could be set, evaluating which ecosystems need protection, which – active management and which require the restauration of the life-world (Sustainable, 2010).

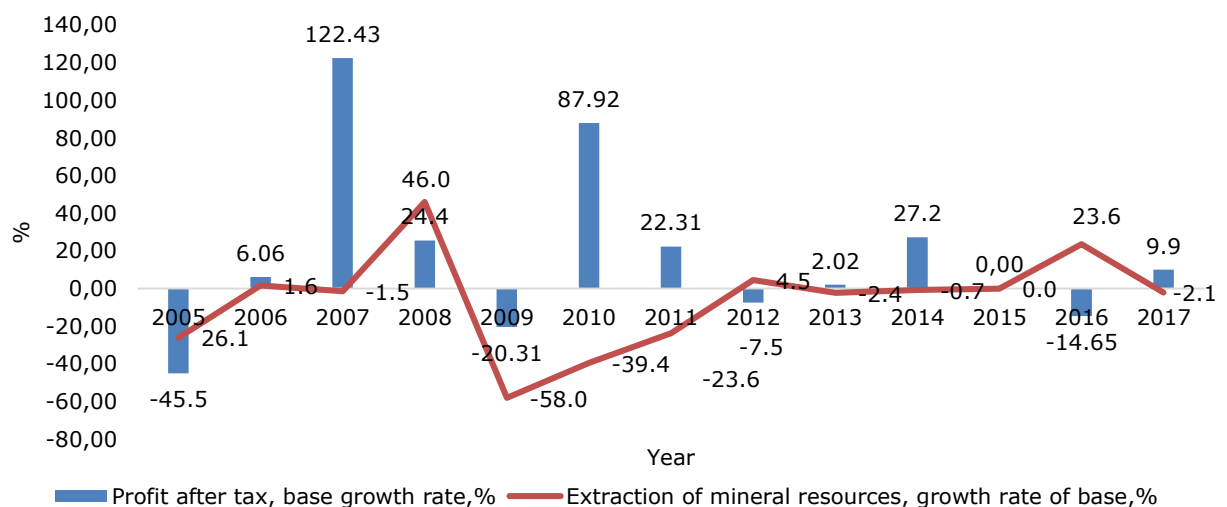
According to the data of the Ministry of Environmental Protection and Regional Development, the non-renewable resources of Latvia are gypsum, limestone, dolomite, quartz sand, clay, sand and gravel. Based on the researched and evaluated stock of mineral resources and the extraction volume in 2013, gypsum will last for 50 years, sand – for 100 years, dolomite – for 210 years, clay – for 1130 years and limestone – for 1310 years. According to the Civil Law, in Latvia, the entrails of the earth, including mineral resources, belong to the land owners. However, to ensure sustainable use of resources, the state sets its conditions. Implementing the law „On the entrails of the earth”, the law „On the evaluation of the impact on the environment” and other laws and regulations, a compromise between the interests of the land owners, the development needs and the environment protection requirements is achieved (Subterranean depths, 2019).

JSC „LATVIA'S STATE FORESTS” was founded in 1999, and it has set several strategic goals. One of the main strategic goals the company has set is to increase the long-term profit and to ensure positive cash flow from the operating activities, as well as it has set tasks related to public participation and collaboration in managing forests; to provide nature and recreation services from

the forest eco-system. One of the sub-goals is development and maintenance of the infrastructure, i.e. building, repairing and maintaining forest roads (cleaning ditches, removing bushes).

JSC „LATVIA'S STATE FORESTS” manages the state-owned land in the amount of 1.62 million hectares, including 1.60 million hectares of forest land, out of which 1.39 million hectares are covered by forests (Latvian State Forests Forest..., 2018). LSF has the rights of possession based on: part 2 of Article 4 of Law on Forest, which provides that management and protection of the forest land written in the Land Register under the name of the country in the person of the Ministry of Agriculture and within the jurisdiction of the country and possessed by the country is performed by JSC „LATVIA'S STATE FORESTS” which has been established for governing and managing the state owned forest property (Law on Forest, 2000). The amount of wood output for the main cutting is determined by the order of the Cabinet of Ministers „On the maximum allowed volume for cutting trees” (2015), which is determined every five years. The currently actual period of the order is 2016-2020.

The company uses the stock of mineral resources it possesses for the construction of forest roads. Since 2002, JSC „LATVIA'S STATE FORESTS” has built approximately 5.6 thous. km of forest roads (FR) and in January 2018 the total length of FR reached 11.8 thous. km, 2.5 thous. of which are classified as no-surface roads (they cannot be used all year round, but just for a limited period of time). The total density of FR in the forests managed by JSC „LATVIA'S STATE FORESTS” is 1.06 km per 100 ha of a commercially usable forest (Latvia's State forests, 2018). To build FR the non-renewable mineral resources of Latvia – sand, gravel, dolomite splinters – are used. JSC „LATVIA'S STATE FORESTS” extracts mineral resources: sand (S), sand and gravel (SG), sand, sand-gravel (SGS) (Seglins, V., 2007; Kurss, V., Stikule, A., 1997). The extraction of mineral resources takes place in all planning regions of Latvia: Latgale planning region (LPR); Vidzeme planning region (VPR); Riga planning region (RPR); Zemgale planning region (ZPR) and Kurzeme planning region (KPR). Extraction and use of mineral resources is linked with the building and maintenance of the forest road infrastructure, as well as selling to other interested persons (physical and legal). According to the available statistics, every year JSC „LATVIA'S STATE FORESTS” builds or reconstructs on average 318.3 km of forest roads (the average indicator in 2009 – 2017). Forest roads significantly ease managing of forest territories (preparing felling areas, cutting forests, transporting timber out of forests, planting and tending forests) and public availability of forests, develop new crossings of the traffic infrastructure in rural territories.



Source: authors' created, based on JSC „LATVIA'S STATE FORESTS" and LEGMC databases

Fig. 2. **The growth rate of JSC „LATVIA'S STATE FORESTS" profit after taxes and the base of extraction of mineral resources in 2005 – 2017, %**

Comparing the growth rate of JSC „LATVIA'S STATE FORESTS" profit (after taxes) and the base extraction of mineral resources (base year 2015), it can be observed that the period of economic recession marks a new trend in resource extraction in the company: irrespective of the profit, the extraction of mineral resources is stable (see Figure 2).

The extraction and use of mineral resources for building, repairing and maintaining forest roads is the company's investment in the future, and it also eases the management and surveying of forest territories and the output of the forests. Evaluating the comparative indicators, it can be established that starting with 2010, the extraction of mineral resources is not closely linked with other economic indicators, that is extraction and use of resources do not affect directly the company's operations and the end result – obtaining profit.

A significant criterion in production of mineral resources is extraction of explored mineral resources, which is a guarantee that the acquired resources correspond to the needs of the company, to attaining particular goals. As provided by the Regulations of the Cabinet of Ministers (CM) „Procedure for extraction of mineral resources" (2006), mineral resources are divided into three categories. Licences for extraction are issued to extract „A" and „N" category mineral resources. To mine „P" category mineral resources, licences are not issued (see Table 2).

Table 2

Categories of the stock of mineral resources

Categories	Category characteristics
A category	Explored stock of mineral resources.
N category	Evaluated stock of mineral resources. <i>The borders of the stock of mineral resources, the deposit volume and structure are determined applying insufficient geological and geophysical data which have been obtained searching for the resources or due to insufficient geological exploration. The characteristics and quality of mineral resources, as well as the engineering geological and hydrogeological conditions can be characterised by analogy with the explored deposits found in the neighbourhood.</i>
P category	Forecasted mineral resources. <i>This category is assigned to mineral resources which are calculated based on the results of geological mapping, search for mineral resources and other geological research, as well as because in territories with favourable geological circumstances the stock of the respective mineral resource acknowledged for genesis can be evaluated by analogy with other explored deposits of the same genesis.</i>

Source: authors' created, based on the Regulations of the CM „Procedure for extraction of mineral resources"

The licence for extraction of mineral resources is issued to use „A" and „N" category stock, but extraction of „N" category mineral resources does not provide any guarantees that the use of resources is rational and serves its purposes. The data obtained from the evaluation of the extraction of JSC „LATVIA'S STATE FORESTS" mineral resources by categories and the planning regions are summarized in Table 3.

During thirteen years, the best extraction results are in RPR and VPR, the worst – in KPR because every year those mineral resources are extracted that have not been sufficiently explored and whose real value, actual stock and other geological criteria have not been clarified.

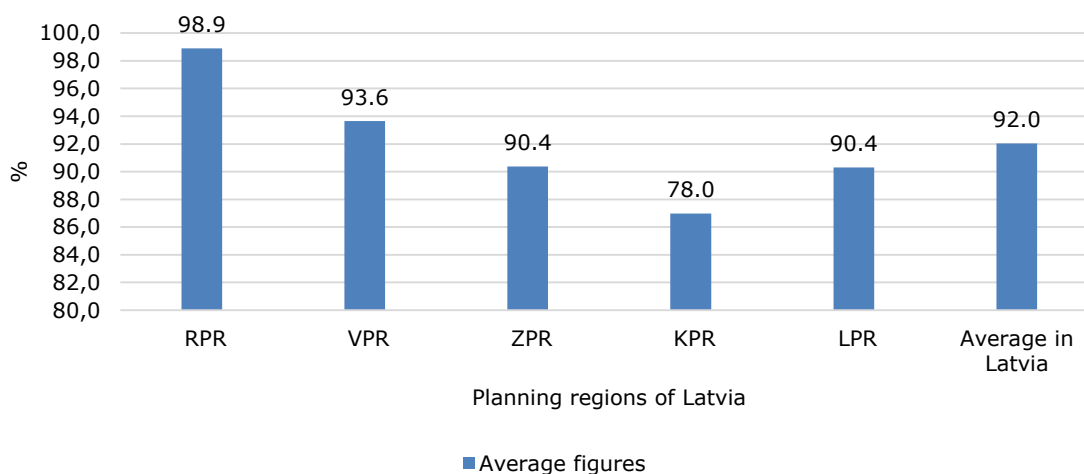
Table 3

Indications of the extraction of A category mineral resources against the total extraction in JSC „LATVIA'S STATE FORESTS” in 2005 – 2017, %

Indicators	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RPR	93.7	100.0	100.0	100.0	92.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
VPR	100.0	96.5	100.0	100.0	100.0	100.0	100.0	100.0	87.3	99.3	99.1	75.2	59.8
ZPR	69.7	90.4	72.6	95.4	98.3	98.5	99.0	94.5	99.5	85.4	94.3	87.8	89.3
KPR	99.8	95.1	86.1	94.6	91.1	98.3	100.0	99.8	98.6	67.9	76.3	82.4	40.8
LPR	68.6	86.5	76.6	96.6	91.0	96.8	90.1	95.1	99.6	91.8	84.2	100.0	97.4

Source: authors' designed based on the LEGMC database

Evaluating the average indicators of the extraction of mineral resources during the thirteen-year period, the indicators of JSC „LATVIA'S STATE FORESTS” are better than those of other extractors of mineral resources in Latvia (Lazdins A., 2016). The calculated average indicator of the extraction of „A” category mineral resources against the total of mineral resources extracted in the company is 92 %. In 2017 there appear very low extraction indicators for „A” category mineral resources in VPR and KPR because the mineral resources are extracted from new, partly explored extraction sites, as it can be seen in Table 3. Such an activity is legal, but it is not sustainable and does not correspond to the sustainability strategy of the European Union, nor the one of Latvia.



Source: authors' designed based on the LEGMC database

Fig. 3. Extraction of „A” category mineral resources in JSC „LATVIA'S STATE FORESTS” against the total extraction of mineral resources in 2005 – 2017, %

The best quality indicator for the extraction of mineral resources is in RPR, which is 98.9 %, but the worst one is in KPR - 78.0 % (see Figure 3). Comparing the average indicator of extracting „A” category mineral resources in Latvia with the extraction of „A” category mineral resources by JSC „LATVIA'S STATE FORESTS”, the indicators are worse in three regions - ZPR, KPR and LPR - 90.4 %, 78.0 % and 90.3 % respectively.

Conclusions, proposals, recommendations

- 1) Sustainability of mineral resources is linked with governing the reciprocity of economic, environmental and social processes, in which economic interests are to be made compatible with diverse processes.

- 2) Sustainable management of mineral resources needs to be related to the notions of ecology and circular economy, in which an opinion exists that depletion of natural resources by itself undermines the economic growth and determines the need for the most efficient ways of using natural resources in business so that maintaining nature systems could support human life and welfare also in the future.
- 3) JSC „LATVIA'S STATE FORESTS” is one of the largest extractors and users of mineral resources in Latvia. Especially a lot of these resources are used in building, repairing and maintaining the infrastructure of forest roads.
- 4) In JSC „LATVIA'S STATE FORESTS” the extraction and use of mineral resources is not directly linked with the goals of production increase and economic growth but indicate to the sustainability of managing and surveying forests.
- 5) The performed calculations about the quality indicators of the extraction of mineral resources approve that 92.0 % of these resources correspond to „A” category mineral resources which have been explored and approve the technical opportunities of their use.
- 6) In case of JSC „LATVIA'S STATE FORESTS” the problem is related to the places where mineral resources are extracted – on average 8 % of the extracted mineral resources are obtained from new, partly explored deposits. Such an activity is legal, but it is not sustainable and does not correspond to the sustainability strategy of the European Union, nor the one of Latvia.
- 7) The research hypothesis is only partly validated – when building the forest infrastructure, JSC „LATVIA'S STATE FORESTS” partially implements sustainable management of mineral resources.
- 8) The recommendation to improve the situation is: for JSC „LATVIA'S STATE FORESTS” quality indicators of the extraction of „A” category mineral resources to achieve 100.0 %, the principles of sustainable management of mineral resources need to be included in the strategic goals of the company and implemented in real life to become the leading carrier of the idea of sustainable management of mineral resources in Latvia.

Bibliography

1. Brown, B., Hanson, M., Liverman, D., Meredith, R. (1987). Global Sustainability: Toward Definition. *Environmental Management* 11 (6).
2. Darbibas parskati 2005 – 2017 gads (2019) (Activity reports 2005-2007). Retrieved: <https://www.lvm.lv/par-mums/skaitli-un-finanses/finanses>. Access: 10.01.2019.
3. Derigo izraktenu (buvmaterialu izejvielu, kudras un dziedniecisko dunu) krajumu bilance par 2005. – 2017. gadu (Balance of stocks of mineral resources (raw materials, peat and healing sludge) 2005-2017) (2019). Retrieved: <https://www.meteo.lv/lapas/geologija/derigo-izraktenu-atradnu-registrs/derigo-izraktenu-krajumu-bilance/derigo-izraktenu-krajumu-bilance?id=1472&nid=659> pdf. Access: 10.01.2019.
4. Derigo izraktenu ieguves kartiba (Procedures for the extraction of mineral resources) (2012). MK noteikumi Nr. 570. Retrieved: <https://likumi.lv/doc.php?id=251021> Access: 05.01.2019.
5. European Commission (2004). National Sustainable Development Strategies in the European Union. A first analysis by the European Commission. Commission Staff Working Document.
6. Kidd, C. (1992). The Evolution of Sustainability. *Journal of Agricultural and Environmental Ethics* 5.
7. Kurss, V., Stikule, A. (1997). Latvijas derigie izrakteni (Latvian mineral resources). Riga: LU. 200 lpp.
8. Latvian Environment, Geology and Meteorology Centre (LEGMC). Retrieved: <https://www.meteo.lv/en/lapas/about-centre?&id=1473>. Access: 10.01.2019.
9. Latvijas valsts meži. Meža apsaimniekosanas plans 2018. - 2022. gadam (Latvian State Forests Forest Management Plan 2018- 2022) (2018). Publiskā daļa. Retrieved: https://www.lvm.lv/images/lvm/sabiedriba/i/meza_apsaimniekosana/meza-apsaimniekosanas-plana-publiska-dala.pdf. Access: 10.01.2019.
10. Lazdins, A. (2016). *Development of mineral resource market in Latvian's regions (Summary of the Doctoral Thesis for the Degree Dr.oec.)*. Jelgava. 117 pp.
11. Meža likums (Law on Forests) (2000). LR likums: saeimā pienemts 24.02.2000. Retrieved: <https://likumi.lv/doc.php?id=2825>. Access: 10.01.2019.

12. Par ietekmes uz vidi novertejumu (On Environmental Impact Assessment). LR likums: saeima pienemts 14.10.1998. Retrieved: <https://likumi.lv/doc.php?id=51522>. Access: 10.01.2019.
13. Par koku cirsanas maksimali pielaujamo apjomu 2016.-2020. gadam (On tree felling ceilings for 2016-2020) (2015). MK rikojums Nr 718. Retrieved: <https://likumi.lv/ta/id/277848-par-koku-cirsanas-maksimali-pielaujamo-apjomu-2016-2020-gadam>.
14. Par zemes dzilem (Law on Subterranean Depths). LR likums, saeima pienemts: 02.05.1996. Retrieved: <https://likumi.lv/doc.php?id=40249>. Access: 10.01.2019.
15. Portney, K. (2015). Sustainability. Cambridge, Massachusetts: The MIT Press.
16. Robinson, J., George, F., Russel, L., Lerner, S. (1990). Defining a Sustainable Society: Values, Principles, and Definitions. Alternatives 17 (2).
17. Roosa, S. (2010). Sustainable Development Handbook (Vol. 2nd ed). Lilburn, GA: Fairmont Press.
18. Seglins, V. (2007). *Zemes dzilu resursi (Resources of subterranean depths)*. Riga: Izdevnieciba RaKa. 380 lpp.
19. Sustainable Development Strategy of Latvia until 2030 (2010). Retrieved: www.varam.gov.lv/in_site/tools/download.php?file...2030...en. Access: 10.01.2019.
20. The Brundtland Report „Our Common Future”. (1987). Report of the World Commission on Environment and Development: Our Common Future. Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment. Retrieved: <http://www.un-documents.net/ocf-02.htm#I>, Access: 10.01.2019.
21. Zemes dziles (Subterranean depths) (b.g.). VARAM. Pieejams: http://www.varam.gov.lv/lat/darbibas_veidi/zemes_dziles/. Access: 10.01.2019.

CONCENTRATION OF NON-AGRICULTURAL ECONOMIC ACTIVITY IN POLAND

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Abstract. The aim of the article is to analyse and assess the concentration of non-agricultural activities in Poland as an element of the alternative use of agricultural real estate. A detailed analysis will cover the spatial aspect of the concentration of the conducted activity. In order to determine the concentration, the location quotient (LQ) was used. The article used the current data of the Central Statistical Office regarding the characteristics of agricultural holdings in Poland in 2016. While the income from non-farm businesses conducted by farmers reached 15.2 % of farms' total income on average for whole Poland, certain diversity can be seen among provinces. It is worth emphasising that for as many as 49.2 % of agricultural holdings conducting non-farm businesses, the revenues derived from such economic activity make up more than 50 % of the total income. In particular regions, however, the share of such farms was varied, yet remaining on a relatively high level, i.e. between nearly 40 % to 58.2 %, in all the country. The significantly greater diversity of the economically largest farms was not accompanied by greater differences in the concentration of farms gaining income from non-agricultural businesses.

Key words: non-agricultural activity, farm, spatial concentration, location coefficient, Poland.

JEL code: O13, Q12, Q15.

Introduction

The research accomplished in the late 1990s implicates that the non-agricultural economic activity in rural areas in Poland had been developing very unevenly. The economic entities of a non-agricultural type were most densely concentrated in the western provinces. The weakest saturation with such businesses appeared along the eastern border of the country (Banski, 2004). The analysis of non-farm business activities at private farms made by Kolodziejczyk (2004) also demonstrated quite a large diversity in the scale of such enterprises. This was mostly due to the differences in personality traits among farm owners and in the technological supplies of farms. However, the expected vector of the dependence between the growth of non-agricultural functions and the level of infrastructure and economic potential of agricultural holdings was not confirmed by Czapiewski (2004).

The outcome of the current investigations also testifies to large spatial differentiation among farms which pursue non-agricultural economic activity. As noted by Czudec and Zajac (2017), the biggest discrepancies appear among organic farms, while farms with an additional non-agricultural business, including agritourism farms, are less diverse in this regard, and farms which sell their products directly to consumers are the least varied.

The research conducted worldwide can shed light on discrepancies between regions in terms of non-farm economic activities carried out by farmers. For instance, Von Braun and Pandya-Lorch (1991) observe that households with strong economic standing are more likely to diversify their sources of income, as this may allow them to enhance the accumulation of capital.

Reardon and co-authors (2000) underline that poorer households have a lesser chance to overcome entry barriers and therefore limit themselves to undertaking such activities that do not generate high profits. The widely implemented programmes aiming to create employment outside agriculture and start microbusinesses do not necessarily solve the problem of unequal incomes in

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rural areas, nor do they automatically provide the poorest households with benefits. Conversely, they can cause societal tensions. In current policy, it is therefore essential to draw attention to the access of less affluent households to the resources that will enable them to overcome entry barriers and break into the market outside farming.

The mechanism behind the diversification of revenue sources dependent on the availability of assets is repeatable and generates a feedback effect. Households with a better economic status accumulate assets, which are the basis for further profitable diversification. On the other hand, poorer households operate in the same sectors, with a low level of capital return, which adds to the overall increase in inequalities (Barrett et al., 2001).

The development of non-agricultural activity gives rise to the emergence of alternative sources of income, beside farming, which support all households. As emphasised by Banski (2004), this happens even in areas where agriculture is characterised by a high level of development and provides farmers with satisfactory revenues. However, there are areas that require particularly rapid changes in the functional structure because agriculture alone secures ever diminishing earnings and provides farmers and their families with the subsistence minimum.

Weltin and co-authors (2017) highlight the fact that various forms of income diversification are a manifestation of important strategies implemented by farmers. The aim is to respond to the changing economic environment. A decision to diversify business activities on or outside a farm will depend, to a large extent, on the type of farming and other characteristics of a particular farm. As implicated by the up-to-date studies, young farmers on organic farms are most likely to target at diversification. A diversification strategy is the least frequently pursued on intensive, large-scale farms, and on farms with varied agricultural production or by households which obtain only some of the income from farming. The research results also showed that while facing the prospect of hypothetically terminated subsidies from the Common Agricultural Policy (CAP) more and more farmers might employ the strategy of diversification of revenues, mostly outside agriculture, in order to survive.

As suggested by BIRTHAL and co-authors (2014), there is a wide range of push and pull factors concerning the non-agricultural activities undertaken by farmers. A small acreage of a farm (Kisiel, Jarzebowicz, 2017, Krakowiak-Bal, 2009), low income and surplus labour force available on a farm are the conditions which push the farm outside of the agricultural sector (Zmija, 2018). The level of education and the access to credit facilitate the shift to a non-farm sector of economy.

In some countries, non-farm economy functions as an alternative to agriculture rather than a supplementary business activity (Canagarajah et al., 2001). A question arises which of the following factors plays a more significant role in developing non-farm businesses: inadequate incomes and a need to secure alternative sources of revenue, or a wish to employ the farm's potential in order to develop a non-farm business and to focus on the latter? A non-agricultural activity often requires specific investment means, which underdeveloped farms usually lack. On the other hand, such farms feel a stronger urge to search for alternative sources of income. A combination of push and pull factors can determine the spatial concentration of non-farm businesses in rural areas.

The aim of the research has been to analyse and assess the concentration of non-agricultural activities in Poland as an element of the alternative acquisition of income sources. A detailed analysis covered the spatial aspect of the conducted activities. The location quotient (LQ) served to determine the concentration. Values of this quotient provide data serving to assess the level of concentration of the analysed factor. The threshold value of LQ is assumed to be 1.00. What this means is that if an LQ equals 1.00, the concentration of non-agricultural activities run by farmers in a given area is

the same as the average concentration of non-farm economy in the whole country. In our study, the LQ values were derived from the equation:

$$LQ_i = \frac{NP_{WOJ(i)} / NG_{WOJ(i)}}{NP_{PL} / NG_{PL}} \quad (1)$$

where:

LQ_i – location quotient of non-agricultural activities in the *i*th province of Poland, where

i ∈ {1,..., 16}, relative to the number of farms in the *i*th province,

NP_{WOJ(i)} – number of farms conducting non-agricultural activities in the *i*th province,

NG_{WOJ(i)} – number of farms in the *i*th province,

NP_{PL} – number of farms conducting non-agricultural activities in Poland,

NG_{PL} – number of farms in Poland.

To assess the degree of concentration, the following intervals for the LQ values were adopted:

- an LQ value >1 means higher concentration of the analysed characteristic than on average in Poland;
- an LQ value <1 means a potential deficit in the analysed characteristic;
- an LQ value = 1 (± 0.15) means that the distribution of the analysed variable runs a similar course as the distribution of this variable in the reference area.

A preliminary analysis and evaluation of the non-agricultural activity on farms as found in the Polish provinces were made, and the results were used to calculate the concentration coefficients.

The following were included:

- regional differentiation of farms which earn income from non-agricultural activity,
- share of farms which earn income from non- agricultural activity in the total number of family farms in particular provinces,
- share of households where over 50 % of total revenue originated from non-agricultural activity in the total number of farmers' households that earn income from non-farm business,
- share of the economically smallest farms (>100 thousand euro).

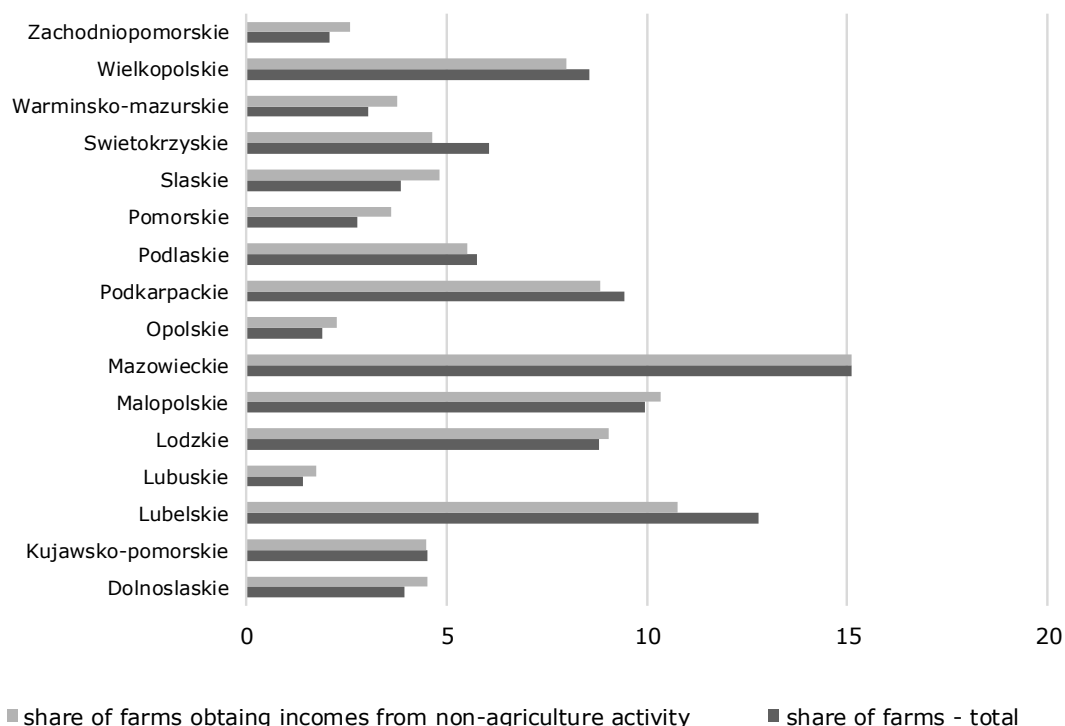
The subsequent stage of the study consisted of calculating the location quotient for the economically largest farms (>100 thousand euro), farms earning income from non-agricultural activity, and farms conducting non-agricultural activity where over 50 % of total income originated from non-agricultural activity.

The authors based their research on current and available data for 2016 of the Polish Central Statistical Office (CSO), regarding the statistics of farms in Poland.

Research results and discussion

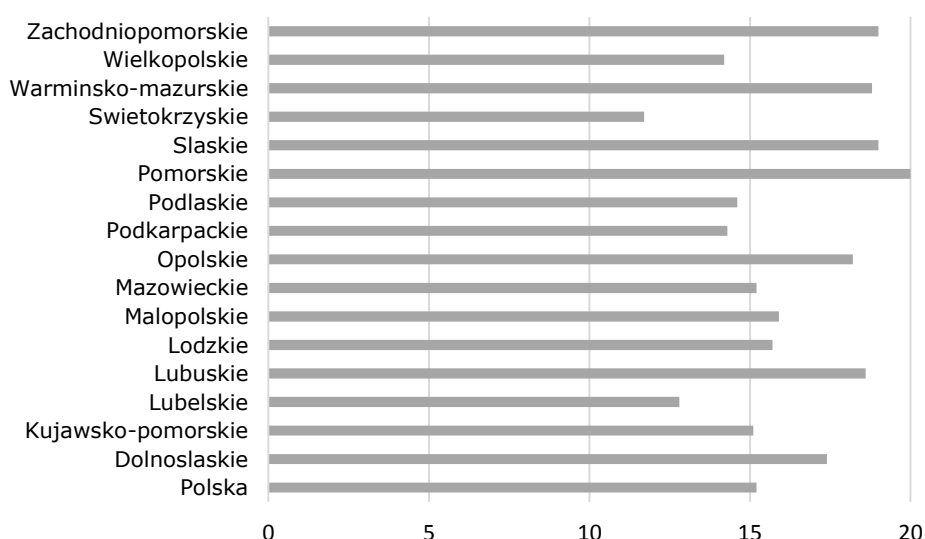
The Polish provinces are distinctly varied in terms of the share of farms obtaining some income from non-agriculture activity in the total number of this group of farms in Poland. In Lubuskie Province, for example, this percentage equalled 1.7 %, while in the Province of Masovia it was as high as 15.1 % (fig. 1). In two provinces the percentage of such farms was close in value to the share of farms in the same region in the total number of farms in Poland. In nine other provinces, the share of farms earning income from non-agricultural activity was higher than the share of farms in a given province in the total number of farms in Poland, although the difference did not exceed 1 per cent point. In five provinces, the share of farms earning some revenue from non-farm economic activity was lower than the share of farms in each of these provinces in the total number of Polish farms. Attention can be drawn to the situation in the Province of Lublin, where the greatest

discrepancy between the values of these two statistical measures was seen. It can therefore be said that one of the factors which largely determine the share of agricultural households in a given region in the total number of such households earning the income from non-agricultural activities is the total number of farms in the said region.



Source: author's calculation based on CSO data

Fig. 1. Regional diversification of total number of farms and farms obtaining incomes from non-agriculture activity (%)



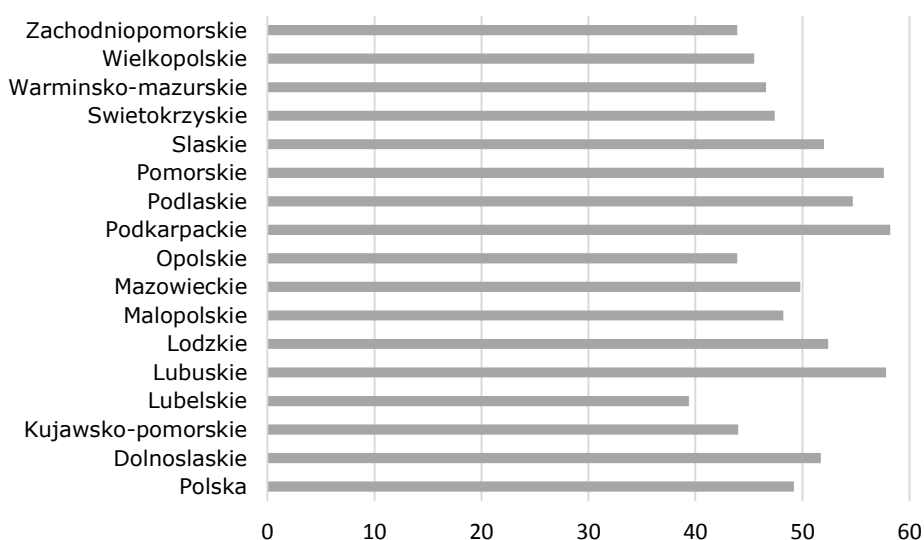
Source: author's calculation based on CSO data

Fig. 2. Share of farms obtaining incomes from non-agriculture activity in total number of farms in each region (%)

It was demonstrated that the percentage of farms earning income from non-agricultural activities in the Polish provinces deviated, to a different extent among the regions, from the share of farms in a province in the total number of farms in Poland, which led to the next step in the research, namely

an analysis of the level of concentration of non-farm economy in each province. Thus, it was calculated what percentage of farms out of all farms in each province earned income from non-agricultural activity. As demonstrated by the data (fig. 2), revenue from non-farm economy is derived by an average of 15.2 % of farms in whole Poland. A percentage higher than that was calculated for 9 provinces, of which the Province of Pomerania scored the highest (20.0 %). In 6 provinces, the percentage of such farms was lower than the Polish average, with the lowest figure (11.7 %) calculated for the Province of Swietokrzyskie.

The role of farming in the diversification of income sources can be demonstrated not only through the share of farms earning revenues from non-farm businesses but also by the share of such earnings in the total income of a farm. As shown by the data in figure 3, in the total number of farms obtaining some income from non-farm economic activities in Poland (214 447 farms), nearly half (49.2 %) made up over 50 % of the total earnings from non-farm economy. This measure varied in value among the Polish provinces, but always remained relatively high. In the province with the lowest share of farms whose income from non-farm business activities reached over 50 % of the total income, the contribution of this income to the total earnings was 40 %. In the Province of Podkarpacie, it was as high as 58.2 %.



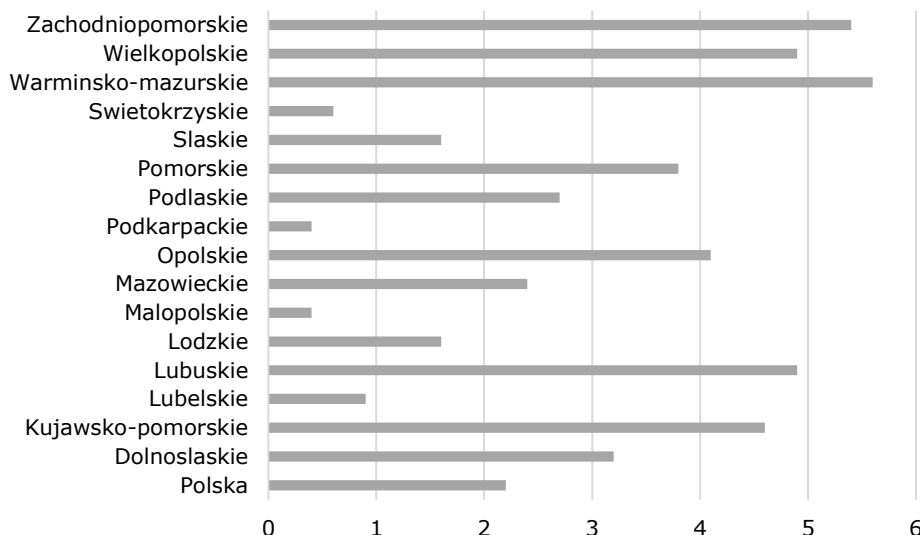
Source: author's calculation based on CSO data

Fig. 3. Share of households whose more than 50 % of incomes are incomes from non-agricultural activity in total number of farms obtaining incomes from non-agricultural activity - %

In an attempt to answer the resolve whether a decision to undertake a non-farm business activity arises from a strategy assuming an alternative use of an agricultural real estate property or is a way to achieve diversification of income sources, the authors determined the concentration of farms which were economically the largest. It was agreed that these are the farms with the standard production output of more than 100,000 Euro.

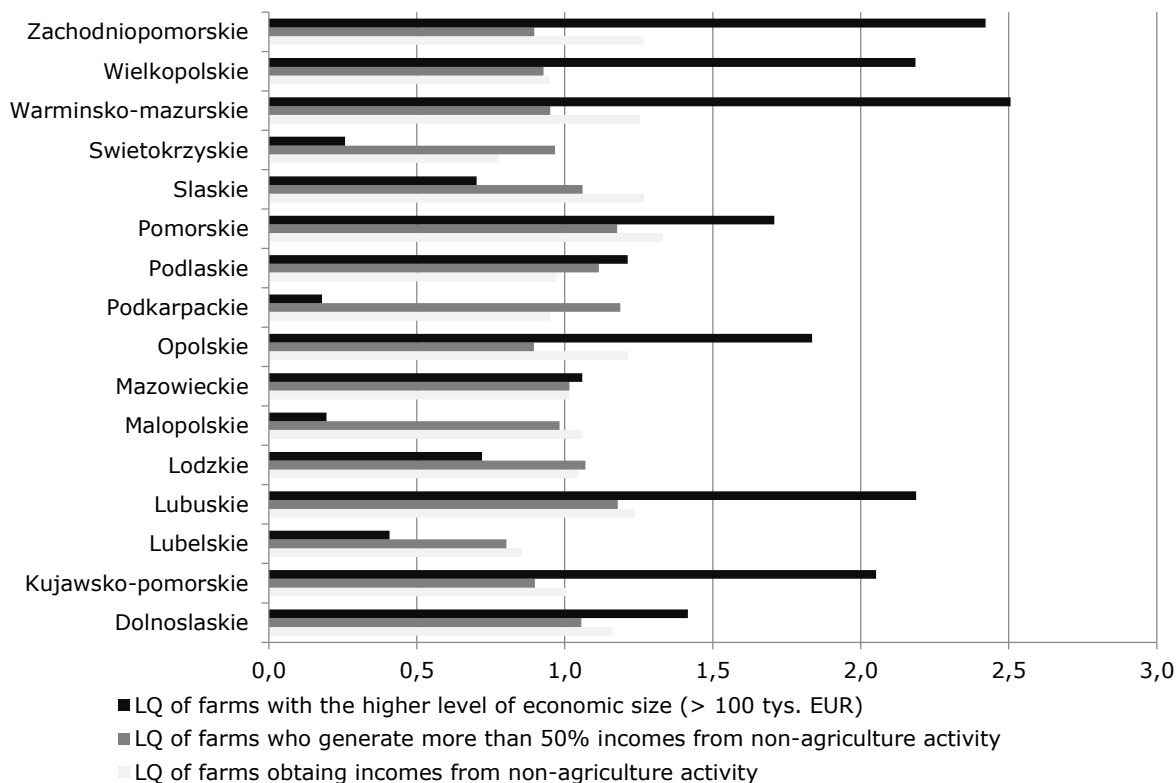
The data (fig. 4) prove that the highest share of economically the largest farms can be found in the provinces which at the onset of the social and economic transformation in Poland had the highest share of state-owned farmland. They were the following provinces: warminsko-mazurskie (5.6 %), zachodniopomorskie (5.4 %), as well as wielkopolskie (4.9 %) and lubuskie (4.9 %). On the other hand, the percentage of state-owned farmland in the provinces podkarpackie and malopolskie did not exceed 0.4 % at that time.

It can therefore be noticed that the intraregional differentiation among the farms earning revenues from non-farm economy and among the economically largest farms is similar when measured on the scale of the whole country. This similarity is confirmed by the differences being equal No more than a few per cent points between the province with the largest and the one with the smallest share of the two groups of farms mentioned above.



Source: author's calculation based on CSO data

Fig. 4. Share of farms with the highest level of economic size (>100,000 EUR) - %



Source: author's calculation based on CSO data

Fig. 5. Regional diversification of LQ in chosen farms group

The analyses of the concentration of non-farm economic activities and farms obtaining income from non-farm businesses (where such income corresponded to over 50 % of the total income), as

well as the concentration of farms which are economically the largest allowed us to calculate the synthetic index of the concentration of farms within the analysed categories.

The data presented in this paper prove that there are differences among the Polish provinces in the concentration of all the analysed categories of farms. Considering the farms which earn income from non-farm businesses, the concentration index was higher than the reference one in 7 provinces, where it ranged from 1.16 to 1.33. It was only in one province (swietokrzyskie) that the value of the concentration index (0.78) was lower than calculated for the reference area. In 8 provinces, on the other hand, the concentration of the farms which acquired income from non-farm economy was similar to that calculated from the whole country.

With regard to farms which conduct non-farm businesses where over 50 % of the total income was composed of the revenues gained from non-farm economy, differences in their concentration between individual provinces were smaller. Of the 16 Polish provinces, the value of the concentration index was higher than in the references area in just 3 provinces (pomorskie, podkarpackie, lubuskie), being lower in one province (lubelskie). Thus, in as many as 12 provinces, the concentration of farms conducting non-farm economic activity and earning a high level of revenues (compared to their total income) was similar to the average value computed for Poland.

When referring the results of the analysis presented above to the variation in the index of concentration of economically the largest farms, also discussed in this article, it can be observed that the much higher diversity among the latter agricultural holdings does not coincide with greater differences in the concentration of farms earning income from non-farm economy. Nonetheless, 5 out of the 8 provinces with the concentration of economically the largest farms above the average were noted to attain the value of the concentration index of farms earning income from non-farm businesses above the reference value.

Conclusions

- 1) The analyses performed in this study have demonstrated that the share of farms in a given province in the total number of farms earning income from non-farm economic activities is in general convergent with the share of farms in the given province in the total number of farms in Poland. Except one province, differences in these percentages did not exceed 1 per cent point.
- 2) While the income from non-farm businesses conducted by farmers reached 15.2 % of farms' total income on average for whole Poland, certain diversity can be seen among provinces. Higher values were noted in 9 provinces, of which the highest share (20.0 %) was recorded in the Province of Pomerania. In 6 provinces, this percentage was less than the country's average, being the lowest (11.7 %) in the Province of Swietokrzyskie.
- 3) It is worth emphasising that for as many as 49.2 % of agricultural holdings conducting non-farm businesses, the revenues derived from such economic activity make up more than 50 % of the total income. In particular regions, however, the share of such farms was varied, yet remaining on a relatively high level, i.e. between nearly 40 % to 58.2 %, in all the country.
- 4) Differences in the concentration of all analysed categories of farms were noticed among the provinces in Poland. At the same time, for the group of farms conducting non-farm business activities where the income from such activities accounted for over 50 % of total revenue, the variation of the concentration index was lower than for all farms generating revenues from non-agricultural activities.

- 5) It was also found that the significantly greater diversity of the economically largest farms was not accompanied by greater differences in the concentration of farms gaining income from non-agricultural businesses.

Bibliography

1. Banski, J. (2004). Możliwości rozwoju alternatywnych źródeł dochodu na obszarach wiejskich (Opportunities for developing alternative sources of income in rural areas). In: Pałka E. (ed.) *Pozarolnicza działalność gospodarcza na obszarach wiejskich*. Studia Obszarów Wiejskich, Warszawa, t. V, pp. 9-22.
2. Barrett, C. B., Reardon, T., Webb, P., (2001). Nonfarm Income Diversification and Household Livelihood Strategies in Rural Africa: Concepts, Dynamics, and Policy Implications. *Food Policy*, No 26, pp. 315-331.
3. BIRTHAL, P.S., NEGIA, D.S., JHAB, A.K., SINGH, D. (2014). Income Sources of Farm Households in India: Determinants, Distributional Consequences and Policy Implications. *Agricultural Economics Research Review*, Volume 27, No 1, pp. 37-48.
4. Canagarajah, S., Newman, C., Bhattamishra, R. (2001). Non-farm Income, Gender, and Inequality: Evidence From Rural Ghana and Uganda. *Food Policy*, No 26 (4), pp. 405-420.
5. Charakterystyka gospodarstw w Polsce w 2016 r. (Characteristic of farms in Poland in 2016). (2017). GUS, Warszawa.
6. Czapiewski, K. (2004). Wyposażenie infrastrukturalne i potencjał gospodarczy obszarów wiejskich a pozarolnicze funkcje gmin (Infrastructure and economic potential of rural areas and non-agricultural functions of municipalities). In: Pałka E. (ed.) *Pozarolnicza działalność gospodarcza na obszarach wiejskich*. Studia Obszarów Wiejskich, Warszawa, t. V, s. 57-74.
7. Czudec A., Zajac, D. (2017). Non-farming Entrepreneurship in the Farm Activity Diversification Process. *Journal Agribusiness Rural Development*, No 43(1), pp. 69-78.
8. Kisiel, R., Jarzebowicz, N. (2017). Non-agricultural Business Activity in the Olecko District. *Journal of Agribusiness and Rural Development*, No 4(46), pp. 787-794.
9. Kolodziejczyk, D. (2004). Pozarolnicza działalność gospodarcza w indywidualnych gospodarstwach rolnych w skali gmin (Non-agricultural activity in individual farms in the scale of communes). In: Pałka E. (ed.) *Pozarolnicza działalność gospodarcza na obszarach wiejskich*. Studia Obszarów Wiejskich, Warszawa, Volume V, pp. 23-34.
10. Krakowiak-Bal, A. (2009). Pozarolnicza działalność gospodarcza polskich gospodarstw rolniczych na tle gospodarstw z krajów UE (Other gainful activity in agricultural holdings in Poland and EU countries). *Infrastruktura i Ekologia Terenów Wiejskich. Polska Akademia Nauk, Oddział w Krakowie, Komisja Technicznej Infrastruktury Wsi*, No 5/2009, pp. 209-217.
11. Reardon T., Taylor J.E., Stamoulis K., Lanjouw P., Balisacan A. (2000). Effects of Nonfarm Employment on Rural Income Inequality in Developing Countries: an Investment Perspective. *J. Agric. Econ.*, No 51 (2), pp. 266-288.
12. Von Braun, J., Pandya-Lorch, R. (1991). *Income Sources of Malnourished People in Rural Areas: Microlevel Information and Policy Implications*. International Food Policy Research Institute (IFPRI).
13. Weltin, M., Zasada, I., Franke, Ch., Piorra, A., Raggi, M., Viaggi, D. (2017). Analysing Behavioural Differences of Farm Households: An Example of Income Diversification Strategies Based on European Farm Survey Data. *Land Use Policy*, No 62 (2017), pp. 172-184.
14. Zmija, K. (2018). Determinanty i perspektywy prowadzenia działalności rolniczej w małych gospodarstwach rolnych z pozarolniczą działalnością gospodarczą (Determinants and Prospects of Conducting Agricultural Activities in Small Farms with Non-Agricultural Activities). *Problemy Rolnictwa Światowego*, Volume 18, Issue 2, pp. 342-352.

IMPORTANCE OF MEASURES TAKEN BY LOCAL AUTHORITIES FOR DEVELOPMENT OF ENTREPRENEURSHIP – A CASE STUDY OF RURAL MUNICIPALITIES IN POLAND

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Abstract. The research objective has been to identify activities undertaken by authorities of rural municipalities with the aim of creating a friendly economic and social environment to establish and develop business enterprises. The research was chiefly based on an analysis of primary data collected with the help of a questionnaire designed by the authors, at the turn of 2015/2016. The survey was addressed to mayors of all rural municipalities in Poland (1565 administrative units in Poland). Fully and correctly completed surveys were returned by 770 respondents, which corresponded to a return rate equal 49.2 % (the error of answers from the sample obtained was 3 %). The research objective was achieved by verifying the hypothesis assuming that authorities from rural municipalities where the increase in the number of enterprises between 2009 and 2018 was the highest were more active creating proper conditions for starting and conducting business. Our analysis of the collected empirical material provided evidence that confirmed the above assumption. The study shows that the authorities of municipalities where there was a high rise in the number of business companies between 2009 and 2018 much more often entered into collaboration with other subjects in order to create an optimal environment for conducting business, were more willing to take measures to increase the participation of entrepreneurs in the creation of suitable conditions for the development of business, and formed more positive assessment of the achieved outcomes.

Key words: entrepreneurship, local development, municipality.

JEL code: R10.

Introduction

Entrepreneurship is a multi-dimensional phenomenon, shaped by social and economic conditions. Entrepreneurship can be treated as an attitude or as a process. Being an attitude, entrepreneurship corresponds to a trait in human nature, and stands for the readiness to face new challenges, to improve the existing components of the human environment, and to take an active and creative stance towards one's surroundings. In turn, entrepreneurship understood as a process means the creation and development of a business entity (enterprise) (Babuchowska K., Marks-Bielska R., 2013; Feher A. et al., 2014). Rural entrepreneurship is acknowledged to be an important contributor to the economic development of a country (Holcombe R., G., 1998; Ahmad et al., 2011; Feher A. et al., 2014).

Business activity in rural areas in its fundamental aspects occurs in the same forms as in towns. However, the circumstances in which it is conducted are different, often more difficult than in urban centres. The experience gained by many countries implicates that local authorities can play a very important role in the stimulation of entrepreneurship. Each municipality possesses specific economic potential and a certain number of enterprising persons who can activate this potential if offered suitable conditions. To a large extent, this depends on local authorities. It is important that they act efficiently, so as to employ the local resources and create a good climate for conducting business in the administrative unit they govern. The range of problems local governments are faced with is enormous, but there are more and more municipalities able to overcome difficulties (Kłodzinski M., 2015).

Actions undertaken by local governments can become a significant determinant of the level of entrepreneurial activity. Decisions which they make can stimulate the establishment of new

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companies. Municipal authorities can directly regulate operations conducted by business entities on the local market (for example, by passing resolutions or decisions, by accepting spatial management studies and plans), and they can actively participate in business (e.g. by conducting economic activity, making investments or selling own property). The indirect impact can consist of forming the environment in which businesses are conducted (e.g. tax rates, contracts, agreements).

The research completed by W. Karaszewski et al. (2016) in four provinces in Poland, among representatives of companies with a share of foreign capital and local governments, suggests that there is a constant need for local authorities to undertake more vigorous actions in order to improve the conditions for conducting business. It is important to notice and to come forward to meet the needs of existing and potential investors, willing to localise and conduct business companies in a given municipality.

For local governments to be able to influence the social and economic development of their local communities, they need to be equipped with proper instruments. These tools should be adjusted to two types of tasks. First, they should enable local authorities to identify the problems appearing in the territory of their administrative units, to analyse internal and external development conditions, and to programme the directions and methods to carry out specific operations. Secondly, the local governments need tools to implement the decisions and programmes they have prepared, through the accomplishment of their strategic goals and inclusion of social and economic subjects in their implementation (Potoczek A., 2012; Marks-Bielska R., 2017).

An approach among economists to determinants of local development and their role in the course of processes occurring in territorial units has been evolving. More and more attention is being paid to the increasing role of internal conditions. Views over what development factors are universal begin to converge. These factors are classified, for example, according to needs of residents and economic entities, resources and assets of a local environment, development and management of infrastructure, economic, technical, human resources and scientific potential, cultural and industrial traditions, activity of the local community, as well as institutional resources. Factors which exert influence on present and future possibilities of the development in a given area can be divided according to various criteria. Considering how they affect development, positive and negative factors can be distinguished. When taking into account possible localisation of companies, factors fall into 'hard' and 'soft' ones. Finally, the origin of factors can be considered giving rise to a division into external (exogenous) and internal (endogenous) circumstances.

Being able to correctly identify the economic functions of a given area, its identity and efficiency in a decision-making process will help us achieve goals established in development processes. In the formation of rural development processes, it is believed that special attention ought to be paid to local resources; another recommendation is to involve local residents (including entrepreneurs) in the process of developing their municipality. Such an approach can reinforce the factors that affect the level of competitiveness of local government units, mostly supporting entrepreneurship, creating a positive image, making the localisation of new businesses an attractive option, creating a good atmosphere for investment projects, enhancing the human capital, promoting natural values and tourism, supporting investments which serve to diversify conducted businesses, as well as building a system of institutions which respond properly to the functions they should perform.

This area calls for continuous research because the available data describing the local governments in Poland prove that these institutions still do not perform their pro-development roles satisfactorily. One immediate cause is the scale and type of transfers from the state's central

institutions. Changes which are desired would limit the state's interference with the sphere of local economy. This is manifested by limiting the role of the state as the owner of production resources, employer and investor. The indirect influence of the state on local development processes is gradually shifted towards having an indirect influence on decisions of local governments.

The objective of this study has been to identify the measures taken by authorities of rural municipalities in order to create a friendly economic and social climate for the establishment and development of business enterprises. The research consisted mainly of an analysis of primary data gathered with a questionnaire designed by the authors and mailed to potential respondents in 2015/2016. The respondents were mayors (*wójt*) of all rural municipalities (*gmina*) in Poland (1565 units constituting the third-tier local governments, i.e. the lowest level in Poland's administrative division). In total, 770 respondents returned fully and correctly completed questionnaires, which corresponded to the return rate of 49.2 % (an error of answers from the sample thus obtained equalled 3 %). A chi-square test was applied to verify whether the spatial distribution of municipalities in the achieved sample (relative to the highest administrative division into provinces) was significantly different from the distribution in the whole population. The χ^2 statistics reached a value of 7.25 ($p=0.950$), which proved the lack of statistically significant differences between the observed distribution (present in the sample) and the expected distribution (present in the population).

The research aim was attained by verifying the hypothesis stating that authorities of rural municipalities in which the highest increase in the number of business entities between 2009 and 2018 was noted would demonstrate higher activity in the field of creating suitable conditions for starting and conducting business. The indicator ΔE_i (an increase in the number of companies in a municipality between 2009 and 2018) served to identify the above group of municipalities, while the process of separation into several groups proceeded through two stages. First, the so-called outstanding cases (i.e. satisfying the condition $x_{ods} < 2.5Q_1 - 1.5Q_3$ and $x_{ods} > 2.5Q_3 - 1.5Q_1$)¹ were excluded from the group, as these were considered to represent groups with either a very high or very low intensity of the analysed trait; afterwards, the remaining municipalities were divided into three classes, according to the determined range (R) and value of the division parameter (k)². Consequently, the group of 770 municipalities was divided into four separate sets, composed of different number of units, and characterised by different intensity of the indicator ΔE_i ; group I – municipalities with extremely high (compared to the whole sample) values of ΔE_i ; group II – municipalities with high values of ΔE_i ; group III – with medium values of ΔE_i ; and group IV – with the lowest values of ΔE_i .

Research results and discussion

The analysed sample of rural municipalities showed differences in terms of an increase in the number of business enterprises between 2008 and 2018. Nearly half (48.7 %) fell into the group with the lowest values of ΔE_i , and in 25 of these the difference between the base and the final year was negative. The second most numerous group was composed of municipalities with moderate (i.e. 115 entities on average) increase in the number of business companies (33.6 %). The remaining municipalities presented either a high or a low value of the analysed indicator, and their share in the total sample was 8.7 % and 9.0 %, respectively. The basic statistics describing particular groups of

¹ Q_1 and Q_3 stand for the first and third quartile (<https://www.statystyka-zadania.pl/obserwacje-nietypoweodstajace/>, access: 9.11.2018).

² The division parameter k was determined according to the equation: $k = R/w$, where w is the number of groups (Kukuła K., 2015).

municipalities distinguished with respect to a rise in the number of companies between 2009 and 2018 are set in Table 1.

Table 1

Descriptive statistics concerning the increase in the number of companies between 2009 and 2018, according to the distinguished groups

Specification	N	\bar{x}	min	max	SD	V	S	K
Group I	69	550.19	305	2095	310.74	56.48	2.65	8.99
Group II	67	228.51	183	290	34.30	15.01	0.41	-1.21
Group III	259	115.22	76	181	29.58	25.68	0.50	-0.90
Group IV	375	39.06	-112	75	24.43	62.55	-1.00	3.03

Note: N – number of units in the group, \bar{x} – mean; min – minimum value; max – maximum value; SD – standard deviation; V – variability coefficient; S – skewness coefficient; K – coefficient of kurtosis

Source: the authors' calculations based on data from the Local Data Bank

Regardless of which group their municipality was classified into, according to this research, most respondents (92.9 %) declared supporting entrepreneurship actively, both by creating conditions conducive to setting up new businesses and by helping existing companies to conduct and develop their business activity. The support given to entrepreneurs willing to start business consisted mostly of a pro-active approach of officials and local communities (19.8 % of total answers), and it was more often observed among municipalities in groups I (where this response was selected by 75.4 % of respondents) and II (88.1 %) than in groups III (71.0 %) and IV (72.3 %). Other popular instruments included: assistance in finding land parcels or premises for locating a company (13.6 % of total answers), and improved technical infrastructure in the municipality (12.9 %). Among the municipalities with a more intensive rise in the number of companies (groups I and II), the second most frequent reply referred to the assistance in finding some land or premises (this option was indicated by 58.0 % and 56.7 % of the respondents, respectively), while the third most often selected answer was the improved technical infrastructure (46.4 % – group I, 55.2 % – group II). Among the municipalities with the lower values of ΔE_i , the order in which these instruments were indicated was reverse – improvement of infrastructure was indicated by 50.2 % of the respondents in group III and 50.1 % in group IV (second place), while assistance in finding a land parcel or premises to set up a company was chosen by 45.2 % of the respondents in group III and 46.4 % in group IV (third place). A similar set of instruments was used by local authorities to support existing companies. Also here, the highest percentage of indications (20.2 %) was gained by the friendly approach of officials and local communities to entrepreneurs, with the betterment of overall infrastructure being the second most popular response (15.0 %). Differences which appeared between the groups concerned the order of actions, which was implied by the frequency of specific indications. Respondents from the municipalities where the number of companies increased between the years 2009 and 2018 the highest (group I) most often pointed to the development of technical infrastructure as a tool of support to operating companies (59.4 %), while the second most frequent answer was the friendly approach of the authorities and local communities (55.1 %). In turn, the respondents representing municipalities with the smallest increase in the number of companies over the analysed period most often pointed to the modernisation of technical infrastructure, followed by the friendly attitude of the administration and local population (55.1 %). Finally, the respondents from the municipalities where the number of companies either increased the least or even decreased in the analysed decade concentrated first on the attitude of officials and residents (58.9 %) and next on technical infrastructure (40.8 %).

Creating a climate conducive to entrepreneurial activity does not need to be the responsibility of local authorities alone. In search of a synergistic effect, they can undertake actions in collaboration with other institutions located in or outside their municipality, and engage entrepreneurs in efforts to shape conditions favourable to the growth of business.

This research shows that the local councils in most municipalities collaborated with other entities, although unfortunately such collaboration was not very common (tab. 2).

Table 2

Does your municipality collaborate with other institutions in order to create optimal conditions for conducting business? Structure of responses (%)

Specification	No	Yes, but we rarely collaborate with others	Yes, there are a few institutions with which we collaborate regularly	Yes, we have constant collaboration with a wide range of institutions
Group I	21.2	48.5	24.2	6.1
Group II	17.9	38.8	34.3	9.0
Group III	26.6	45.2	23.9	4.2
Group IV	35.8	41.2	21.4	1.6

Source: the authors' calculations based on questionnaire survey

Among the institutions engaged by local authorities in the process of creating optimal conditions for conducting business, three were most often indicated, i.e. the Starost's Office (the second-tier local government in Poland; *starostwo powiatowe*) (20.3 % of total answers), the Marshal's Office (the first-tier local government; *Urząd Marszałkowski*) (17.5 %) and other municipalities in Poland (12.2 %). Similar networks of cooperation have been built by local governments in all groups of municipalities distinguished with respect to the value of ΔE_i , and differences which appeared among them concerned only the frequency of indications. Respondents from groups I and II chose the Starost's Office and other municipalities much more often than those from groups III and IV. The percentages of indications for the former were: 56.5 % and 61.2 % (groups I and II), and 48.6 % and 49.9 % (groups III and IV), while collaboration with other municipalities was chosen by 40.6 % and 46.3 % (groups I and II) and 30.1 % and 26.4 % (groups III and IV). The Marshal's Office was most often indicated by municipalities in the group with a high rise in the value of ΔE_i (group II) (59.7 %), and least frequently in the set of municipalities with a moderate increase in ΔE_i (40.9 %).

Among the activities aiming to create optimal conditions for entrepreneurial activity which the local authorities undertook in collaboration with others, the following were indicated most often: promotion and exchange of information (22.4 % of total answers), organisation of cultural and sports events (20.4 %), implementation of projects with EU funding (18.5 %), investments into technical/social infrastructure (17.2 %) and municipal services (11.2 %). These activities were indicated in the same order (although with some differences in the frequency of indications) in all groups except the first one (Tab. 3).

As mentioned before, activities directed at the creation of a suitable climate for the development of business in a municipality should involve local entrepreneurs as well. An advantage of the inclusive approach is that undertaken activities can be adjusted to specific needs of direct recipients. Unfortunately, the survey showed that nearly ¼ of the local governments in municipalities did not take advantage of such a solution. Moreover, the percentage of municipalities which did not collaborate with business companies in this capacity was higher in the groups with lower values of the indicator ΔE_i (Tab. 4).

Table 3

Tasks performed in collaboration with others to create optimal conditions for conducting business in a municipality (in %)

Group I		Group II		Group III		Group IV	
Task	%*	task	%*	task	%*	task	%*
Promotion and exchange of information	59.4	Promotion and exchange of information	64.2	Promotion and exchange of information	52.1	Promotion and exchange of information	44.8
Infrastructural investments	50.7	Organisation of events	61.2	Organisation of events	44.0	Organisation of events	43.2
Organisation of events	50.7	Implementation of EU projects	53.7	Implementation of EU projects	41.7	Implementation of EU projects	39.2
Provision of municipal services	43.5	Infrastructural investments	49.3	Infrastructural investments	39.8	Infrastructural investments	33.6
Implementation of EU projects	42.0	Organisation of events	32.8	Organisation of events	22.4	Organisation of events	22.4

* - percent derived from the number of indications relative the number of units in the set

Source: the authors' calculations based on the questionnaire survey

Table 4

Does the municipality undertake activities to increase the participation of entrepreneurs in creating friendly environment for the development of business? Structure of answers (in %).

Specification	No	A	B	C
Group I	12.9	81.4	5.7	0.0
Group II	15.3	73.6	6.9	4.2
Group III	24.5	72.0	3.4	0.0
Group IV	27.7	70.5	1.9	0.0

A—yes, we make efforts to find out opinions of entrepreneurs and inform them about the most important activities undertaken in the municipality; **B** – yes, our collaboration with entrepreneurs is based on their regular, planned participation in tasks undertaken together with the municipality; **C** - yes, we have developed and implemented mechanisms and forms of collaboration with entrepreneurs as a formal group of advisors, which leads to their active, planned and regular participation in most tasks undertaken together with the municipality

Source: the authors' calculations based on the questionnaire survey

In the range of activities performed by local authorities with the aim of increasing the participation of entrepreneurs in the creation of friendly environment for developing business, the following came to the fore: inviting entrepreneurs to participate in sessions of the local council (23.9 % of the total indications), exchange of information on the needs of the local labour market (20.3 %), encouraging entrepreneurs to collaborate in economic and social projects (19.3 %), as well as meetings of councillors and municipal officials to discuss problems encountered by entrepreneurs (17.9 %). Our analysis of the responses according to the groups of municipalities showed a large diversity in the selected activities in all the groups, except groups III and IV, where the preferences were nearly identical, although in group IV the most frequently indicated activity was to invite entrepreneurs to sessions of the local council (41.9 %) Tab. 5).

The research was concluded by forming a subjective assessment of the activities by local authorities, performed both individually and in collaboration with other institutions or with entrepreneurs.¹ In each of the three cases (1. individual undertakings, 2. implemented in collaboration, and 3. involving entrepreneurs), most respondents were of the opinion that the

¹ Respondents assessed the effectiveness of activities on a four-point scale of preferences, where: certainly yes = 3 points, yes = 2 points, no = 1 point, certainly no = 0 points. The points served to build the indicator W ($W = (\sum n_i w_i) / kN$, where: i - index of assessment, n_i - number of indications of a given factor on the i^{th} place; k - maximum assessment on a 0 to k scale; N - number of respondents who answered the question; w_i - assessment corresponding to the place of factor i) informing what share of the maximum number of points which could be scored the respondents assigned to a given answer (Karaszewski W., Sudol S., 1997).

measures they took contributed to the creation of optimal conditions for conducting entrepreneurial activity. The highest ($W=0.59$) effectiveness was assigned to activities implemented by the local governments individually, and this evaluation emerged from both the total analysis and separated into the four groups of municipalities. Moreover, in each of the three areas of activities performed by local authorities, the value of W index was seen to decrease parallel to the decreasing value of ΔE_i . This means that respondents from the municipalities where the increase in the number of economic entities between 2009 and 2018 was high or very high assessed the achieved effects better than respondents from the municipalities classified to group IV.

Table 5

Activities undertaken by local authorities in order to increase the participation of entrepreneurs in the creation of friendly environment for the development of business (in %).

Group I		Group II		Group III		Group IV	
Task	%*	task	%*	task	%*	task	%*
Meetings with councillors and municipal officials	39.1	Collaboration in social and economic projects	52.2	Invitations to sessions of the local council	37.5	Invitations to sessions of the local council	41.9
Invitations to sessions of the local council	36.2	Invitations to sessions of the local council	49.3	Exchange of information about labour market	35.5	Exchange of information about labour market	32.0
Exchange of information about labour market	36.2	Meetings with councillors and municipal officials	43.3	Collaboration in social and economic projects	35.1	Collaboration in social and economic projects	28.0
Collaboration in social and economic projects	30.4	Exchange of information about labour market	41.8	Meetings with councillors and municipal officials	31.3	Meetings with councillors and municipal officials	25.9

* - percent derived from the number of indications relative to the total number of units in the set

Source: the authors' calculations based on the questionnaire survey

Conclusions

The social and economic environment as well as the spatial circumstances specific to rural areas are different from these which prevail in urban areas. The rural setting is in many aspects much more challenging for conducting and developing business activity.

Municipal authorities which particularly care about the development of local entrepreneurship are open to all economic initiatives, provide friendly climate and professional service to investors, and support the entrepreneurs who conduct their business in the municipality. The policy of the local authorities regarding the acquisition of investors takes into consideration these elements which their municipality comprises (either natural assets or specific solutions that have been implemented) as well as such components that can be created or improved (e.g. infrastructure, taxation policy, quality and efficiency of customer service in offices, cooperation between the authorities and investors).

Entrepreneurship can lead to an enhanced quality of life, and it can help local residents to satisfy their expectations and achieve their aspirations more completely. To a large extent, the development of entrepreneurship ensures the wealth of a local community. And as local inhabitants increase their wealth, the local governments find it easier to implement the tasks they are delegated with. Taking care of local entrepreneurship and creating suitable conditions for the development of economic activity are examples of particularly significant challenges that local authorities are expected to respond to.

This research was directed towards verifying the hypothesis assuming that local authorities in the rural municipalities where between the years 2009 and 2018 the increase in the number of business companies was the highest demonstrated higher activity in the scope of creating favourable conditions for starting and conducting business. Our analysis of the collected empirical material provided evidence which confirmed the assumed hypothesis. This was particularly evident when reviewing responses to the question about collaboration with other subjects and the one concerning increased participation of entrepreneurs in the creation of a proper climate for developing business. In both cases, the percentage of answers 'the municipality does not undertake such activities' increased considerably as the value of the index ΔE_i decreased. A similar finding emerged from our analysis of the self-assessment by local authorities of effects of undertaken activities, where a decreasing number of businesses between 2009 and 2018 was accompanied by a lower value of the index W.

Bibliography

1. Ahmad, A.R., Wan, Y., Wan, F., Md Noor, H., Ramin, A.K. (2011). *Preliminary Study of Rural Entrepreneurship Development Program in Malaysia*. International conference on management (ICM 2011) Proceeding, pp.537-545.
2. Babuchowska, K., Marks-Bielska, R. (2013). The Growth of Rural Entrepreneurship in the Context of the Implementation of the Rural Development Programme in 2007-2013. [In:] *Rural Development 2013: Innovations and Sustainability*. The Sixth International Scientific Conference. Aleksandras Stuglinskis University, Lithuania, 28-29th November, 2013, Vol. 6, Book 1, pp. 493-498.
3. Feher, A., Gosa, V., Hurmuzache, T., Raicov M. (2014). *The Development of Rural Entrepreneurship in Romania*. Economic Sciences for Rural Development 2014, Latvia University of Agriculture, Jelgava (International Scientific Conference Proceedings, 24-25 April 2014) (vol. 3(1), pp. 144-149.
4. Holcombe, R.G., (1998). *Entrepreneurship and Economic Growth*. *Quarterly Journal of Austrian Economics* 1(2), pp. 46-62.
5. Karaszewski, W. 2016 (ed.). *Bezpośrednie inwestycje zagraniczne w wybranych województwach Polski – analiza porównawcza (Foreign Direct Investment in Selected Polish Voivodships – Comparative Analysis)*. Wyd. UMK, Toruń.
6. Karaszewski W., Sudol S. (1997). *Empirical Research on the Process of Transformation of Polish Companies in the Period of 1990–1995*. Wyd. UMK, Toruń.
7. Kłodzinski, M. (2015). *Zagrożenia i szanse stojące przed rozwojem sektora przedsiębiorczości wiejskiej (Threats and Opportunities Facing the Development of the Rural Entrepreneurship)*. *Wies i Rolnictwo*. No 2(167). pp. 125-138.
8. Kukula, K. (2015). *Struktura oraz dynamika produkcji energii odnawialnej w państwach UE (Structure and Dynamics of Renewable Energy Production in the EU Countries)*. *Europa Regionum*. Vol. 23, pp. 173-184 (DOI: 10.18276/er.2015.23-14).
9. Marks-Bielska, R. 2017. *The Role of Local Authorities in Creating Conditions for the Development of Economic Activities: a Case Study of Rural Municipalities in Poland*. Proceedings of the 8 th International Scientific Conference Rural Development 2017. Edited by prof. Asta Raupelienė.
10. Potoczek, A. (2012). *Interwencjonizm samorządowy w praktyce działania władz publicznych (na przykładzie Funduszu Wsparcia w woj. kujawsko-pomorskim) (Interventional Self-government in the Practice of Public Authorities (an Example of the Support Fund in Kujawsko-pomorskie Voivodeship))*. *Studia Lubuskie*. Vol. VIII, pp. 245-265.

RURAL DEVELOPMENT IN EUROPEAN UNION POLICY

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Abstract. When in 1958, under the Treaty of Rome, the Common Market was established, agriculture of the six founding member states was strongly influenced by state interventionism. In order to include agricultural production in the free movement of goods, while maintaining public interventionism in the agricultural sector, national intervention mechanisms incompatible with the free movement principle had to be abolished and transferred to the Community level. Actions in this direction led to defining the objectives of the Common Agricultural Policy (CAP) as the first common policy established in the framework of the European Economic Community. Over time, it turned out that market mechanisms are far from sufficient and should be supplemented by structural instruments pertaining to the need for rural development. The aim of the European Union's rural development policy, which is the second pillar of the CAP, is to support the rural areas of the EU and to meet numerous economic, environmental and societal challenges. Its greater flexibility (compared to Pillar I) enables regional, national and local authorities to develop their own rural development programmes based on European mechanisms. In contrast to Pillar I, which is financed wholly by the EU, programmes under Pillar II are co-financed from EU funds and national, regional or local funds. The purpose of this article is to analyse the fundamental determinants of the rural development policy, its increasing role in the EU's economic strategy and the prospects for its further functioning. While preparing the text was used a method of critical reference to the literature of the subject of research, as well as a method of analyzing secondary sources, including studies describing substantive issues concerning the broadly understood agricultural policy of the European Union.

Key words: Common Agricultural Policy, rural areas, Multiannual Financial Framework, EU budget.

JEL code: O13, Q18.

The shaping of the EU' Common Agricultural Policy

The year 1962 is considered to be the beginning of the Common Agricultural Policy (CAP) of the European Economic Community (the EU's predecessor), created five years prior to that. Its fundamental objective was to provide the citizens of the Member States with affordable food while ensuring decent remuneration for farmers and thus an adequate standard of living. An important premise of the actions taken was the need to maintain food self-sufficiency, which was the aftermath of serious shortages of agricultural products after the end of World War II.

Among the first decisions were the introduction of a common pricing policy and a common organisation of agricultural markets as well as the launching of a support mechanism for agricultural incomes through guaranteed prices. The original objectives of the CAP were quickly achieved, which was viewed as evidence of its effectiveness; however, a phenomenon appeared, namely the increasing overproduction. Farms were becoming increasingly efficient, so that they began producing more food than actually needed. The surpluses were stored in warehouses, whose capacities soon proved insufficient. A wide array of measures was then introduced to better adjust production levels to market needs.

In the process of CAP evolution, a major breakthrough was the so-called MacSharry reform, implemented in the years 1992-1996. It consisted, inter alia, in the gradual lowering of intervention prices for certain agricultural products (mainly grain and beef) and in the introduction of compensatory payments for farmers. These payments were to compensate them for income losses resulting from the reductions in agricultural prices. Obtaining the aforementioned subsidies depended on the reduction of the crop areas and decreasing the intensity of animal production. The compensatory payments were later referred to as direct payments. For the first time, so-called accompanying measures were introduced, where the EU financed 50-75 % (depending on the region)

of the costs of programmes aimed at: afforestation, encouraging farmers to use production methods that protect the environment and the quality of rural areas as well as supporting the transition of farmers to early retirement and the transfer of farms to improve the agrarian structure (Komisja Europejska, 2014).

As part of the 1999 reform, the intervention buying-in prices for grain, beef, powdered milk, butter was reduced, and the scope of intervention in the beef market was limited. Farmers were compensated for the cuts in the intervention prices by increasing direct payments. As a result, the range of aid instruments for farmers in less-favoured regions was expanded and the need to support rural development was emphasised. In June 2003, the next reform of the CAP, defined as a fundamental one and aimed at increasing the competitiveness of Community agriculture as well as improving the quality of food, was agreed upon by the agriculture ministers of EU countries in Luxembourg. The provisions of the Council of the EU of 26 June 2003 determined the shape of the CAP in the years 2007-2013. The basic elements of the reform were: the separation of direct payments from actual production (decoupling); linking direct payments with the obligation to meet certain standards related to environmental protection, plant and animal health and good treatment of animals (cross-compliance); the reduction of the scale of direct payments for farms (so-called modulation) and the allocation of resources thus obtained for rural development; the introduction of the mechanism of the so-called financial discipline, consisting in the reduction of direct payments in the event of exceeding the CAP spending ceiling; a further increase in the scope and level of support for rural development (Hardt, 2003).

The CAP is the first of the common EU policies that is financed entirely from its budget. It was recognised that achieving a common goal would be more effective if the resources from the budget were mobilised than if the individual Member States acted on their own. This was supported by the existence of a single and constantly developing European market of agricultural products, where farmers can be guaranteed fair conditions of competition on the EU internal market (thanks to a common approach to supporting agriculture), and (based on the regulations of the customs union) on global markets.

New challenges facing the CAP

As early as in the 1970s, the conviction that agriculture cannot be reduced to the productive sphere only, i.e. the commercial one, and that it fulfils important sociocultural and environmental functions, began to solidify. This point of view resulted, inter alia, from such phenomena as the growing problem of depopulation and marginalization of large rural areas, a decline in competitiveness compared to urban centres or natural environment degradation. This made it necessary to undertake multidirectional actions to improve the social and technical infrastructure, to create non-agricultural employment opportunities and to maintain high-quality natural resources in rural areas. The importance of this problem is evidenced by the fact that over half of the population of EU member states live in rural areas, which cover 90 % of its territory (in Poland, rural areas constitute 93.1 % of the territory of the country, which is inhabited by 39.2 % of the total population). Agriculture and forestry are still of key importance in the field of land use and natural resource management in rural areas in the EU, and also serve as a platform enabling the diversification of the economy in rural communities. The necessity of strengthening the EU rural development policy became a general priority of the European Union, which was clearly expressed in the conclusions of the European Council in June 2001: 'In recent years, the European agricultural policy has put less

emphasis on market mechanisms and, thanks to the use of targeted support measures, it has become more geared towards satisfying the growing needs of the general public in terms of food safety and quality, product differentiation, animal welfare, environmental quality as well as nature and landscape protection '(Polityka UE, 2008).

The EU has not yet developed a definition of rural areas that could become not only the basis for theoretical analyses but also the starting point for formulating a coherent concept of their development. The standards found in the Council Decision of 20 February 2006 on the Community strategic guidelines for rural development for the period 2007-2013 (Decyzja Rady, 2006) can be regarded as the most useful. The areas where the rural population exceeds 50 % or those inhabited by less than 150 people/km² are considered rural areas. A significant classification proposed by the OECD is worth mentioning; it divides regions into:

- 1) predominantly rural regions, where over 50 % of inhabitants live in administrative units with population density less than 150 people/km²,
- 2) significantly rural regions, where the share of population inhabiting administrative units with population density lower than 150 people/km² is between 15 % and 50 % (Wieliczko, 2006),
- 3) predominantly urban regions, where the rural community constitutes less than 15 %.

A simplified definition has been adopted in the Rural Development Programme prepared by the European Commission and the Ministry of Agriculture and Rural Development of the Republic of Poland for the years 2014-2020: 'rural areas are terrains located outside the city administrative boundaries, i.e. rural communes or rural parts of urban-rural communes' ([PROW, 2018](#)).

Pillar II of the EU's Common Agricultural Policy

Agenda 2000 was of key importance in the EU discussion on the need for rural development. Its adoption was directly related to the prospect of accession for eight countries located in the Central and Eastern Europe region as well as Cyprus and Malta (Oleszko-Kurzyna, 2010). The lower level of development of the agricultural sector and rural areas in these countries posed new challenges to the EU. It was not only about the budgetary production support, but also about non-productive functions performed by agriculture, i.e. those with regard to culture, the landscape etc. Civilisational changes altered European countryside, which became not only a place for agricultural production but also for living or non-agricultural business activities. Increasing attention was paid to actions for the protection of the natural environment, food security, animal welfare or so-called multifunctional and sustainable agriculture.

The main contribution of Agenda 2000 was the extension of the impact of the CAP with the Pillar II, which included structural measures for the multifunctionality of agriculture and for rural development (Drugi filar WPR, 2019). In addition to the support for agri-environmental and afforestation activities or structural retirement schemes, assistance in, among other things, modernising farms, diversification into non-agricultural activities, adjusting farms to EU environmental standards or improving infrastructure in rural areas, was provided. Since that time, the CAP has ceased to be a typical sectoral policy, aimed solely at the development of agriculture, and it has become an integrated policy for rural development (agro rural policy).

As part of the division of tasks concerning the management of individual rural development programmes between the European Commission and the Member States, the latter designate a managing authority, an accredited paying agency and a certification body. Additionally, they provide and disseminate information on operations subject to co-financing. Each country establishes a

monitoring committee that ensures the effective implementation of the programme, while the authority which manages a given programme submits an annual report on its implementation to the Commission.

The reform of the CAP has been forced by contemporary challenges, which include food security, climate change, sustainable economic growth and creating employment opportunities in rural areas. It is also better adjusted to the expectations of the people: direct payments will be more fair and environment-friendly. Farmers will have a stronger position in the food supply chain, and the new CAP will be more targeted, efficient and transparent. It should also be mentioned that the new CAP supports market-oriented agriculture (for example, without export subsidies, which have been withdrawn in recent years). In 2011, agricultural products accounted for as much as 7 % of EU exports, which is equivalent to the amount exceeding EUR 100 billion – more than cars or pharmaceutical products. The CAP is, therefore, an important factor that promotes employment as well as smart and sustainable economic growth that prevents social exclusion. For 50 years, the CAP has become a truly European policy of strategic importance and, what is more, it is a genuinely Community policy.

The Rural Development Programme within the MFF 2014-2020 consists of 16 measures, most of which have been divided into sub-measures. It is worth briefly presenting a few of them (PROW, 2018).

Measure: 'Knowledge transfer and information actions' – two sub-measures: 'Vocational training and skills acquisition' and 'Demonstrations and information activities' (beneficiaries: public advisory entities, scientific institutions and universities, agricultural and forestry-related schools as well as entities conducting training activities; aimed at out-of-school education of agricultural producers and rural inhabitants, mainly through courses and training which raise the level of knowledge and promote innovations in the field of agriculture and forestry),

Measure: 'Quality schemes for agricultural products and foodstuffs' – two sub-measures: 'Support for new participants of food quality schemes' and 'Support for carrying out information and promotional activities'. The objective: introducing high-quality agricultural products and foodstuffs to the market (beneficiaries: a farmer or an entity created by at least two producers of agricultural products or foodstuffs, who work under quality schemes),

Measure: 'Investments in physical assets' – three sub-measures: 'Modernisation of agricultural holdings' (the objective: development of cow milk, beef cattle and piglets production and also operations focused on new innovative technologies, increasing the production scale and improving production quality); the sub-measure 'Processing and marketing of agricultural products' (the objective: processing and placing agricultural products on the market at the level of wholesale trade – the beneficiary: an entity with a registered activity in the field of processing or placing agricultural products on the market, which runs a micro, small or medium sized enterprise, or either a farmer or a farm household member subject to full social insurance for farmers); the sub-measure 'Land consolidation' (the objective: improvement in the area structure of agricultural holdings and forest land),

Measure: 'Restoring agricultural production potential damaged by natural disasters and introduction of appropriate prevention actions' – two sub-measures: 'Support for investment in preventive measures to limit the effects of probable natural disasters, adverse climatic events and catastrophic events' (support for investments that prevent damage caused to agricultural holdings by flood or heavy rainstorm) and the sub-measure 'Support for investments in the restoration of

agricultural land and restoring agricultural production potential damaged by natural disasters, adverse climatic events and catastrophes' (support for investments that restore the production potential damaged by natural disasters),

Measure: *'Development of farms and economic activity'* – five sub-measures: 'Bonuses for young farmers' (the beneficiary: a person aged 40 or under, with agricultural qualifications, who commences an agricultural activity for the first time or runs a farm No longer than 12 months before submitting the application); the sub-measure 'Restructuring small farms' (the objective: improvement in competitiveness and increasing profitability of small farms through an increase in the economic size of the farm, resulting mainly from the change in the profile of agricultural production); the sub-measure 'Bonuses for starting up non-agricultural activities' (the objective: diversification of activities in rural areas); the sub-measure 'Development of entrepreneurship – development of agricultural services' (the objective: creating conditions for competitive and modern agriculture and for the diversification of economic activity in rural areas, thus contributing to sustainable socio-economic development of rural areas); the sub-measure 'Payments for farmers transferring small farms' (the objective: a permanent transfer of the farm to another farmer),

Measure: *'Basic services and village renewal in rural areas'* – three sub-measures (the objective: improving living conditions in rural areas by providing access to basic services, including technical and cultural infrastructure, for people inhabiting rural areas, and supporting local development); the sub-measure 'Support for investments in the creation, improvement or expansion of all types of small scale infrastructure, including investments in renewable energy and energy saving'; the sub-measure 'Studies and investments associated with the maintenance, restoration and upgrading of the cultural and natural heritage of villages' (operations related to preservation of monuments and traditional architecture); the sub-measure: 'Support for investments in the setting-up, improvement or expansion of basic local services for the rural population, including leisure and culture, and the related infrastructure' (investing in recreation and cultural facilities and the related infrastructure, as well as operations associated with investments in marketplaces or building structures for the promotion of local products and services),

Measure: *'Agri-environment-climat'* (the objectives: sustainable fertilizer management, soil erosion prevention, soil and water protection, preservation and protection of valuable natural habitats and endangered plant and animal species, protection of endangered genetic resources of crops and farm animals as well as landscape diversity protection),

Measure: *'Organic farming'* (the objective: restoring, protecting and enriching ecosystems associated with agriculture and forestry, preventing soil erosion and improving soil management).

Financing the Rural Development Programme

The second pillar of the CAP is financed mainly from the budget of the European Agricultural Fund for Rural Development (EAFRD), which was established by Council Regulation (EC) No 1698/2005 (6). It aims to improve the effectiveness of measures under the rural development policy and to simplify its implementation. It makes it possible to improve the management and control of the rural development policy during the MFF 2007-2013. The regulation defined the general principles of Community support for rural development financed by the EAFRD. It also determined the objectives of the rural development policy, stressing that it should contribute to:

- increasing the competitiveness of the agricultural and forestry sectors,
- improving the natural environment and landscape,

- improving the quality of life in rural areas and increasing support for diversification of economic activity.

The EAFRD budget amounted to EUR 96.3 billion under the MFF 2007-2013, i.e. 20 % of the funds allocated to the CAP in this period. The fund is used by all EU countries in proportion to the position of the agricultural sector in their economies and existing needs. In the MFF 2014-2020, the fund has a comparable amount of EUR 99.6 billion, which is supplemented by EUR 61 billion from public funds of the Member States (the so-called own contribution). The largest beneficiaries of these funds are (in billion EUR): France (11.4), Italy (10.4), Germany (9.4), Poland (8.7), Spain (8.3) and Romania (8.1) (Commission, 2015).

The share of the CAP in the MFF 2014-2020 is distributed as follows: EUR 312.7 billion (29 %) is earmarked for market-related expenditures and direct aids (Pillar I), and EUR 95.6 billion (9 %) for rural development (Pillar II). Essentially, we are dealing here with two parallel phenomena: a decrease in the share of expenditures allocated for financing the CAP (currently 38 %, while in the early 1980s almost 70 %), and simultaneously a slow increase in funds directed to the implementation of the second pillar of the CAP (Skulimowska, 2013, EU agriculture, 2015).

Being the largest net beneficiary, Poland received a total of EUR 147.6 billion from the EU budget, of which EUR 92.5 billion for the cohesion policy and 47.6 billion for the agricultural sector in the years 2004-2018. The distribution of funds within the agricultural sector was as follows: Pillar I – EUR 30.2 billion, and Pillar II – EUR 17.4 billion.

Conclusions

In EU policy, the agricultural sector has played a significant role from the beginning. As part of successive reforms, increasing attention was paid to establishing the second pillar in the form of a rural development policy. Strengthening of this pillar within the CAP is inevitable in the face of the intra-EU and global challenges. The need for further complementing of the rural development policy after 2020 is confirmed, for example, by the recommendations specified in 2017 in the Cork 2.0 declaration. Much space has been devoted there to the needs for sustainable development, protection of natural resources and ensuring generational renewal. Moreover, a number of new priorities have been identified, with a particular focus on value chains in rural areas in the fields of clean energy, the emerging bioeconomy sector as well as the circular economy or ecotourism.

Bibliography

1. Commission Delegated Regulation (EU) (2015) No 2015/791, of 23rd May 2015 Amending Annex I to Regulation (EU) No 1305/2013 of the European Parliament and of the Council on Support for Rural Development by the European Agricultural Fund for Rural Development.
2. *Decyzja Rady z 20 lutego 2006 r. w sprawie strategicznych wytycznych Wspólnoty dla rozwoju obszarów wiejskich na lata 2007-2013* (2006) (Council Decision of 20 February 2006 on Community Strategic Guidelines for Rural Development - Programming Period 2007 to 2013) 2006/144/WE
3. *Drugi filar Wspólnej Polityki Rolnej: polityka rozwoju obszarów wiejskich* (2019) (Second Pillar Of The Cap: Rural Development Policy) http://www.europarl.europa.eu/ftu/pdf/pl/FTU_3.2.6.pdf (Access: 31.01.2019.).
4. *EU Agriculture Spending*, (2015) Agriculture and Rural Development http://ec.europa.eu/agriculture/index_en.htm (Access: 1.01.2019.).
5. Hardt Ł., (2003) *Implikacje reformy Wspólnej Polityki Rolnej dla polskiego rolnictwa i obszarów wiejskich*, UKIE, Warsaw, 2007; Ocena reformy WPR uzgodnionej w Luksemburgu 26 czerwca 2003 r. z perspektywy Polski (Evaluation of the CAP Reform Agreed in Luxembourg on June 26, 2003 from Poland's Perspective), Foundation of Assistance Programmes for Agriculture FAPA, Warsaw
6. *Europejski Fundusz Rolny na rzecz Rozwoju Obszarów Wiejskich (2015)* (European Agricultural Fund for Rural Development), European Commission, Brussels
7. Oleszko-Kurzyna B., (2010) *Rozwój obszarów wiejskich jako priorytet wspólnej polityki rolnej Unii Europejskiej* (The Development of Rural Areas as a Priority of the European Union's Common), Annales Universitatis Mariae Curie-Skłodowska, Vol. XLIV, Sectio H., pp. 103-105.

8. Polityka UE w zakresie rozwoju obszarów wiejskich na lata 2007–2013 (2008) (EU Policy on Rural Development for 2007–2013), Fact Sheet, Luxembourg: Publications Office of the EU. 4.
9. *Program Rozwoju Obszarów Wiejskich przygotowany przez Komisję Europejską i Ministerstwo Rolnictwa i Rozwoju Wsi RP na lata 2014-2020, (2018)* (Rural Development Programme 2014-2020), Warsaw
10. Skulimowska M., (2013) *Sprawozdanie na temat unijnego budżetu na lata 2014-2020* (Report on the EU Budget for 2014-2020) Report 120/2013, Brussels, December
<https://www.senat.gov.pl/download/gfx/senat/pl/defaultopisy/296/5/1/120.pdf> (Access: 30.12.2018).
11. Wieliczko B., (2006) *Polityka Unii Europejskiej wobec obszarów wiejskich* (The EU's Rural Development Policy), „Institute of Agricultural and Food Economics”, No 134, Warsaw p. 12, 42.
12. *Zrozumieć politykę Unii Europejskiej – Rolnictwo (2014)* (Understand the Policy of the European Union – Agriculture), Luxembourg: Publications Office of the EU

FACTORS IMPACTING WORK REMUNERATION IN THE CONTEXT OF SOCIAL SECURITY PROTECTION IN LATVIA

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Abstract. In recent years, more and more scientists and society have been discussing the competitiveness of work remuneration and social security, which has a significant impact on the well-being of local people. Every country has a social security system that largely depends on the social and economic situation as well as on the social policy implemented in the country. The research hypothesis: it is possible to identify and group factors impacting work remuneration in social protection. The research aim is to study the factors impacting work remuneration in the context of social protection in Latvia. The research results confirm that the factors influencing the level of wages may be divided into macroeconomic, microeconomic and personal individual factors. Low work remuneration indicates on lower welfare and social protection of the population. The research includes a population survey carried out in Latgale region, since the average monthly gross salary is lower in this region compared with the other statistical regions of Latvia. The population survey data show that the most important personal individual factors influencing work remuneration are the position held and the level of education. The workplace in an international or local company as well as the length of service are other important factors. The lowest average rating of the population is given to other factors possibly impacting the level of work remuneration such as age, gender, health and marital status.

Key words: work remuneration, social protection, impacting factors.

JEL code: J310, J380, F5, R0

Introduction

The capacity and sustainable development of the social security system, which protects individuals in case of social risk and provides the disabled persons with the means of existence, play an important role in ensuring public welfare.

Risks or needs that may cause the necessity for social protection are as follows: sickness / health care; disability; age; loss of a provider; family / children; unemployment; housing; and social exclusion not classified elsewhere. The basis of social security for the protection of population in case of social risks and its main task is to reduce the incurred losses and their impact on the ability of people to provide themselves with sufficient quality of life in a particular life situation (Sociala aizsardzība, 2015).

Every country has a social security system that largely depends on the social and economic situation as well as on the social policy implemented in the country. In Latvia, the social security system includes the state social insurance, state social benefits, social assistance and social services.

Under the Law „On State Social Insurance” (1997), the purpose of the social insurance system is to insure the risk of loss of earnings of a person or its dependents due to illness, disability, maternity, unemployment, age, accident at work or occupational disease of a socially insured person as well as additional expenses for the care of the child and the death of the socially insured person or its dependents.

The social protection of a person is significantly influenced by the amount of the mandatory state social insurance contributions paid from the income (work remuneration).

Several researchers like A.Grinfelde (2010), I.Latvieta (2012), E.Volskis (2008) and organisations such as Free Trade Union Confederation of Latvia (2011, 2014) have addressed social security and

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social protection issues in Latvia. In addition, social security issues are addressed in several studies by the Ministry of Welfare (Ministry of Welfare, 2019). I.Mietule (2012) and R.Liepina (2012) have summarised the factors influencing wages and analysed the trends of wage changes by sectors and regions in Latvia.

The research hypothesis: it is possible to identify and group factors impacting work remuneration in social protection.

The research aim is to study the factors impacting work remuneration in the context of social protection in Latvia.

The following tasks are subjected to the set aim:

- 1) to analyse the importance of work remuneration and factors related with it;
- 2) to assess the factors impacting work remuneration for the provision of social protection.

Research methods: monographic and descriptive methods, analysis and synthesis, graphic method, statistical method (time-series analysis, data grouping, analysis of intersection tables etc.) and sociological research methods – surveys of experts and population. The Affinity diagram is applied to systematise the expert opinions.

The present research is based on various scientific publications, publicly available documents, information available in databases and other sources.

Research results and discussion

1. Work remuneration and factors impacting it

Pursuant to the „Labour Law” (2001), **work remuneration** is a regular pay for work payable to an employee, and which includes wages and salaries and supplements specified by regulatory enactments, the collective agreement or an employment contracts as well as bonuses and any other types of payments related with work (Darba likums, 2001).

Work remuneration helps employees get the resources they need to meet their needs (Darba algas un ..., 2006).

The amount of a person's social guarantees (pensions, social insurance benefits) is significantly influenced by the gross wage to personal insurance contributions and insurance period (length of service).

The notions „wage subject to insurance contributions” and „insurance period” are more related with the calculation of state pensions and social insurance benefits.

According to the Law „On Maternity and Sickness Insurance” (1995), the **wage subject to insurance contributions** is the income from which the state social insurance contributions have been made.

Pursuant to the law „On State Social Insurance” (1997), the employer has to calculate the mandatory state social insurance contributions for each employee from the object of contributions and pay it into a special budget account.

The object of mandatory contributions of an employer and employee is all calculated income for work from which the personal income tax shall be withheld, without deduction of the non-taxable minimum, tax reliefs and eligible expenses for which the taxpayer is entitled to reduce the taxable income.

The object of mandatory contributions of a self-employed person is freely selected income from the production of goods, performance of work, provision of services, creative and professional activity and other income from the economic activity.

The European Social Charter states that all employees and workers have the right to a fair work remuneration that is sufficient to ensure decent living conditions for themselves and their families as well as the right to social protection (Par Eiropas Socialo..., 2001).

The interaction between the labour demand and supply determines the level of work remuneration (Erenberga R.G., Smita S.R., 2012). **Labour demand** depends on the demand for products and services as well as labour productivity. Labour productivity, in turn, depends on technologies, natural resources, quality of labour force, administration and organisation. Therefore, the demand for labour is simultaneously determined both by the individuals as characteristics of certain human resources and the technical resources and the work organisation of a particular company carried out by the company manager as well as the macroeconomic environment in the country (Darba algas un ..., 2006).

Professor V.Gaga (2013) emphasises that the level of labour productivity is affected by the level of the extensive use of work and the technical and technological condition of production.

The extensive characterisation of work reflects the degree of use of working time and its duration in a shift, while the other characteristics remain unchanged. The more working hours are used, the less is idle time and time consumption not related with the production; and the longer is the shift, the higher is work productivity. There are two visible boundaries to the extensive characterisation of work: the duration of a working day and the duration of a working week set by the legislator (Gaga V., 2013).

G.Libermanis (2006) admits that the demand for labour is influenced by the demand for performances of outstanding musicians, artists, actors, directors, writers, sportsmen and a variety of different „stars“.

Labour supply is determined by the number of population in certain age groups, the institutional environment (regulatory framework) and alternative sources of income, for example, the possibilities to work abroad, the level of pensions and benefits etc. Labour supply is also determined by the labour supply of immigrants and the readiness to work for a significantly lower salary (Libermanis, 2006).

The level of wages is determined by investments in human capital (education and health care). This is expressed both at the individual level (a person who has invested in education receives a higher salary) and at the company level (depending on the company's investment in training of employees).

Investing in human capital makes people more productive and emotionally richer. It is essential to maintain the base value of human capital and to increase its productivity in Latvia due to the decrease in the number of population and aging of the society (Latvijas ilgtspējīgas attīstības ..., 2010).

Researchers Siebert et al. indicate that a vocational training or a university degree is the requirement of an employer for skilled workers to avoid precarious working conditions. It is also related with the duration of employment, which, in turn, is linked to the quality of life as it affects the social life and involves a number of risk factors such as insecurity of employee income (Siebert A.A. et al., 2018).

Salaries and wages are influenced by various political, institutional (provisions of legal and regulatory enactments, activities of trade unions etc.), social and psychological factors. The wage gap from the market level is determined by the size of the company, the competitive labour force situation and the personnel management strategy (Darba samaksas un ..., 2014).

The following competitiveness aspects either directly or indirectly impact the work remuneration:

- GDP volume and its dynamics, and the welfare of population;
- GDP in terms of revenue, showing the distribution of revenue between the owners of labour and capital;
- labour taxes;
- minimum wage;
- costs of living characterised by the comparison of prices for goods and services;
- labour productivity and the structure of national economy (Darba samaksas un ..., 2014).

The study „Competitiveness of Wages and Social Guarantees in the Baltic States” (2014) concludes that the amount of GDP affects the level of wages (both the absolute GDP characterising the economic capacity and the relative GDP per capita characterising the general welfare of population), i.e. the wages are higher in the countries where GDP per capita is higher.

The minimum monthly wage is essential to ensure at least the minimum level of social protection for a person. A study by the Ministry of Welfare indicates that employers assess differently the impact of the increase of the minimum wage on the work remuneration in general. In companies with higher productivity, the increase of the minimum monthly wage does not have any impact on wages as they exceed the minimum wage. However, in companies with lower productivity and turnover, the size of work remuneration for the part of employees coincide with the minimum wage set in the country; thus, the employer has to increase wages irrespective of its possibilities (Darba algas un ..., 2006).

The level of work remuneration impacts the social protection of employees. Studies show that the main reason in Latvia for employees to leave and change work is higher remuneration (Velama videja menesalga, 2016). In turn, the reason for the employer to increase the salary is labour productivity. Nevertheless, different studies confirm that labour productivity has increased in recent years in Latvia. Higher labour productivity allows generating more value added per unit within a certain time unit and to raise work remuneration for employees (Saulaja I. et al., 2016).

Further the authors of the present research will determine the most important factors impacting work remuneration to ensure the social protection by means of the expert focus group discussion method.

2. Assessment of the factors impacting work remuneration for the provision of social protection

In November 2018, a discussion of the focus group experts was carried out within the framework of the research to identify the experts' opinion on the factors impacting the level of work remuneration for the provision of social protection of the population. Five experts participated in the focus group discussion. The criteria for selecting the experts were as follows: higher education; at least 5 years of experience in accounting or finance, calculation and planning of salaries and wages; experience in social protection; knowledge on the legal and regulatory enactments of the Republic of Latvia and the European Union in relation with the research topic. Selected experts represented different organisations: municipalities, businesses, consultancy and education institutions.

Based on the results of the focus group survey, the authors grouped the factors impacting the level of work remuneration using the Affinity diagram method, which was developed by Jiro Kawakita in the 1960s. The Affinity diagram is a method that helps systematise information, group data or topics. The diagram is suitable for the particular research to group the data from studies and ideas resulting from the focus group discussion and brainstorm (Using Affinity Diagrams..., s.a.).

Experts identified the most important factors impacting work remuneration and divided them into macroeconomic, microeconomic and personal individual factors.

Macroeconomic factors were subdivided into the following groups: social, technological, economic, political and legal factors (Table 1).

Table 1

Affinity diagram – factors impacting the level of work remuneration based on the expert focus group discussion results

Macroeconomic factors				Micro-economic factors	Personal individual factors
Social	Technological	Economic	Political and legal		
Number of population in certain age groups	Technology development trends	Price of labour force	Regulation of work remuneration (minimum wage)	Financial situation of the company	Length of service, education level of employees (knowledge, skills, competences)
Trends of immigration and emigration	Technical and technological state of production	GDP amount and dynamics	Tax legislation (labour taxes)	Remuneration system in the company	Position held, career growth opportunities
Employees' level of knowledge and skills	Development of e-commerce	Costs of living		Company activity sector	Type of company (local, international)
Attitude towards work (dependency on social benefits), health, leisure	Availability of prices of software	Unemployment rate	National social policy and the EU programmes	Geographical location of the company, market, sales (export)	Other: age, gender, health situation, marital status etc.
		Employment rate			
Other: development of social innovation and entrepreneurship etc.	Other: possibilities to use artificial intelligence in various sectors etc.	Comparative advantages of the regions	Other: opportunities of the population to work abroad etc.	Other: social contributions and other economic benefits to employees, investment in human capital etc.	
		Other: inflation rate etc.			

Source: authors' research

The expert focus group discussion was followed by a more in-depth population survey using the individual factors influencing the level of work remuneration determined by experts: length of service, level of education, career opportunities, type of company (local, international) and others: age, gender, health situation, marital status etc.

The research incorporated also a population survey, which was done in Latgale region, as the average monthly gross wage is the lowest there in comparison with the other regions of Latvia (Table 2). In 2017, wages in Latgale region were by 38.7 % lower than in Riga region and by 26.5 % lower than in Pierīga region. Low work remuneration indicates on lower welfare and social protection of the population. The calculated chain growth rates characterise the intensity of changes in the gross wage level in the regions of Latvia. In 2017, the most rapid increase in the average gross wage was observed in all regions of Latvia, which was influenced both by the increase of the minimum monthly wage and the improvement of the economic situation in the country.

Table 2

**The average monthly gross work remuneration in the regions of Latvia
 between 2013 and 2017**

Region	Average monthly gross work remuneration, EUR					Chain growth rate, %			
	2013	2014	2015	2016	2017	2014	2015	2016	2017
Riga	815	869	925	971	1044	6.63	6.44	4.97	7.52
Pieriga	677	721	770	806	871	6.50	6.80	4.68	8.06
Vidzeme	560	598	643	675	739	6.79	7.53	4.98	9.48
Kurzeme	608	651	693	716	775	7.07	6.45	3.32	8.24
Zemgale	597	645	683	725	786	8.04	5.89	6.15	8.41
Latgale	490	522	564	592	640	6.53	8.05	4.96	8.11
Latvia	716	765	818	859	926	6.84	6.93	5.01	7.80

Source: authors' construction based on the data of the Central Statistical Bureau (CSB), 2018

In total, 661 inhabitants of Latgale region participated in the evaluation of personal individual factors impacting the level of work remuneration. The questionnaire with the criteria to be evaluated was distributed electronically and in a printed form, and the residents were interviewed by telephone. The research period was from October 2018 to January 2019. The statistical data package SPSS (Statistical Package for the Social Science) and Microsoft Excel analysis tools were used to process the research results.

The questionnaire was developed so that the population assessed the personal individual factors impacting the level of work remuneration using the Likert scale in a 5-point system from 1 (lowest rating, i.e. with the lowest impact) to 5 (highest rating, i.e. with the highest impact on the level of work remuneration).

The survey data show that the highest rating (with 5 points) among the personal individual factors impacting the level of work remuneration have received the following factors: the position held and the level of education; these are the factors that mostly impact the level of work remuneration (Table 3).

Table 3

**Breakdown of the respondents' answers in a 5-point system assessing the
 personal individual factors impacting the level of work remuneration, %**

Personal individual factors	Breakdown of the respondents' (n=661) assessment, %				
	1	2	3	4	5
Education level of employees (knowledge, skills, competences)	3	5	17	38	37
Career growth opportunities	4	10	23	33	30
Position held	3	5	15	34	43
Length of service	4	9	21	40	26
Workplace – local company	5	10	23	41	21
Workplace – international company	4	9	21	41	25
Other: age, gender, health situation, marital status etc.	10	15	28	31	16

Source: authors' research

The highest percentage of respondents have assessed the following factors: job at international and local company as well as the length of service. These factors received 4 points. This means that the position held in the company and the level of education obtained significantly impact the level of social protection, and hence, the quality of life.

Analysing the survey results by means of the statistical methods, the average indicators are one of the most important figures. The average arithmetic figure is the sum of all variants of the sample set divided by the number of variants. Table 4 shows the average and mean indicators for the assessment of personal individual factors impacting the level of work remuneration.

Table 4

The average and mean indicators for the assessment of personal individual factors impacting the level of work remuneration (n=661)

Criterion	Mean	Average
Education level of employees (knowledge, skills, competences)	4	4.01
Career growth opportunities	4	3.74
Position held	5	4.10
Length of service	4	3.72
Workplace – local company	4	3.63
Workplace – international company	4	3.75
Other: age, gender, health situation, marital status etc.	4	3.29

Source: authors' research

In general, it should be concluded that the respondents' assessment of the position held as the individual factor influencing the salary level is high. The lowest average rating is given to other factors such as age, gender, health situation, marital status etc.

Conclusions

- 1) Work remuneration helps employees obtain the necessary resources to meet their needs. The level of work remuneration impacts the social protection and well-being of employees, while the level of work remuneration is determined by the interaction between labour demand and supply.
- 2) The factors impacting work remuneration based on the expert focus group discussions and using the Affinity diagram method were divided into three groups: macroeconomic, microeconomic and personal individual factors. Macroeconomic factors were subdivided into the following groups: social, technological, economic, political and legal factors. The research hypothesis was confirmed.
- 3) Within the research, a population survey was done in Latgale region, as the average monthly gross wage during the entire period analysed is the lowest there in comparison with the other regions of Latvia.
- 4) The population survey data analysis shows that the position held and the education level are the most significant personal individual factors impacting the level of work remuneration, and hence, the social protection. Other significant factors include a workplace in an international and local companies as well as the length of service. The least significant factors resulting from the population survey are age, gender, health situation and marital status.

Bibliography

1. Darba algas un to ietekmesosie faktori. Eiropas Savienības strukturfondū nacionālās programmas „Darba tirgus petījumi” projekts „Labklājības ministrijas petījumi” (Wages and Factors Impacting Work Remuneration. Project of the EU „Studies of Labour Market”) Nr. VPDI/ESF/NVA/04/NP/3.1.5.1./0001/0003. Rīga, 2006, 206 lpp.
2. *Darba samaksas un sociālo garantiju konkurētspēja Baltijas reģiona (Competitiveness of Wages and Social Guarantees in the Baltic Region) (2014)*. Retrieved: http://www.sif.gov.lv/nodevumi/nodevumi/3418/darba_samaksas_un_socialo_garantiju_konkursetspeja_baltijas_reģiona.pdf Access: 15.01.2019.

3. Ehremberg R.G., Smith S.R. (2012). *Modern Labor Economics*, London, Retrieved: file:///C:/Users/data/Desktop/Modern_labor_economics__theory_and_public_policy_0.pdf Access: 24.01.2019.
4. Free Trade Union Confederation of Latvia (2011). Social Security Policy in Latvia in Times of Crisis. Methodological material. Riga, p. 55.
5. Gaga V. (2013). *Darba ekonomikas un sociologijas daudzlīmeņu sistēmas*. Monografija (Multi-level Systems of Labour Economy and Sociology. Monograph). Retrieved: http://vladimirgaga.com/images/abook/Darba_ekonomika_III.pdf. Access: 15.11.2018.
6. Grinfelde A. (2010). Life Quality of Pensioners in Latvian Regions. Summary of doctoral thesis. Jelgava, p.113.
7. Latviešu I. (2012). European Social Fund Financing in the Welfare Sector in the Regions of Latvia. Summary of doctoral thesis. Jelgava, p.128.
8. *Latvijas ilgtspējīgas attīstības stratēģija 2030.gadam* (2010) (Latvia's Sustainable Development Strategy for 2030). Retrieved: <http://polsis.mk.gov.lv/documents/3323>. Access: 24.01.2019.
9. Libermanis G. (2006). *Mikroekonomika (Microeconomics)*. Riga: Kamene, 371. lpp.
10. Mietule I., Liepina, R. (2012). *Wage Trends in Latvia during the Downturn in Economy*. Retrieved: [http://www.rta.lv/uploads/source/content_EN/Science %20publications/Journal %20of %20Social %20scien ces/Nr_1\(4\).pdf](http://www.rta.lv/uploads/source/content_EN/Science%20publications/Journal%20of%20Social%20sciences/Nr_1(4).pdf). Access: 24.01.2019.
11. Ministry of Welfare of the Republic of Latvia (2019). *Nozares politika*. Darba tirgus. Publikācijas, pētījumi un statistika (Sectoral Policy. Labour Market. Publications, Studies and Statistics). Retrieved: <http://www.lm.gov.lv/lv/nozares-politika/darba-tirgus/darba-tirgus-statistika-un-petijumi/labklajibas-ministrijas-petijumi-13-nacionalas-programmas-petijumi>. Access: 24.01.2019.
12. On Maternity and Sickness Insurance (1995). The Law of the Republic of Latvia. Retrieved: <https://likumi.lv/ta/en/en/id/38051>. Access: 24.01.2019.
13. On State Social Insurance (1997). The Law of the Republic of Latvia. Retrieved: <https://likumi.lv/ta/en/en/id/45466>. Access: 24.01.2019.
14. Par Eiropas Sociālo hartu (On European Social Charter) (2001) Retrieved: <https://likumi.lv/ta/id/56569-par-eiropas-socialo-hartu>. Access: 24.01.2019.
15. Saulaja, I., Zvaigzne, A., Mietule, I. (2016). Labour Costs and Productivity in Latvia. Economics Science for Rural Development: Integrated and Sustainable Regional Development, Production and Co-operation in Agriculture. No 42. Jelgava: LLU, pp. 150-156.
16. Siebert A.A., O'Keeffe S., Thrän D. (2018). Social Life Cycle Assessment Indices and Indicators to Monitor the Social Implications of Wood-based Products. Retrieved: [https://www.sciencedirect.com/science/article/pii/S0959652617303724?via %3Dihub](https://www.sciencedirect.com/science/article/pii/S0959652617303724?via%3Dihub). Access: 24.05.2018.
17. Sociālā aizsardzība (Social Protection) (2015). Retrieved: <http://www.csb.gov.lv/statistikas-temas/termini/sociala-aizsardziba-36143.html>. Access: 24.02.2018.
18. Strādājošo mēnesa vidējā darba samaksa statistiskajos reģionos (Average Monthly Wage of Employed by the Statistical Regions). Statistics Database. Retrieved: <https://www.csb.gov.lv/lv/statistika/statistikas-temas/socialie-procesi/darba-samaksa/tabulas/dsg050/stradajoso-menesa-vidēja-darba-samaksa>. Access: 14.01.2019.
19. Using Affinity Diagrams to Make Sense from Brainstorming. Retrieved: <http://www.leanyourcompany.com/methods/Using-Affinity-Diagrams.asp>. Access: 24.01.2019.
20. Velama vidējā mēnesalga „uz rokas” būtiski pārsniedz vidējo algu valstī (Desirable Net Average Monthly Salary Significantly Exceeds the Average Salary in the Country) (2016). Retrieved: <http://www.kantartns.lv/velama-vidēja-menesalga-uz-rokas-butiski-parsniedz-vidējo-algu-valsti/>. Access: 24.01.2019.
21. Volskis E. (2008). Pension System's Development Problems in Latvia. Summary of PhD paper. Riga, p. 31.

DEFINING SOCIAL INNOVATION: THEORETICAL DISCOURSE

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Annotation. Although the scope of the theoretical discourse on business innovation today is remarkable and still growing, its off-spring „social innovation” is yet only in the process of formation. Gone are those days when economically advanced European Union countries made every effort to enhancing business innovation in their national economy sectors. Nowadays, even the most successful EU Member States show increasing interest in developing such innovation products that could overcome the failure of the existing national economy models to handle increasing social problems caused by regional disparities, social inequality, availability of primary and secondary education and health care. Latvia is one of those EU Member States, which still is exposed to uneven economic development and its caused social consequences such as unemployment, social exclusion, unavailability of social services in the regions. The intention of the authors is to explore the potential of target-oriented social innovation creation in Latvia regions to eliminate their disparities. In this respect, the authors consider that before conducting so specific research, it is first of all necessary to summarize the existing definitions of social innovation and, based on them, formulate a new, specially designed definition that would most precisely comply with and could be used in the context of regional development studies. The study uses monographic method, methods of analysis and synthesis, method of scientific induction and scientific deduction. In scope of the research, the authors have clarified the narrow and broad context of social innovation concept and have formulated a new definition, which will be used in the further authors’ research devoted to regional development studies.

Key words: social change, social problems, innovation.

JEL code: O35, O31.

Introduction

Activities related to promoting social innovation are increasingly included in the European Union regulatory enactments and development plans. It is emphasized that social innovation is a powerful tool for addressing social problems. However, the studies of scientific literature reveal the lack of unified and over-embracing approach to the issues related to the definition of social innovation. Therefore, this study is devoted to the analysis of the existing theoretical framework of social innovation.

The aim of the study is to analyse the concepts „innovation” and „social innovation”. In the study, the authors used the following methods: monographic method (to analyse theoretical literature sources and interpret various definitions); methods of analysis and synthesis to study the elements of the problem separately and to establish mutual relations; scientific induction method - to create scientific assumptions and similarities based on individual elements; scientific deduction method - logically systematize and explain empirical data. Within the framework of the study, the authors used scientific literature on evolution of innovation concept. The aim of the research is to analyse the theoretical discourse of social innovation concept. The specific research tasks are: 1) to clarify the common and different features of „innovation” and its off-spring „social innovation”; 2) to study and interpret the existing theoretical definitions of social innovation; 3) to formulate the definition that could be used in the further author’s research to explore the potential of target-oriented social innovation creation in Latvia regions to eliminate their disparities. The object of the current research is social innovation but the subject is theoretical discourse of social innovation definition.

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Research results and discussion

There is a growing demand for innovative solutions to social problems in society. While great progress has been made thanks to technology and advanced social services, yet every improvement brings new challenges and, accordingly, new problems. Nevertheless, critical societal challenges can also become opportunities with an active involvement of community actors. Since 2009, social innovation initiatives have been discussed at the European Commission, whereby social innovation has been associated with a contemporary and efficient solution for solving increasing numbers of various social needs. The economic crisis is seen as a motivating factor for the development of innovative solutions, while also promoting the exploitation of the society's own development potential. Also, the authors' previous research (Grinberga-Zalite, Oganisjana, Surikova, 2015) related with exploring different aspects of social innovation's dimensions gives evidence of social innovation's potential to deal with problems that existing institutional and political framework failed to address, e.g. climate change or increasing inequality.

The essence and development of innovation and social innovation

The concept of innovation was first introduced at the end of the 12th century in France, it was used in conversational language and denoted the ability of a person to invent something new.

In scientific society this term was first mentioned in the 19th century, when it meant the process of cultural diffusion, which involves the inclusion of elements of one culture in another culture.

In the beginning of the 20th century, the term „innovation“ appeared in the work of economists and sociologists (G.Tard, N.Kondratjev, J.Schumpeter) who had found a link between innovation and the dynamic development of society.

Today it is believed that Schumpeter is the founder of innovation theory who in 1912 in his Theory of Economic Development argued that „innovation is any possible change based on the creation of a new value method, entry into a new market or use of a new source of raw materials“. Thus, innovation is characterized not only by the invention, but also by the process by which the invention is realized. In the course of time, Schumpeter (1964) defined innovation as a combination of new elements (inventing new goods, methods, raw materials into an organization or industry), which is a novelty to the existing economic system. In Latvia, the term „innovation“ was first introduced in the Dictionary of Foreign Words (1996) and was explained as „novelty“ and „novation“.

The discourse of modern science and philosophy due to digitalization of economy and society has caused a rather ambiguous understanding of innovation. Moreover, the absence of a generally accepted innovation theory leads to the growing numbers of various innovation definitions, which often contributes to the change of the essence of this term. Accordingly, today in the theory two innovation positions are denoted - **innovation-process and innovation-result**.

The first position is clearly-defined in the definition of Hungarian researcher B. Santo „innovation - is a socio-technical-economic process that leads to a better product or technology through the practical use of ideas and inventions“. Whereas the second position is explained by Crozier and Friedberg, arguing that „innovation is a process of collective creation in which members of a collective entity learn, invent and develop new products, technologies and forms.“ The innovation definition that has been adopted in Latvia also refers to the process „Innovation is a process where (...)“.

The term „social innovation“ is relatively new, but the concept of social innovation itself has already existed long before, for example, when various social institutions emerged, shelters for poor people were established, and the emergence of cooperatives is also an example of social innovation.

Although there are still different opinions and discussions on the definition of the term „social innovation“, it is gradually gaining more prominence in the discussions on EU policy priorities. While working on the Europe 2020 strategy, the term „social innovation“ was used with great caution, but it is now present in almost all discussions on the formulation of smart and inclusive growth priorities and the possibilities to achieve them. Given the current emphasis on the need to seek new ideas to address societal needs, social innovation is gradually taking root in the operational programmes of the EU and its Member States.

The academic interest in **social innovation** began in the 60s of the 19th century. Academic literature provides a broad approach to conceptually defining social innovation's concept. The first researcher of the 19th century who used social innovation's concept was Webber, who used it to designate a social invention.

However, social innovation themes and concepts had existed long before. Mr. Franklin said that minor changes in the work of social organizations can solve many of the daily social problems. Many of the 19th century researchers, such as Mr Ouens, Mr Weber and Mr Marx, promoted their ideas for social innovation and anticipating profound social change. Later, several attempts were made to structure the field of social innovation, such as Moulaert and Nussbaumer (2005), Pol and Ville (2009), and Dobeles (2015). However, the literature studies give evidence that often all these categories lack systematic methodologies that simultaneously incorporate the concept of social innovation in different disciplines.

Nowadays, the idea of social innovation has become a vector of political-economic development of modern developed countries, and their origins date back to the 1990s, when the initiatives of the European Social Fund - NOW, ADAPT, HORIZ ON, LEADER - became the basis of a new approach to social policy making, breaking down borders between the state, the private sphere and civil society.

In the EU *Innovation Union*, special attention is paid to social innovation¹. The *Innovation Union* explains the term „social innovation“ as an opportunity to involve EU citizens in economic activities. The „Innovation Union“ initiative encourages Member States to use the European Social Fund for investment in social innovation projects. Social innovation projects are often viewed in parallel with the aspiration to reduce poverty at the European level. The *Innovation Union's* initiative stresses the need to enhance the support for social innovation measures in 2014-2020 and calls on the Member States to be more active in supporting social innovation projects. Social enterprises are also seen as an option how to improve the access for women and young people to the labour market, and to support other categories of disadvantaged workers.

Officially, the idea of social innovation was recognized in 2010, in the meeting of Z.M. Barroso and public activists and innovators, which led to the inclusion of concrete proposals in the Europe 2020 strategy.

The distinction between the concepts of „innovation“ and „social innovation“ is complicated because of the fact that science has a narrow and broad understanding of the term „social“. In a broad sense, „social“ is similar to the public and opposed to natural and biological factors. In a narrow sense, „social“ is related to the sociological, linked to social, i.e. human relationships as members of particular social groups. Consequently, social innovation in a narrow and broad sense differs. In a broad sense, all kinds of innovation can be considered as social: technological, economic, political, psychological, scientific, ecological, cultural etc., because they are

¹ The Innovation Union is one of the seven flagship initiatives of the EU 2020 strategy developed by the European Commission to identify national, European and international actions to be implemented in the field of innovation in order to achieve the goals of the EU 2020 strategy.

social phenomena and are attributed to the defined sphere of public life. Whereas in the narrow sense, social innovation is understood only as a change in the social sphere of society that leads to changes in social groups, their relationships, changes in social environment, social institutes and organizations.

In the scientific literature, the innovation is generally associated with **changes** (according to J. Schumpeter). But, in the authors' opinion, such an understanding is not fully correct and changes its nature, because innovation rather **commits changes**, but it is not a change itself. Accordingly, innovation and change - these are related processes, but not identical.

Table 1

The discourse of social innovation concepts

Definition	Authors
„The commitment of an individual or group to take responsibility for a social need or a set of social needs that are not satisfied“	Chambon et.al. (1982, p. 8)
„The process of collective creation, in which certain members of a collective entity learn, invent and develop new rules for cooperation and social conflict situation, or, in other words, new social practices, and in this process they acquire the necessary cognitive, rational and organizational skills“	Crozier & Friedberg (1993, p.19)
„Creating and implementing new ideas about social relations and social organisation“	Mumford (2002, p.253.)
„New organizational and institutional forms, new ways to act, new social practices, new mechanisms, new approaches and new concepts that bring specific achievements and improvements“	Centre de Recherche sur les Innovations Sociales (CRISES, 2004)
„New forms of social relations, including institutional and organizational innovations, new forms of production and consumption, and new relationships between economic and social development“	Neamtan un Downing (2005, p.12)
„Social innovation at local level is based on two pillars: institutional innovation (innovation in social relations, innovation in innovation dynamics) and innovation in the social economy, i.e. meeting the diverse needs of local communities“	Moulaert un Nussbaumer (2005, p. 2071)
„Providing innovation services in institutional forms“	Gerometta et al., 2005; Gallie et al., 2012
„Innovative activities and services based on the goal of meeting social needs and distributed primarily through organizations“	Mulgan (2006, p. 146)
„Changes in society's cultural, regulatory enactments or regulatory structures that improve its collective energy resources and improve its economic and social performance“	Heiskala (2007, p. 59)
„Innovations outside national or market organizations; in the social, charitable, voluntary, community sectors“	Haugh & Kitson, (2007, p. 975)
„Experiments for providing social services in socially excluded groups“	Phills et al., (2008, p.45)
„Social innovation - a new social practice with social goals and social means to achieve it“	Franz et al., (2012)
„Social innovation is the development and introduction of new ideas (products, services) to meet social needs and to create new social relationships and cooperation. Social innovation sets social goals and uses social means to achieve them „	Guide to Social innovation. European Commission, 2013
„Social innovation is innovation that is associated with social aspects both in terms of their purpose and their means, and in particular those relating to development and realization of new ideas which at the same time meet social needs and build new social relationships or expressions of cooperation, thus benefiting society and promoting its ability to act. „	<i>Regulation of the European Parliament and the Council (EU) No. 1296/2013 (11.12.2013)</i>

Source: created by the author based on theoretical literature studies

Due to its specificity, social innovation not only introduces constructive changes in society, but also causes unexpected side-effects with a high degree of risk and uncertainty, escalation of conflicts and contradictions. Sometimes the magnitude of these side-effects may be greater than the effect of social innovation itself, which may change the expected outcome.

Consequently, social innovation can be interpreted as a complex social process in which new elements are introduced and integrated into different spheres of society, resulting in significant and irreversible changes in the sphere of social relations. On the one hand, this process contributes to positive change in society, actively develops new social ties and relationships, new spiritual and

intellectual needs. But on the other hand, it can lead to a variety of destructive phenomena: social tensions, technological breakdown, conflicts, social protests etc., thus undermining the order in society.

Based on theoretical literature studies, the author has defined social innovation as „a new, sustainable and effective solution to address societal social problems and improve living standards“.

The literature studies also revealed that there are two types of social innovation:

- 1) social novation - social innovation that has been created but not yet implemented;
- 2) social innovation - innovation in the social sphere that has been implemented (Hubert et al. 2010; Murray, Caulier-Grice & Mulgan, G., 2010).

The social sphere covers the entire sphere of human life - from human lifestyles, work, health and leisure and ending with socio-ethnic relations and climate change on our planet.

The multidisciplinary theoretical research on social innovation provides a number of interrelated concepts, such as follow:

- *social system* (Westley, Antadze, Riddell, Robinson, & Geobey, 2014; Cajaiba-Santana, 2013);
- *social value* (Minks, 2011);
- *social (societal needs)* (Heller, 2014);
- *social problems* (Minks, 2011);
- *social challenges* (The Young Foundation, 2012a);
- *social impact* (Ortega, Furr, Liman, & Flint, 2014);
- *social change/societal transformation* (Cajaiba-Santana, 2013; Minks, 2011; OECD, 2010; Westley, Antadze, Riddell, Robinson, & Geobey, 2014);
- *social quality* (Li, Sun, & Lin, 2012);
- *quality of life* (Pol & Ville, 2009; Li, Sun, & Lin, 2012; OECD, 2010);
- *quantity of life* (Pol & Ville, 2009).

Accordingly, social innovations can be attributed to:

- employment, income, living standards and quality of the population;
- health, demography, maternity and children;
- social protection and public safety;
- all forms and forms of education, culture and leisure;
- environmental protection (Hubert, et al., 2010; Murray, Caulier-Grice, & Mulgan, 2010).

Since social innovation incorporates the social aspect, it helps to solve the problems of vulnerable groups of the population (such as the interests of children and young people, the elderly, the disabled, the poor, large families, refugees, etc.).

Conclusions, proposals, recommendations

- 1) The study of the theoretical framework of social innovation revealed that it is possible to distinguish a narrow and broad context of social innovation, which significantly differ. In a broad sense, all kinds of innovation can be considered as social: technological, economic, political, psychological, scientific, ecological, cultural etc., because they are social phenomena and are attributed to the defined sphere of public life. Whereas in the narrow sense, social innovation is understood only as a change in the social sphere of society that leads to changes in social groups, their relationships, changes in social environment, social institutes and organizations.
- 2) Alongside with the changes in society, its values and needs as well as owing to technological progress, the concept of social innovation is constantly adjusting to the new encountered

situations. Accordingly, academicians and innovation policy makers have to keep up with socio-economic changes and update the existing definitions with new refinements, especially related with the emergence of new ICT.

- 3) Based on the analysis of the existing definitions, the author has developed a new definition of social innovation „a new, sustainable and effective solution to address societal social problems and improve living standards“, which particularly complies with current social problems of Latvia and thus could be applied in the research works related with regional disparity analysis.

Bibliography

1. Cajaiba-Santana, G. (2013). Social Innovation: Moving the Field Forward. A Conceptual Framework. *Technological Forecasting and Social Change*, p. 82, pp. 42-51.
2. Centre de Recherche sur les Innovations Sociales (2004) CRISES Rapport annuel des activités du CRISES, Quebec.
3. Chalmers, D. (2012). Social Innovation: An Exploration of the Barriers Faced by Innovating Organizations in the Social Economy. *Local Economy*, 28(1), pp. 17-34.
4. Chambon, J.-L., David, A., and Devey, J.-M., (1982) *Les innovation sociales*, Paris: Presses Universitaires de France.
5. Crozier, M., Friedberg, E. (1993). *Die Zwänge kollektiven Handelns – Über Macht und Organization*, Frankfurt/M.&Hain, Beltz Athenaum
6. Dobeļe, L. (2013). Social Entrepreneurship Development Possibilities in Latvia. Doctoral Thesis. Retrieved from http://lufb.llu.lv/dissertation-summary/entrepreneurship/LasmaDobeļe_promoc_d_kopsavilkums_2014_LLUESAF. Access: 12.12.2018.
7. European Commission (2012). Strengthening Social Innovation in Europe. Journey to Effective Assessment and Metrics. Retrieved from http://ec.europa.eu/enterprise/policies/innovation/files/social-innovation/strengthening-social-innovation_en.pdf. Access: 12.12.2018.
8. European Commission. (2013). Guide to Social Innovation. Retrieved from http://ec.europa.eu/regional_policy/sources/docgener/presenta/social_innovation/social_innovation_2013.pdf. Access: 12.12.2018.
9. Franz, H.W., Sarcina, R., Jürgen H. (2012) Facilitation social innovation and cluster development. pp. 24-29.
10. Grinberga-Zalīte, G., Oganisjana, K., Surikova, S. (2015). The Study of Social Innovation Theoretical Framework for Enhancing of Rural Development and Agriculture in Latvia. *Proceedings of the International Scientific Conference „Economic Science for Rural Development“*, Latvia University of Agriculture. Jelgava, 2015. No. 40: Marketing and sustainable consumption. New dimensions in the development of society, pp. 205-215.
11. Haugh, H., Kitson, M., (2007), *The Third Way and the Third Sector: New Labour's economic policy and the social economy*. *Cambridge Journal of Economics*, 31 (6), pp.973-974.
12. Heiskala, R., (2007). Social innovations: Structural and power perspectives. In T. J. Hamalainen & R. Heiskala (Eds.), *Social Innovations, institutional change and economic performance*. Cheltenham: Elgar.
13. Heller, C. (2014). The social innovation revolution. *Print*, 68(3), 40-43.
14. Hubert, A. et al. (2011). *Empowering People, Driving Change: Social Innovation in the European Union*. Bureau of the European Policy Advisers, European Commission.
15. Li, Y.; Sun, Y.; Lin, K. (2012). Social Innovation, Local Governance and Social Quality: The Case of Intersectoral Collaboration in Hangzhou City. *International Journal of Social Quality*, 2(1), pp.56-73.
16. Minks, M. (2011). *Social Innovation: New Solutions to Social Problems*. A Thesis submitted to the Faculty of The School of Continuing Studies and of The Graduate School of Arts and Sciences in partial fulfillment of the requirements for the degree of Master of Arts in Liberal Studies.
17. Moulaert, F., Nussbaumer J., *Defining the Social Economy and its Governance at the Neighbourhood Level: A Metodological Reflection*, *Urban Studies*, 42(11), pp.2071-2088.
18. Mulgan, G., Tucker, S., Ali, R., Sanders, B. (2006). *Social Innovation: What It Is, Why It Matters and How It Can Be Accelerated*. Working Paper. London: The Young Foundation, The Basingstoke Press. pp. 27.
19. Mulgan, G., (2006) *The process of social innovation*. *Innovations: Technology, Governance, Globalization*, Vol. 1, No.2, pp. 145-162. MIT Press
20. Mumford, M.D. (2002). Social innovation: Ten cases from Benjamin Franklin. *Creativity Research Journal*, 14(2), pp.253-266.
21. Murray, R., Caulier-Grice, J., Mulgan, G. (2010). *Ways to Design, Develop and Grow Social Innovation: The open book of social innovation*. The Young Foundation & NESTA. Retrieved from <http://youngfoundation.org/wp-content/uploads/2012/10/The-Open-Book-of-Social-Innovationg.pdf>. Access: 12.12.2018.
22. Neamtan, N., Downing, R (2005) *Social economy and community economic development in Canada: Next steps for public policy*. Issues paper by the Chantier de l'Economies Sociale in collaboration with the

Canadian Community Economic Development Network (CCEDNet) and Alliance Recherche Universities
 Communautés en Économie Sociale (ARUC-ES)

23. OECD (2010). SMEs, Entrepreneurship and Innovation. Series: OECD Studies on SMEs and Entrepreneurship. OECD Publishing.
24. Ortega, S.; Furr, N.; Liman, E.; Flint, C. (2014). The Science of Social Impact Innovation: How to Deliver More Impact through Innovative Business Models. *International Journal of Innovation Science*, 6(2), pp.73-82.
25. Phillips, J.A., Jr., Deigmeier, K., Miller, D.N.(2008). Rediscovering social innovation. *Stanford Social Innovation Review*, Fall, pp.34-43
26. Pol, E.; Ville, S. (2009). Social innovation: Buzz word or enduring term? *The Journal of Socio-Economics*, 38(6), pp.878-885.
27. Santo B. (2009) A Positive Theory of Social Entrepreneurship. *Journal of Business Ethics*, Vol. 111, No. 3, pp. 335 – 351.
28. Schumpeter, J. A., (1964): *Theorie der wirtschaftlichen Entwicklung* (6th ed.), Berlin: Duncker & Humblot
29. The Young Foundation (2012a). Social Innovation Overview - Part I: Defining social innovation. A deliverable of the project: „The theoretical, empirical and policy foundations for building social innovation in Europe” (TEPSIE), European Commission – 7th Framework Programme, Brussels: European Commission, DG Research. Retrieved from [http://www.tepsie.eu/images/documents/TEPSIE.D1.1.Report.DefiningSocialInnovation.Part %201 %20- %20defining %20social %20innovation.pdf](http://www.tepsie.eu/images/documents/TEPSIE.D1.1.Report.DefiningSocialInnovation.Part%20-%20defining%20social%20innovation.pdf). Access: 24.12.2018.
30. Weber, M. (2012). Social Innovation and Social Enterprise in the Classroom: Frances Westley on Bringing Clarity and Rigor to Program Design. *Academy of Management Learning & Education*, No. 11(3), pp. 409–418.
31. Westley, F., Antadze, N, Riddell, D. J., Robinson, K., Geobey, S. (2014). Five Configurations for Scaling Up Social Innovation: Case Examples of Nonprofit Organizations From Canada. *The Journal of Applied Behavioral Science*, 50(3), pp.234-260.

EU REGIONAL POLICY SUPPORT FOR RURAL LOCAL DEVELOPMENT IN EASTERN POLAND

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Abstract. The aim of the study was to investigate if the rural communes of Eastern Poland, which is the poorest macro-region of Poland and one of the poorest of the EU, benefited from EU regional policy as much as other rural communes in the country. Based on the secondary data from the Ministry of Regional Development, Central Statistical Office and National Court Register the total amounts of EU funding absorbed by these communes as well as Rscr index were calculated. Communes were categorised based on the absorption value, which made a tool for comparative analysis. The findings proved that on average rural communes of Eastern Poland benefited from EU regional policy funding more than other rural communes in the country. However, there were significant differences between and within rural areas of NUTS 2 regions forming Eastern Poland, which can be an indication for amending regional policy as a tool supporting rural areas lagging behind in social and economic development.

Key words: EU regional policy, rural areas, Eastern Poland.

JEL code: R00.

Introduction

The European Union cohesion and regional policies were established to reduce structural disparities resulting from economic, social and territorial imbalances among regions (My Region ..., 2017). As there are not only significant inequalities among regions, but many regions also experience considerable internal development disparities between and within urban and rural areas, the EU regional and cohesion policies support local development. And so they aim at supporting endogenous development, identified with bottom-up development and has long been recognised as a special form of regional development (Coffey and Polese, 1984; Ploeg and Long, 1994; Lowe et al., 1995).

Structural funds, which have been the main measures of implementing these policies have generally been addressed to NUTS 2 regions lagging behind in social and economic development, i.e. those whose GDP per capita has been lower than 75 % of the average EU GDP per capita. Since Poland's accession to the EU in 2004, all 16 Polish NUTS 2 regions have met this basic criterion and qualified for EU regional policy assistance. The very low GDP per capita in five of Polish regions of Eastern Poland, i.e. Warminsko-Mazurskie, Podlaskie, Lubelskie, Swietokrzyskie and Podkarpackie (fig. 3) has classified them amongst the poorest regions in the EU².

Due to its social and economic situation Poland has been the biggest beneficiary of EU regional policy funding since the budget perspective of 2007-2013. EU structural funds 2007-2013 were allocated in Poland under four nationwide operational programmes (OPs), i.e. Infrastructure and Environment OP (IENOP), Human Capital OP (HCOP), Innovative Economy OP (IECP), Technical Assistance OP (TAOP), under one multiregional Development of Eastern Poland OP³ (DEPOP), and 16 Regional Operational Programmes. EU regional policy funding from operational programmes 2007-2013 was available to a wide range of beneficiaries, including local self-governments who are the most important actors of endogenous sustainable local development. Their role in this process is determined by the current legal regulations [Law of March 8, 1990; Law of 24 July, 1998) and from international agreements (UN 1992; ONZ 2012; UN 2015). In practice, the role of local self-government in supporting local rural development is significantly limited by financial restraints

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² The division of Poland into the richer Western regions and poorer Eastern region is also confirmed by findings of other analysis (Wojewodzka-Wiewiorska and Dudek, 2016).

³ The multiregional Operational Programme Development of Eastern Poland (DEPOP) was addressed solely to the five above mentioned poorest regions of Poland, but it aimed mainly at supporting the development of urban areas.

(Kolodziejczyk, 2001). Operational programmes providing a non-repayable financial support to a wide range of investment projects were to lessen this key development barrier especially in regions lagging behind in social and economic development, such as Eastern Poland. However, to obtain EU funding rural self-governments of Eastern Poland had to compete with urban and rural beneficiaries from all over the country under nationwide OPs and with beneficiaries from their regions under regional OPs, which were Lubelskie ROP, Podkarpackie ROP, Podlaskie ROP, Swietokrzyskie ROP, Warminsko-Mazurskie ROP. As all beneficiaries had to co-finance EU supported projects from domestic sources, the rural self-governments of the five poorest regions in the country, might have been less successful in obtaining financial assistance from this source. So the hypothesis set for this paper is: rural areas of Eastern Poland benefited from EU regional policy support less than rural areas in other regions of the country.

To verify this hypothesis, the aims of this elaboration were: (1) to define how much rural local self-governments of Eastern Poland absorbed from Operational Programmes 2007-2013, (2) to compare the outcomes with absorption of EU funding by other rural communes in the country, (3) to define the budgetary significance of the absorbed EU funding.

The applied research methods

The study was carried out based on data concerning all projects carried out by rural communes in Poland under operational programmes 2007-2013. Rural communes were defined according to the latest version of DEGURBA classification. The quantitative secondary data was obtained from the National Information System (SIMIK), the Ministry of Regional Development, which has been the Polish implementing agency for operational programmes and the Central Statistical Office of Poland, Local Data Bank. As the implementation of operational programmes 2007-2013 ended on 31 December, 2015, the data set includes information on 14754 projects carried out by 1870¹ rural communes in Poland as of December 2015. The SIMIK dataset was verified with the data from the National Court Register. The verified SIMIK data enabled further calculation of:

- the value of EU funding obtained by each rural commune in Poland, and next:
- the differences ($D1$) between the value of EU funding obtained by rural communes in Eastern Poland (V_{RCEP}) and the average value of EU funding obtained by all rural communes in the country (AV_{RCC}):

$$D1 = V_{RCC} - V_{RCEP} \quad (1)$$

Based on the above results on the average absorption per 1 rural commune in the country as a threshold value, the rural communes were categorised into 4 classes:

- class 1: the communes that absorbed less than 50 % of the average EU funding per one rural commune in the country;
- class 2: the communes that absorbed from 50 % up to 100 % of the average EU funding per one rural commune in the country;
- class 3: the communes that absorbed from 100 % up to 150 % of the average EU funding per one rural commune in the country;
- class 4: the communes that absorbed 150 % and more of the average EU funding per one rural commune in the country.

¹ Only 8 rural communes in Poland did not absorb EU funding from operational programmes 2007-2013.

The study also looks into the quantitative significance of EU funds for communes in the years 2007-2013, which was defined based on the relation of the sum of EU co-financing obtained from all OPs 2007-2013 to the average annual revenues of commune budgets in the analysed years (Rscr

index, based on the formula:
$$Rscr = \frac{\sum_{i=2007}^{2015} fu_i}{(\sum_{i=2007}^{2015} br_i)/n} \times 100\%$$

where:

fu_i – total EU funding obtained from operational programmes 2007-2013, in PLN,

br_i – total budget revenues of LAU 2 in a given year, in PLN,

n – number of years (9) of the real time of implementation of OPs 2007-2013, i.e. from 2007 to 2015¹.

The aim of the research was also to check whether there is a correlation between the obtained EU funding and the two most important endogenous development factors such, i.e. population and the total budget revenues of the communes. The population was taken into consideration as a factor generating developmental needs, while budget revenues can determine communes' capability to co-finance the projects from domestic sources, as required by EU regional policy principles.

The aim of the research was also to check whether there is a correlation between the obtained EU funding and the two most important endogenous development factors such, i.e. population and the total budget revenues of the communes. The population was taken into consideration as a factor generating developmental needs, while budget revenues can determine communes' capability to co-finance the projects from domestic sources, as required by EU regional policy principles.

The novelty and topicality of the research.

The EU budget perspective 2007-2013 was the first one in which Poland participated from the beginning till its end, and so the results of implementing operational programmes 2007-2013 make the first and so far the only² complete basis for studies on the effects of EU funding absorption by different groups of beneficiaries in the country. A wide range of beneficiaries of operational programmes 2007-2013 included local self-governments, who are not only the most important actors of endogenous sustainable local development, but they are also the group of beneficiaries who absorbed the biggest share of EU funding under operational programmes 2007-2013 (Rakowska, 2016). Although there were numerous studies on different aspects of EU funding absorption (Poweska, 2018; Poweska 2016; Pomianek and Drejerska 2016), it has not been investigated so far how much all rural communes of Eastern Poland, the poorest macro-region in the country, benefited from this source and how this absorption differed from the absorption by other rural communes in the country.

The findings can be helpful in taking decisions on either continuing so far system of allocation of EU funding in Poland or on changing it, e.g. by addressing more funds to rural local units lagging behind in social and economic development. Thus the study can contribute to the realisation of evidence- and place-based EU (Barca, 2009) and domestic regional policy.

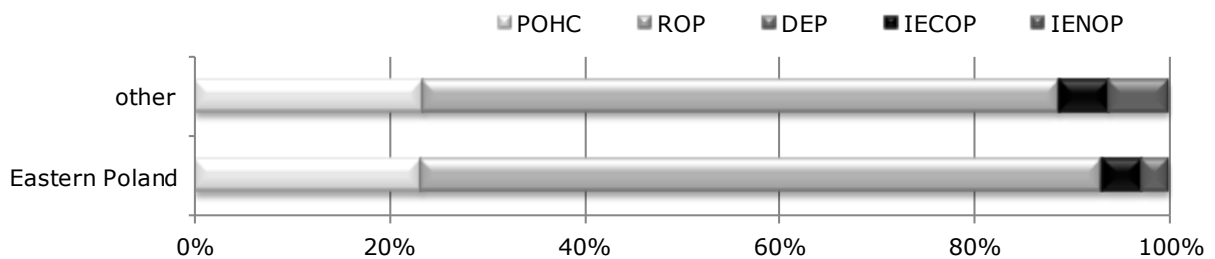
Research results and discussion

Eastern Poland includes 709 communes (LAU 2), of which 595 (84 %) are defined by Degurba classification criteria as rural. All these rural communes were beneficiaries of operational programmes 2007-2013. They absorbed 4115.14 mln PLN. As much as 70 % of this sum came from Regional

¹ According to EU regional policy rule 'n+2'.

² As Poland participated in the budget perspective 2000-2006 partly, since the accession on May 1, 2004, and the implementation of operational programmes 2014-2020 of the on-going budget perspective will end and provide complete data on December 31, 2022.

Operational Programmes (ROP) of the 5 voivodships forming this macro region, 23 % from Human Capital OP (HCOP) and only 4 % and 3 % from Innovative Economy OP (IECOP) and Infrastructure and Environment OP (IENOP). The structure of EU funding absorbed by rural communes of Eastern Poland was quite similar to the structure of EU funding absorbed by other rural communes in the country (fig. 2). The very small share of funding absorbed in both cases from Innovative Economy OP (IECOP) and Infrastructure and Environment OP (IENOP) proves, that the principles of these programmes assuming realisation of big investments were not favourable to rural communes. The Operational Programme Development of Eastern Poland appeared to be the source of the smallest financial EU assistance to rural communes, which results from the fact that it was addressed mainly to urban communes.



Source: author's calculations based on SIMIK data.

Fig. 1. The structure of EU funding absorbed by rural communes of Eastern Poland and in rest of the country by operational programmes 2007-2013

The regional operational programmes were a new tool of EU regional policy, introduced in member states in budget perspective of 2007-2013 for the first time. They were adjusted to different development needs of individual NUTS 2 regions, in Poland called voivodships. The results show that regional operational programmes were the main source of EU funding for rural communes of Eastern Poland. That proves that the aims of these 5 regional programmes were well-adjusted to the needs of rural areas, and that the rules of obtaining EU funding from this source were more favourable to rural communes than from nationwide operational programmes. Moreover, the competition for EU funding from regional programmes was limited to potential beneficiaries only from the given region, which for rural communes was another favourable condition. Only Human Capital Operational Programme stands out in the group of nationwide programmes, as it was a source of more than 20 % of total EU funding absorbed both by rural communes of Eastern Poland and by rural communes in the rest of the country. This programme offered the possibility of EU co-funding for smaller projects, which at the same time require smaller sums of domestic co-funding, affordable to rural communes.

Projects carried out by rural communes under five Regional Operational Programmes were only hard ones, resulting in construction, modernisation or extension of different elements of technical and social infrastructure. Projects carried out by rural communes under Humane Capital OP were mostly soft ones, including trainings, educational activities for children and the youth as well as organisation of numerous cultural and sports events. The hard projects were mostly related with modernisation or equipping the local educational infrastructure, rather rarely with building new or extending already existing kindergarten or school buildings.

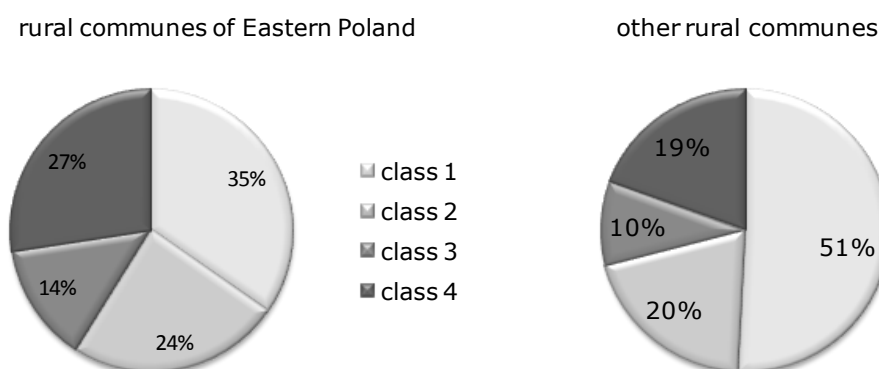
The total sums of EU funding obtained by rural communes in Eastern Poland were moderately correlated with their population (Pearson's $r_{xy} = 0.509$, $p < 0.000$, $\alpha = 0.05$). The sums of EU funding obtained by rural communes in this macro-region were also moderately correlated with their average annual total revenues for 2007-2013 (Pearson's $r_{xy} = 0.576$, $p < 0.000$, $\alpha = 0.05$). Both the results

indicate that neither the population, nor the budget revenues were a very significant factor influencing absorption of EU funding by rural communes of Eastern Poland.

To verify the hypothesis that rural areas of Eastern Poland benefited from EU regional policy support less than rural areas in other regions of the country, the rural communes of Eastern Poland were categorised into four classes based on the amount of EU funding absorbed by them and referred to the average of EU funding absorbed by all rural communes in Poland. As the average of EU funding 2007-2013 per one rural commune in Poland appeared to be equal 6.12 mln PLN, it made the threshold for defining the following classes:

- class 1: the communes that absorbed less than 50 % of the average EU funding per one rural commune in the country, i.e. less than 3.06 mln PLN;
- class 2: the communes that absorbed from 50 % up to 100 % of the average EU funding per one rural commune in the country, i.e. from 3.06 to 6.12 mln PLN;
- class 3: the communes that absorbed from 100 % up to 150 % of the average EU funding per one rural commune in the country, i.e. from 6.12 to 9.17 mln PLN;
- class 4: the communes that absorbed 150 % and more of the average EU funding per one rural commune in the country, i.e. more than 9.17 mln PLN.

The findings show that 41 % of rural communes of Eastern Poland absorbed EU funding of a higher value than the national average for rural communes, while only 29 % of rural communes in the rest of the country achieved this level. The subgroup including classes 1 and 2 also had a better layout in case of rural communes of Eastern Poland: 35 % of this units achieved the lowest level of EU co-funding, while in the rest of the country this group included 51 % of rural communes.

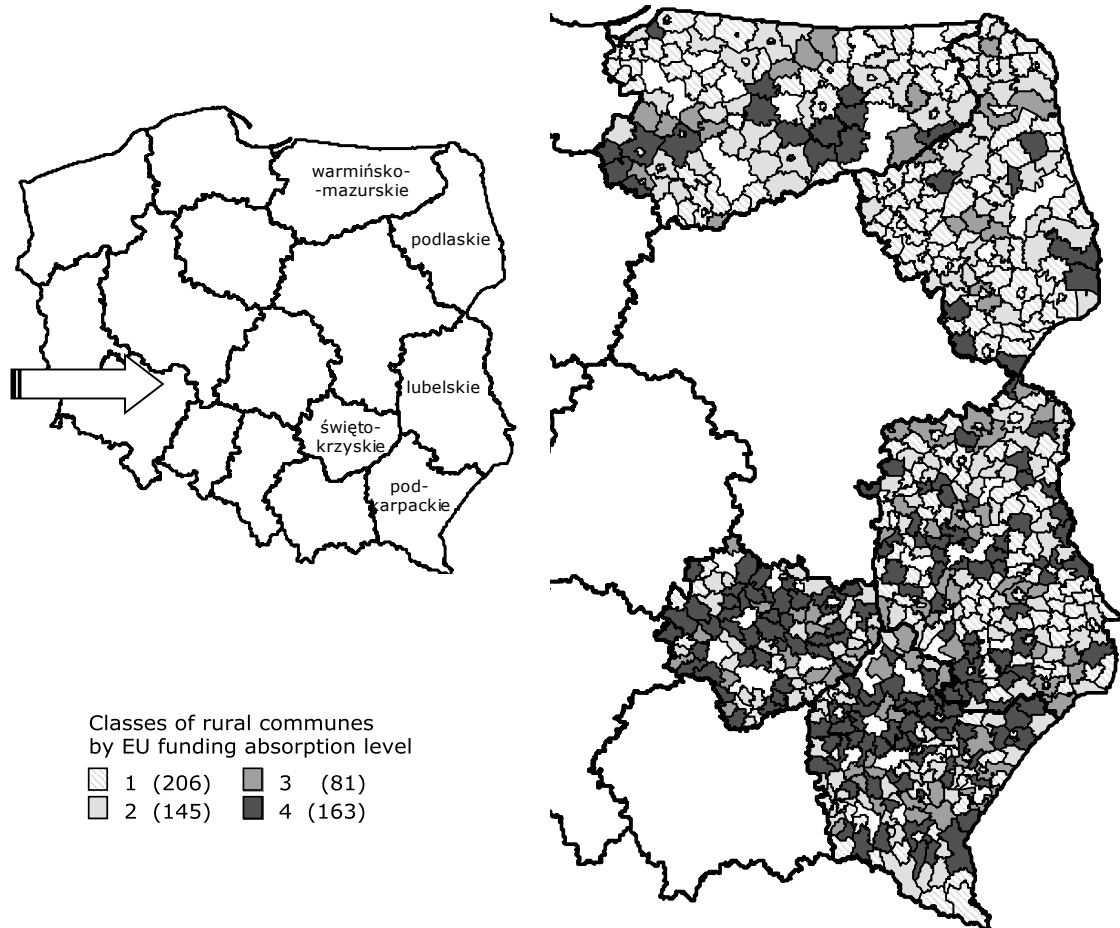


Source: author's calculations based on SIMIK data

Fig. 2. The structure of rural communes in Eastern Poland and the rest of the country by classes of absorption of EU funding

The above discussed findings lead to the question whether there are differences between rural communes of NUTS 2 regions within Eastern Poland. The spatial differentiation of rural communes by classes of EU funding absorption is quite significant, as shown in Fig. 3. The best absorption level was achieved by rural communes of Swietokrzyskie voivodship, where 84 % of them absorbed more EU funding than the national average for rural communes. The second best was Podkarpackie, where 51 % of rural communes absorbed more than the national average of EU funding per rural commune. Only 39 % of rural communes of Lubelskie voivodship absorbed more than the national average. The poorest results were achieved by rural communes of Warminsko-Mazurskie and Podlaskie, where not only the share of rural communes above the national average was small (correspondingly 29 % and 16 %), but also the share of the communes in the lowest class 1 of EU funding absorption was very high (correspondingly 35 % and 59 %).

The above presented findings prove that there are significant differences in EU funding absorption among rural communes of individual voivodships of Eastern Poland. There are also significant differences within two voivodships, i.e. Lubelskie and Warmińsko-Mazurskie, while Świętokrzyskie and Podkarpackie are relatively unified towards high absorption levels and Podlaskie is relatively unified towards low absorption levels by rural communes.



Source: author's calculations based on SIMIK data

Fig. 3. Spatial differentiation of classes of rural communes in Eastern Poland by the level of EU funding absorption

Based on the Rscr index, the EU funding absorbed by rural communes of Eastern Poland made from 0.3 % up to 175 % of their average annual total budget revenues for 2007-2013. For 96 studied communes obtained EU funding made less than 10 % of average annual total budget revenues, while for 21 Rscr was higher than 100 %. Other rural communes of this macro-region are characterised by Rscr within these brackets.

The correlation between the Rscr index value and the classes of rural communes by the absorption level was strong (Pearson's $r_{xy} = 0.725$, $p < 0.000$, $\alpha = 0.05$).

Conclusions and recommendations

The above presented findings lead to the following conclusions.

- 1) Rural communes of Eastern Poland benefitted from the EU regional policy funding on average more than other rural communes in the country.
- 2) The budgetary significance of the absorbed EU funding for very different for individual rural communes, as it varied from 0.3 % up to 175 % of their average annual total budget revenues for 2007-2013.

- 3) On the local level there are significant differences in the absorption of EU funding between and within rural areas of NUTS 2 regions of Eastern Poland.
- 4) The value of EU funding absorbed by rural communes of Eastern Poland was not significantly correlated with such endogenous factors as population or budget revenues.
- 5) Regional Operational Programmes and Human Capital OP were the main sources of EU funding for rural communes of this macro-region, which indicates what aims of programmes and what rules of granting EU co-funding are favourable to this group of communes.
- 6) As the budget perspective of 2014-2020 is still on-going, there is an urgent need to define the reason(s) for a very low absorption of EU funding by such large groups of rural communes in Podlaskie and Warminsko-Mazurskie voivodships and to investigate whether the rules and aims of Regional Operational Programmes for these NUTS 2 can be adjusted more to the absorption capacity of their rural communes.

Bibliography

1. Barca, F. (2009). An Agenda for Reformed Cohesion Policy. A Place-based Approach to Meeting European Union Challenges and Expectations, Report, Commission for Regional Policy.
2. Coffey, W.J., Polese, M. (1984). The Concept of Local Development: A Stages Model of Endogenous Regional Growth, *Papers in Regional Science* 55(1), pp. 1-12, doi.org/10.1111/j.1435-5597.1984.tb00823.x
3. Kolodziejczyk, D. (2001). Sytuacja finansowa gmin jako czynnik rozwoju lokalnego (Financial Situation of Communes as a Factor of Local Development), *Samorząd Terytorialny*, No 12, s. 38-60.
4. Lowe, P., Murdoch, J., Ward, N. (1995). Networks in Rural Development: beyond Exogenous and Endogenous Models [in:] J.D. van der Ploeg, G. an Dijk (eds.), *Beyond Modernisation: The Impact of Endogenous Rural Development*, Van Gorcum, Assen, European Perspectives on Rural Development Series.
5. My Region, My Europe, Our Future, Seventh Report on Economic, Social and Territorial Cohesion, European Commission, (2017), Brussels.
6. Ploeg, J.D. van, Broekhuizen, R. van, Brunori, G., Sonnino, R., Knickel, K., Tisenkopfs, T., Oostindie, H. (2008). Towards a New Theoretical Framework for Understanding Regional Rural Development [in:] *Unfolding Webs: The Dynamics of Regional Rural Development* [electronic document] www.jandouwewanderploeg.com/2/EN/doc/Towards_new_theoretical_framework.pdf [accessed on 27.01.2013].
7. Pomianek, I., Drejerska, N. (2016). The Effects of Using Structural Funds at the Local Level - the Results of Qualitative Research among Project Beneficiaries, *Management of Sustainable Development in Rural Areas: at Local and Regional Scales*, eds. P. Borawski, I. Zuchowski, E.J. Szymanska, Ostrołęka: Wydawnictwo Wyższej Szkoły Ekonomiczno-Społecznej, pp. 75-85.
8. Poweska, H. (2016). Absorption of 2007-2015 EU Funding for Utilization of Cultural Assets in Rural Areas in Selected Voivodships of the Lowland Part of Poland, *Rural Development and Entrepreneurship: Production and Co-operation in Agriculture: proceedings of the International Scientific Conference, 9-11 May 2018, Jelgava, Latvia*, ed. Anita Auzina, Jelgava: Latvia University of Life Sciences and Technologies, pp. 259-266.
9. Poweska, H. (2018). Rural Areas of Poland as the Beneficiary of European Union Funding 2007–2013(15) for Cultural Projects, *Economic Sciences for Agribusiness and Rural Economy: proceedings of the International Scientific Conference, Warsaw, 7-8 June 2018*. T. 1, Warsaw, Warsaw University of Life Sciences Press, pp. 335-342.
10. Rakowska, J. (2016). Samorzady gmin jako beneficjenci polityki spójności Unii Europejskiej w latach 2007-2013 (2015) (Commune Self-governments as Beneficiaries of the EU Cohesion Policy 2007-2013 (2015)), Warsaw University of Life Sciences, Warsaw.
11. UN, 1992. Agenda 21. Action Programme, Rio de Janeiro.
12. UN, 2012. The Future We Want, accessed at <http://www.un.org/en/content/dam/secure-dam/asset-manager/documents/secretariat-policy/undocs/2012/70/70-102-20120909.pdf> on 31.08.2017.
13. UN, 2015. Transforming Our World: the 2030 Agenda for Sustainable Development, accessed at <https://sustainabledevelopment.un.org/post2015/transformingourworld> on 30.09.2016.
14. Ustawa z dnia 24 lipca 1998 r. o wprowadzeniu zasadniczego trójstopniowego podziału terytorialnego państwa, Dz.U. 1998, nr 96, poz. 603 (Law of March 8, 1990 on the Introduction of the Primary Three-tier Territorial Division of the State, *Journal of Law* 1998, No 96, item 603).
15. Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym, Dz.U. 1990, nr 16, poz. 95 (Law of March 8, 1990 on Commune Self-government, *Journal of Law* 1990, No 16, item 95).
16. Wojewodzka-Wiewiorska, A., Dudek, H. (2016). Dynamics Of Rural Areas Development in Poland - Convergence Analysis, *Research for Rural Development*, 2016, Vol. 2, pp. 99-105.

SMALL BUSINESS IN LATVIA – TRENDS AND FACTS IN FIVE YEARS

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Abstract. At the beginning of 2019, 141,812 active entities were registered in the Commercial Register maintained by the Register of Enterprises, the largest number of which are Limited liability companies (129,423), Individual Merchants (10,282) and other forms of business are much less represented. Based on the European Commission (EC) Regulation No. 800/2008, Annex 1, all enterprises are divided into groups - small (micro), small and medium enterprises (SMEs) and large enterprises. Based on official data, around 99 % would be in the category of small and medium-sized enterprises (SMEs). The breakdown of economically active SMEs by the Ministry of Economics is (Ministry of Economics, 2016): micro enterprises - 90 %, small enterprises - 9 %, medium enterprises - 1 %. The European Commission considers SMEs and entrepreneurship as key to ensuring economic growth, innovation, job creation, and social integration in the European Union. During the last five years, there have been significant changes in the principles, conditions and microenterprise regulations of microentrepreneurs. There are still many entrepreneurs in Latvia who are active and who employ a large number of all Latvian employees and companies contribute to the Latvian economy. Further analysis and research is based on the data of the last five years - regional ownership of enterprises, fields of activity, dynamics of revenue change, dynamics of the number of employees, age of enterprises. The aim of the research is to carry out the analysis of facts and trends observed in the activity of micro and small enterprises (MSe) in the last five years in Latvia. The research is based on official business data from several sources – the Register of Enterprises of the Republic of Latvia, the Ministry of Economics, official reuser of the data of the Register of Enterprises Ltd „Lursoft”, Central Statistical Bureau.

Key words: small business, microenterprises, economic activity 2013-2017 Latvia, significance of small and micro businesses.

JEL code: D43, E23, E24, M20, M21.

Introduction

In the context of national macroeconomic, companies are one of four economic agents (Gods, 2002), they build a model of macroeconomic flows. In its turn, the annual report prepared by the merchant is an indication of its economic activity or intention to be economically active in the future. Starting from year 2010, the number of companies submitting annual reports in Latvia exceeds 100 thousand. Although the number of registered subjects is higher, 141 812 active subjects have been registered in the Commercial Register at the beginning of 2019 by the Register of Enterprises. The number of submitted annual reports indicates that the decisions taken by the state institutions - the State Revenue Service and the Register of Enterprises regarding the liquidation of forced subjects have been correct. For example, in 2016, the Register of Enterprises excluded 8560 inactive companies from the register, and in 2015 there were 2165 inactive companies excluded from register. Thus, leaving registered entities whose decision is based on doing business. Limited liability company is the most popular form of business in Latvia and as of January 2019 it is 129 423, which is 91.26 % of all registered entities in the Commercial Register. The last finance reporting period for which data are reported is 2017, and that is 86.07 % of all 130 256 annual reports are made up of subjects - 110 785 micro enterprises and 1330 small enterprises. Small and micro enterprises play an important role in the Latvian economy. Significance is based on the large number of companies in Latvia.

The geographical concentration of Latvian residents in city Riga and the neighbourhood of Riga has been the basis for the majority of micro and small enterprises concentrated in the capital city of

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Riga, too. However, their role in the regions is increasing, allowing the population to develop their business, generate income for themselves and their families, create new jobs in the regions and employ more and more people. It is micro and small enterprises that help to ensure the existence of the Latvian economy. First and foremost, they create competition in the internal market and thus contribute to lower prices and the quality of products and services. Secondly, it is micro-enterprises and small businesses that are involved in supply chains and provide part of the production processes and raw materials of medium and large enterprises by supplying them with goods and/or services. Third, micro and small businesses are better able to adapt to different changes in consumer demand. And thanks to small and micro businesses, the middle class of the population and the improvement of the quality of life are ensured.

The aim of the research is to create a profile of micro and small enterprises in Latvia by analysing several parameters - number, financial turnover, economic activities and regional affiliation.

The research tasks are:

- categorize companies according to the set parameters;
- analyse the dynamics of the number of micro and small enterprises for five years (2013-2017);
- analysis of the regional breakdown and scope of economic activities (NACE);
- analysis of trends in turnover and number of employees in micro and small enterprises and research of trends for the last five years;
- to create the economically active micro and small enterprises summary, which provides impact on the Latvian economy.

The author puts forward the hypothesis that the quantitative number of micro and small enterprises, employment capacity, financial indicators have stabilized and do not show significant changes in the last five years. Thus, it is necessary to continue the study or research on the key influences of micro and small businesses.

This quantitative study is based on primary data sources - official variable data for micro and small enterprises in Latvia. The study will look at data and trends for the last five years, analysing data for 2013-2017. According to Article no.5 of the Law „Law on the Annual Financial Statements and Consolidated Financial Statements”, all companies are divided into micro, small, medium and large. The criteria set out in the law are different from the ones set out in Annex 1 to the European Commission (EC) Regulation No. 800/2008. The study was carried out according to the criteria set out in the Regulation for the classification of enterprises. One of the factors is the number of employees. Microenterprises include companies employing less than 10 employees and those employing small businesses employing between 11 and 49 employees. Turnover for micro-enterprises should not exceed EUR 2 million and for small businesses EUR 10 million. Balance sheet total, net turnover and average number of employees are indicators that merge merchants into a specific category - micro or small business.

The following research methods have been used for the research: quantitative data research approach, analytical study comparing data for five years and graphical method - visualization and analysis of visual information.

Research results and discussion

The analysis of the demographic situation of entrepreneurship is the basis for forecasting the duration of business creation, liquidation and the existence of companies in order to assess the impact on the economic growth and employment strategy indicators of a particular country.

According to the OECD (Organization for Economic Co-operation and Development) indicators, business demographic indicators are related to the registration of new companies, liquidation of enterprises, employment. The 2017 study on the establishment of new businesses shows that an increasing number of people who have decided to start their own business are involved in business. Likewise, Lursoft's study (Lursoft, 2018) shows that of all participants who registered a new company in 2017, in 61.10 % of cases the name of the person has not been found in the lists of other companies registered in Latvia. During the year, the number of such persons has increased, as in 2016 the share of participants who registered the first company was 55.79 % (Lursoft, 2018). The dynamics of the number of small and micro-companies that have submitted annual reports in accordance with the current laws and regulations in the author's research in the last five years show minor changes. The impact of small business on the national economy has recently been studied by researchers in Ukraine. The study concludes that small business could not provide a cumulative effect on productivity growth, which was observed in the sector of large and medium-sized enterprises, and vice versa — the dynamics of labour productivity in small business worsened the average for economy performance and has caused a decline in the real added value at 5.2 % of the base year (Kalchenko, Trusova, Hrybova, Serbii, 2018).

1. Regional breakdown of enterprises

The territory of Latvia is divided into five regions consisting of counties and cities. In 2009, following the Administrative territorial reform of Latvia completed in the country, Latvia has the following regions: Riga, Kurzeme, Vidzeme, Zemgale and Latgale. There is a very large concentration of business and population in Riga region in Latvia. The Riga region is located in the central part of Latvia and its centre is the capital of Latvia, Riga, which is internationally recognized as one of the most important metropolises in the Baltic Sea region. At the end of 2017, there were 704 476 inhabitants in Riga, which is 36.42 % of all 1,934 million inhabitants of Latvia. The map (*figure no.1*) shows that regions are similar in terms of area. Paul Bunt, Emeritus Professor of Entrepreneurship at the University of Bedfordshire Business School, UK, has said that „a small business is based on a man with his desire to work with his goals” (Bunt, 2016). It should also be taken into account that „the whole business is based on a person - as a client, as an employee” (Bunt, 2016), every business needs people, needs them near and on a regular basis.



Fig. 1. Regions of Latvia

The regional division of micro and small businesses shows (*Figure 2*) that there has been No significant change in any of the regions over the last five years. The largest number of micro and small companies that have submitted annual reports is in Riga region. In terms of number, it has

reached around 80,000 companies throughout the year, averaging 72.3 % of all micro and small businesses in Latvia. In other regions, the number of companies does not exceed 8 % of all micro and small enterprises in Latvia. Which shows very high concentration of micro and small companies in Riga and Pieriga. The average number of companies in the Kurzeme region is 8773, at the end of 2017 it is 7.89 % of all micro and small enterprises. In Latgale and Vidzeme, a very small number of changes in the number of 5 years, which fall within 0.2 %. And only in Zemgale, there is an increase in the number of companies, which in the five-year period represents an increase of 0.3 % at the end of 2017, 8149 companies have been registered in Zemgale region.

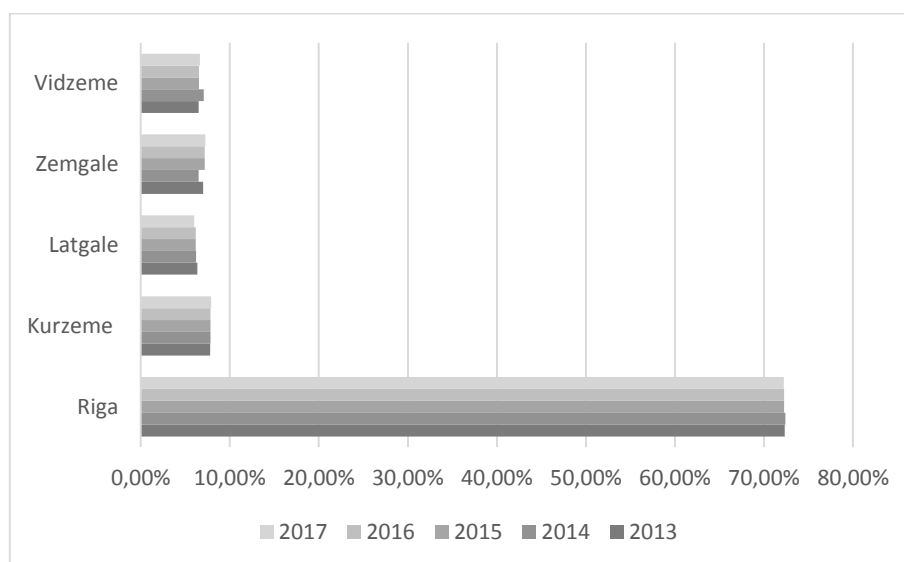


Fig. 2. **Micro and small enterprises regional breakdown, 2013-2017, % from all MSE**

Micro to small businesses are very important for the Latvian economy in quantitative terms. Between 2013 and 2017, these companies account for an average of 86.74 % of the total number of annual reporting companies. The calculation is based on the data analysed below.

Table 1

Annual Financial Statements (AFS) count

No		2013	2014	2015	2016	2017
1.	Total number of AFS	123846	128646	130935	131273	130256
2.	Micro, small enterprises (MSE) AFS	108401	112220	113328	113332	112117
3.	% MSE AFS from all	87.52 %	87.23 %	86.55 %	86.33 %	86.07 %

The study shows that significant changes are not felt even though several activities to support entrepreneurship have been undertaken at national level since 2007. The first activities were carried out during the planning period 2007-2013. The next support activities are for 2014-2020. planning period. Support activities included the following support activities: investment in the creation or reconstruction of industrial premises, training of employees to promote competitiveness, start-up of business and development of small and small enterprises in specially supported territories. In order to promote business development in the regions, in the begin of 2018, the government supported amendments to the Regional Business Incubator and Creative Industries Incubator Support Program, specifying the conditions for the use of co-operative premises in business incubators, the organization of business promotion activities, and the publicity of project information. The results of this activity can only be evaluated from 2020 onwards. On the basis of the data, it has to be concluded that micro

and small enterprises have not experienced such state support within the last five years that would have reached the set goal - development of regional business.

2. Business activities (NACE 2.0)

By NACE Rev. 2, the scope of all enterprises is divided into 21 top-level headings, marked by letters. Micro and small businesses operate for 19 of them. Considering that micro and small enterprises make up the majority of the total number of Latvian companies, it is only natural that the most popular business sector among these companies is the same as the most popular business area in Latvia.



Fig. 3. TOP 6 MSe economic activities for five years

In the study, the author analysed all 19 areas of activity by NACE 2.0 classification. The data analysed show that almost one fifth or 20.9 % of all micro and small enterprises in Latvia associate their core business with retail or wholesale (except cars and motorcycles). Other areas of activity are TOP 6. Each of them operates from 7 % to 9 % of all micro and small businesses. TOP 6 is the second most popular field of activity - construction (10426 companies on average), followed by real estate activities (9657 companies). Among the most widespread industries in which Latvian micro and small companies are most likely to operate, accounting and legal services, accommodation and promotion services and activities in the areas of electricity, gas, heat and air conditioning are also mentioned. And this analysis of data also shows a stabilization in the scope and a slight change in their structure over the last five years.

3. MSe Analysis of Turnover

European Commission (EC) Regulation No.800/2008 Annex 1 also sets the total turnover or balance sheet total to 2 million EUR and up to 10 million EUR. However, a very large number of micro and small businesses show that their sales revenue (turnover) is 0 and they practically do not participate in the macroeconomic flow. These companies do not participate in economic activity during the period under review (Hofs, 2002). However, the financial report submitted largely indicates the intention of the owners to operate in the future. It should be noted that the breakdown of enterprises is based on the financial data submitted for the previous period. Because it is quite clear that only through cash flow generation can the company be able to employ employees, provide

production or service. And in this case, it is not even a question of analysing other factors that could cause a crisis in the company (Rurane, 2002). The Table 2 shows the number of micro and small enterprises, which in the period of 2013-2017 had No turnover for the year (turnover was 0 EUR).

Table 2

Companies with turnover 0 EUR

No	Indicator	2013	2014	2015	2016	2017
1.	Number of companies (info AFS)	26443	27130	26066	32429	24937
2.	% of all companies (info AFS)	24,4 %	24,2 %	23 %	28,6 %	22,2 %
Average in 5 years (count/ %)		27401/24,5 %				

The remaining companies were divided into several turnover groups by the author. The second group from 1 to 12K has been selected for analysis. Thus, a micro-enterprise can theoretically provide services with such turnover for one employee approaching the average wage calculated in the country. The third group has a turnover of 12K – 50K, the fourth group 50K – 100K, the fifth 100K – 2M, the sixth 2M – 10M, the seventh - more than 10M EUR.

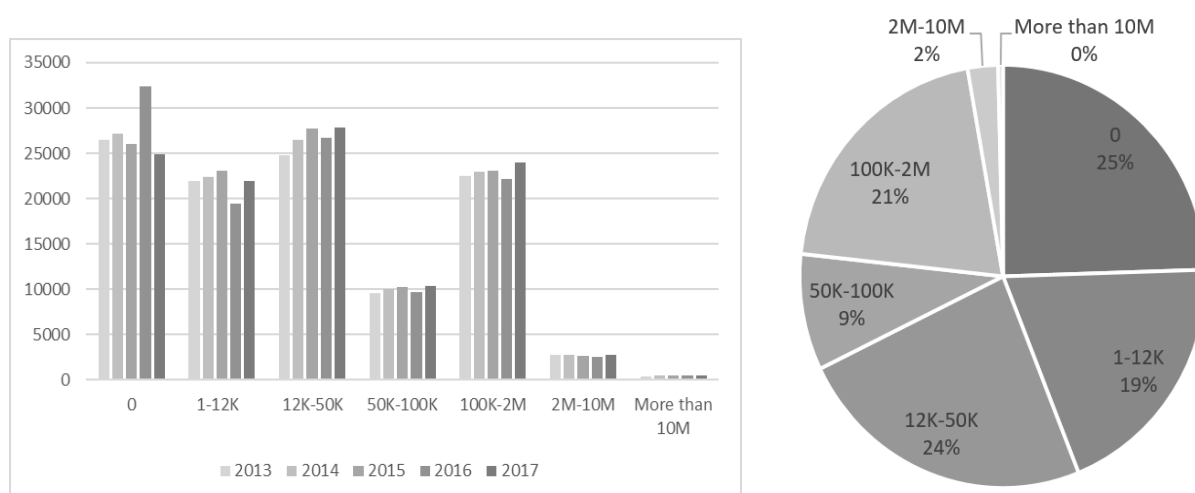


Fig. 4 and 5 **MSe turnover breakdown in 2013-2017**

The analysis shows that in the last five years in Latvia stabilization of the turnover of enterprises has been observed. A significant increase (compared to 19.62 % in 2015 compared to 2016) is seen in the number of companies with a turnover of 0 EUR. In 2017, however, it returns to previous levels. This can be explained by changes in the law on micron tax payers, the registration of these companies, but not the initiation of active activities. Decisions taken by state institutions (State Revenue Service and Register of Enterprises) regarding the forced liquidation of subjects. While new businesses are becoming more cautious, the number of liquidated companies has continued to grow rapidly in 2017, rising by 34.78 % over the year to 16479. It should be noted that the number of companies liquidated last year has been the highest in the last 26 years. Returning to a normal state is a sign of improving the business environment for micro and small businesses by eliminating „empty“ companies.

4. Employment in MSe

Employment is a fundamental economic problem that leads to widespread social resonance (Gods U., 2002). By definition, micro and small businesses employ between 1 and 49 employees. The research has carried out a study on the average number of employees in the company and changes in the number of employees in the five-year period. Analysis of the number of employed in Latvia

from 15-74 years for the period 2013-2017. The year 2010 shows a direct correlation with employees in micro and small enterprises.

Table 3

Dynamics of the number of employees

No	Indicator	2013	2014	2015	2016	2017
1.	Employed aged 15-74 in Latvia	894 000	882 800	896 100	893 300	894 800
2.	Employed in MSE	466 283	478 396	481 060	438 174	454 532
	Ratio %	52 %	54 %	53 %	49 %	51 %

On the basis of data of the Central Statistical Bureau of Latvia and the analysis of the submitted annual report, the author concludes that there is stability in employment as well as No significant changes. In all years, around half of the employees are employed in micro and small businesses. This statement might change slightly after a more detailed analysis, as quantitative data in the company's financial statements have been taken into account for the analysis. The number of employees does not exclude the same employee in several companies.

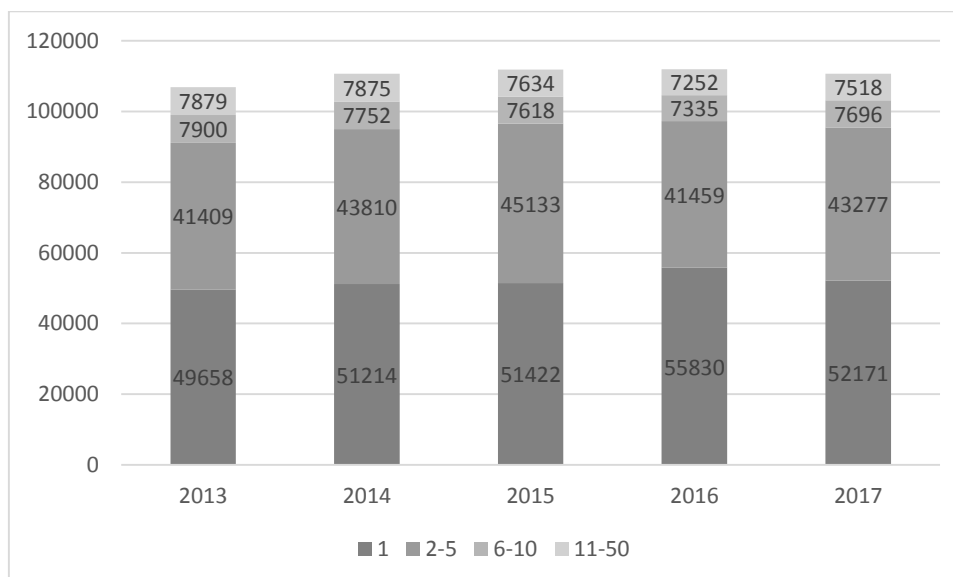


Fig. 6. Number of employees in MSE

The author has divided all the micro and small businesses into groups according to indicator that shows how much the company employs employees. Figure 6 shows that there are most micro and small businesses that employ 1 employee. In 2016, the number of such companies is the highest, but according to the acquisitions by public authorities, this number has decreased in 2017. There are still a lot of companies employing 2 to 5 employees, so the author argues that the support of micro and small businesses is the most indispensable for these companies, and this will also affect national employment.

Conclusions, proposals, recommendations

- 1) The study confirms the hypothesis that the number of micro and small enterprises, the employment capacity, the financial indicators have stabilized and do not show significant changes over the last five years. Thus, the author has a reason to conduct a study or research on the key influences of micro and small businesses (e.g. process management).
- 2) The study allows us to conclude that without changing the rapidly regulating norms, there are about 60 thousand economic assets in Latvia (with a turnover exceeding EUR 12 000).

- 3) There is a very high concentration in Riga and Pieriga, where there are over 70 % of all micro and small enterprises. In other regions, the number of companies does not exceed 8 % in each region. This is dangerous for regional development.
- 4) In the study, the author analysed the areas of activity in which businesses operate MSe. As a result, the author has selected TOP 6 areas of activity for micro and small enterprises in Latvia that do not show significant changes over the last five years.
- 5) All MSe can be divided into 6 parts according to their turnover. There is a tendency to have a large number of companies with No financial turnover (around 27K companies on average) throughout the years. Companies with a turnover below 12K EUR are about 21K. The author concludes that only about 60 thousand companies give a financial contribution to the Latvian economy.
- 6) MSe mostly employ one person, who is usually the owner and the member of the board too. But there are also many companies employing between 2 and 5 employees (around 43K micro and small businesses).
- 7) In the study, micro and small enterprises have shown stability over the analysed criteria over the last 5 years - number dynamics, regional breakdown, financial turnover and number of employees.

Bibliography

1. Bunt, P. (2016). Entrepreneurship and small business Start-up, growth and maturity, 2016, No 1, pp.42, 198.
2. Caune, J., Dzenns, A. (2009). Startegiska vadisana, 2016, No 3, pp.69, 80.
3. Gods, U. (2002). Makroekonomika, 2002, pp.17.
4. Hofs, K.G. (2002). Biznesa ekonomika, 2002, pp. 24, pp.275.
5. Kalchenko, S., Trusova, N., Hrybova, D., & Serhii, B. (2018). The small and large business interaction within national economy's gross added value reproduction in Ukraine. *Oeconomia Copernicana*, 9(3), 403–417. doi: 10.24136/oc.2018.020
6. Kroplijs, A., Rascevska M., (2010). Kvalitativas petniecibas metodes socialajas zinatnes, pp.20.
7. Rurane, M. (2002). Uznemejdarbibas organizacija un planosana, pp.130, pp.321.
8. Law on the Annual Financial Statements and Consolidated Financial Statements. Gada parskatu un konsolideto gada parskatu likums. Latvijas Vestnesis, 222 (5540), 12.11.2015. Retrieved: <https://likumi.lv/ta/id/277779-gada-parskatu-un-konsolideto-gada-parskatu-likums> Access:12.11.2015.
9. Business Environment Review by Ministry of Economics (2015). Retrieved: https://www.em.gov.lv/lv/nozares_politika/nacionala_industriala_politika/uznemejdarbibas_vidē/. Access: 13.06.2017.
10. A description of the business incubator support program for business promotion in the regions has been specified (2018). Retrieved: <http://www.liaa.gov.lv/lv/aktualitates/uznemejdarbibas-sekmesanai-regionos-precizeta-biznesa-inkubatoru-atbalsta-programma>. Access: 18.01.2018.
11. Employment and unemployment Central Statistical Bureau of Latvia publication (2018). Retrieved: <https://www.csb.gov.lv/lv/statistika/statistikas-temas/socialie-procesi/nodarbinatiba>. Access: 22.02.2019.
12. Average monthly and median wages and salaries (2013-2017). Retrieved: http://data1.csb.gov.lv/pxweb/lv/sociala/sociala__dsamaksa__ikgad/DSG010.px/?rxid=f15af91d-605e-4b12-b3e3-4e30ce2715ca Access: data available in an online database starting with 1990
13. Business demography indicators by kind of principal activity by statistical regions (2013-2017). Retrieved: https://data1.csb.gov.lv/pxweb/lv/uzn/uzn__uzndarb/SBG070.px Access: data available in an online database starting with 2007
14. Lursoft study: Micro and small enterprises play an increasingly important role in the Latvian economy (2013). Retrieved: <http://blog.lursoft.lv/2013/05/30/lursoft-petijums-mikro-un-mazie-uznemumi-latvijas-ekonomika-ienem-aizvien-nozimigaku-lomu/> Access: 30.05.2013.
15. Statistics Number of annual reports recorded (2019). Retrieved: https://www.lursoft.lv/lursoft_statistika/?&id=62. Access: data available in an online database starting with 1997

AXIOLOGICAL FOUNDATIONS OF SILVER ECONOMY IN RURAL AREAS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT IN POLAND

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Abstract. The paper presents the concept of sustainable development adopted by the United Nations in 1987, with its foundations contained in the Enlightenment and Kant's philosophies of designing rational social development. It was stressed that successful social development is the responsibility of future generations. Fundamental humanistic, social and natural values were described as those realized as objectives of the concept of sustainable and multifunctional development of rural areas in Poland. The study also emphasized the need to involve older people from the rural environment in the implementation of these concepts in their place of residence. One of the forms of such an activity of seniors is silver economy in the commercial and non-commercial aspects.

Keywords: sustainable development, rural areas, values, senior citizens, silver economy.

JEL code: Q01, R11.

Introduction

Rural areas in Poland are situated outside the administrative borders of cities and cover about 93 % of the country's area. They are the largest beneficiary of support from the EU funds aimed at improving the standards of living of their inhabitants. The support contributes to the implementation of numerous investments in the field of road infrastructure, cultural infrastructure, and environmental protection. Rural residents appreciate the benefits of the natural values of the area they live in, lower costs of living, greater safety and attractiveness of the place of residence (Informacja na temat, 2017). In 2016, 40 % of the country's population lived in rural areas, of which about 20 % were people in pre-working age, 60 % in working age and about 20 % in post-working age (Polska wies 2018, 2018).

The basis for the functioning of agriculture in Poland are family farms, with their number reaching about 1,600 thousand. The average area of the farm is 9.6 ha. In addition to agriculture, which is an important sector of the rural economy, non-agricultural activities in rural areas are developing intensively. This activity constitutes the basis for a multifunctional rural development strategy, which does not only diversify the rural economy and introduces new economic functions, but it also activates inhabitants to develop non-agricultural activities based on the resources of natural environment and rural culture (Stanny, 2013). The strategy is primarily aimed at limiting agriculture, creating new job opportunities in rural areas, reducing unemployment rate, developing local entrepreneurship and social and technical-utility infrastructure in rural areas.

Societies of Poland and other European countries are undergoing the process of ageing, which is caused, among other things, by prolonged life expectancy and low total fertility rates. At the end of 2017, the population of Poland amounted to 38.3 million, including over 9 million people aged 60 and over, which accounted for about 24 % of the population. In rural areas, residents over 60 years

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of age constituted 20 % of the country's population, of whom 43.2 % were men and 56.8 % were women (Informacja o sytuacji, 2018). Estimates of the Central Statistical Office (GUS) in the demographic forecast for 2014-2050 indicate that in rural areas, the percentage of the working age population (men aged 18-64, women aged 18-59) will be decreasing from 63.4 % in 2014 to 50.8 % in 2050. Furthermore, the percentage of the population at the post-working age (men aged 65 and over, women aged 60 and over) will be increasing from 16.2 % in 2014 to 34 % in 2050 (Polska wieś 2018, 2018).

At present, seniors are a generation born mostly during the post-war baby boom in 1945-1959, chiefly in the countryside. It is a „baby boom generation”, whose lives and abilities to satisfy their needs are determined by the common economic and institutional context, reflecting the socio-economic history of the times in which these people studied, worked, started families, and participated in the social security system (Szatur-Jaworska, 2018). The baby boomers' generation is a generation that, at the threshold of old age, belongs to families in which four generations live at the same time. It has duties both towards older parents and their own grandchildren. Since families in Poland occupy a very high position within the value system, this generation is an important source of support and assistance. This is why old parents expect help from their children, whereas adult children (mostly women) feel obliged to provide it and consider it as something natural (Walkowska, 2018).

There is therefore an important need to implement the concepts of active ageing, healthy ageing, also termed successful or positive ageing. This concept aims to optimise active life of older people towards to ensure the best possible quality of life, its improvement and making it as long as possible. This process is expected to be accompanied by humanitarian values and the need to develop the so-called „silver economy”, supported by the values of health, culture, support, material security and activity. Successful ageing, with good mental and physical condition, good health and financial independence, means less of a burden not only on public finances, but also on their adult, already ageing children (Rowe, Kahn, 1998). It also promotes sustainable social development of towns and villages.

The first part of the paper formulates the hypothesis that the concept of sustainable social development presented by G.H. Brundlandt at the United Nations in 1987, in the *Our common future* report is situated in the Enlightenment and Kant's traditions of social philosophy, especially as an idea of „practical reason”. The view that this concept invalidates the liberal position of A. Smith on the formation of „spontaneous social order” and a view on minimizing the role of the state in the management of social development was justified. The second part presents a typology of fundamental values for sustainable social development: 1. humanistic values, including 'supra-egocentric' values (good, truth, love, honesty), the value of the human person and seniority, these two values are presented for the first time in literature; 2) the social values contained in the „Report”, i.e. sustainable development of modern civilization, solidarity, responsibility; 3) natural values, i.e. balance and biodiversity, the value of land, sky, mortal beings, i.e. people. These values were adopted from the philosophy of M. Heidegger. The paper presents the results of empirical research devoted to the realization of the values of seniority in the development of silver economy in rural areas consistent with sustainable development.

The views and analyses contained in the paper have a cognitive and practical status because the conclusion part indicates the tasks of the state and self-government administration concerning the implementation of the objectives of silver economy, consistent with the sustainable and

multifunctional development of rural areas. The paper was written based on the analysis of various literature sources on the subject, data collections of social statistics, political documents, and reports from surveys.

Subject of research in literature

At the end of the eighties of the last century, G.H. Brundlandt, Prime Minister of Norway, presented a report *Our Common Future* in the UN (1987) in which she formulated a political and at the same time civilisation-centred concept of *sustainable development*. The report's author adopted a broad concept of development identical with the concept of civilisation. She stated that „at the present level of civilisation, sustainable development is possible, i.e. development in which the needs of the present generation can be satisfied without diminishing the chances of future generations to satisfy them” (*Nasza wspólna*, 1991).

Two issues should be emphasized in relation to the quoted statement: The first is the combination of current policy with a civilisation mission. This broad understanding of development expresses holistic thinking, which is the basis for the formulation of many sustainable development objectives. The second issue is the acceptance of ethical rather than merely economic responsibility for future generations, the responsibility of those of us living today to maintain a world that will be suitable for living of the generations to come. The responsibility of people understood in this way is based on the Kant's ethics of obligation, duty and responsibility.

The concept of sustainable development of modern civilization is in opposition to neoliberalism and global capitalism. It rejects A. Smith's classic view of the formation of a „spontaneous social order”, a view accepted by all neoliberals. It assumes the restoration and stabilisation of the state's power, which is able to coordinate, as the only entity, the achievement of sustainable development objectives by various actors, including business entities. It will therefore be a rationalised development rather than a result of uncoordinated actions.

We believe that the concept of sustainable development is an idea formulated similar to the Kant's „practical reason”^{*} and is connected with the Enlightenment tradition. It is well known that the Enlightenment accepted the Cartesian view that reason is not an autonomous authority in relation to the world, but it plays a cognitive-valuating role and designs social life based on critical cognition of people's experience.

In the Enlightenment, according to this Cartesian view, many so-called social utopias were written and published as a remedy for the then unjust social relations. Utopias have gone down in history. Kant's views continue to inspire contemporary social philosophy and politics. It should be remembered that based on the famous Kant's dissertation „*On Eternal Peace*”, the concept of a united peaceful Europe was formed after World War II. The philosopher wrote that „peace must be somehow created”, first in human thought as a project, and then it is realized (Kant, 1992). He believed that politics means „the art of governing people... and (it is) practical wisdom, (Kant, 1992), which should lead to a state in which everyone would be content” (Kant, 1992). Kant wrote that the idea of practical reason is „most fertile and necessary for real activity”, so it must be given *in concreto* and not in the form of abstraction detached from life (Kant, 1986). Kant stated that „such ideas of practical reason

^{*} Defining the concept of sustainable development as the Kant's idea of "practical reason" was suggested in the paper: W. Kaczocha, J. Sikora, *Aksjologiczne aspekty zrównowoczonego rozwoju w ujęciu teoretycznym i empirycznym*, [Axiological aspects of sustainable development in theoretical and empirical approach] (in:) *Journal of Agrobusiness and Rural Development*, No. 1 (19), Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu, Poznań 2011.

demonstrate their causality in relation to human activities" (Kant, 1986), when they reach the consciousness of intelligent people who want to overcome the chaos in social life and want to design and realize the present and the future in a rational way. We are of the opinion that the objectives and principles of sustainability contained in the Brundlandt's report are concrete in that they set out specific actions to be taken in politics, the economy, the protection of nature, life and human health. All the constitutions of democratic European countries contain appropriate provisions obliging individual political, economic and social entities to implement sustainable social development. Thus, the objectives and principles contained in the concept of sustainable development have become the causes of the subjective and objective activities. The Constitution of the Republic of Poland stipulates that „1. Public authorities shall adopt a policy to ensure environmental security for present and future generations" (Konstytucja, 1997). In the *Environmental Protection Law*, sustainable development is defined as „socio-economic growth in which political, economic and social activities are integrated with the preservation of natural balance in order to ensure satisfaction of basic needs of particular communities, both present and future generations" (Ustawa, 2001).

In Poland, similar to other European countries, few authors have addressed axiological issues of sustainable development. They have only analysed selected problems of values. In Poland, Tadeusz Borys (Borys, 2016) presented a thorough study on the fundamental values of sustainable development. This researcher wrote that „Dissemination of an supra-egocentric approach to development would be extremely beneficial, primarily for the reinterpretation of the category of the progress of civilization by basing development on stable foundations - key „warm" axiological values such as: good (unconditional good), truth (unconditional truth), love (unconditional love), empathy (unconditional empathy), honesty (unconditional honesty)" (Borys, 2016).

These values are considered by the author to be the „axiological foundation" of sustainable development (Borys, 2016). In our opinion, these values have a humanistic status. These fundamental values also include the value of the human being, including the value of seniority or being a senior. This value, we believe, has been marginalised and even invalidated in contemporary culture, which puts emphasis on the value of youth (i.e. being a young person). It can be stated that the value of youth dominating in mass culture is egocentrically oriented, it is directed towards itself and not towards others, and it prefers to be an independent individual. It should be noted that the value of the human being as the subject of one's own life and the subject of social life is developed in neo-thomistic philosophy (K. Wojtyła, 1982).

The fundamental values of sustainable development include the social values mentioned in the *Report*: sustainable development as a value for the civilization, the value and at the same time the norm of responsibility of the current generation and individual persons for the development of generations to come, the value and norm of solidary cooperation of people in the implementation of sustainable development. Obviously, the fundamental values of sustainable social development include natural values, referred to in the *Report* as „ecological balance, biodiversity", which, like all values, should be respected in people's consciousness and realized in practice, especially in business activity.

With reference to the philosophy of M. Heidegger, fundamental natural values include the Earth, the sky and people as mortal beings. The philosopher wrote in the book *Building Dwelling Thinking* that the essence of living on earth is to „keep a simple quadrilateral" in a dwelling, designated by „Earth and Heaven, Divine Beings and the Mortals" - mortal people live „by dwelling a quadrilateral". The preservation of the quadrilateral, living in it, among things, by actions and according to the

values assigned to its particular corners, is vested only in man. Only human is in the quadrilateral of these values (Heidegger, 1977).

Developing Heidegger's thought, one can say that the values of the quadrilateral constitute the existence of a human in the dwelling, in the world and in culture. We live on earth, we have heaven above us, we are mortal, but do we believe in God Beings? A quadrilateral in a dwelling consists of corners to which values are attached. The two corners, with the values of earth and heaven, determine our earthly existence, but also make us think, especially to people who believe in a religion, of Divine Beings, in which they see their transcendence. Religious people, connected with earth and heaven, recognize the transcendent being in Divine Beings, with which they wish to unite after death (Zych, 2013). Heidegger seems to say that non-believers are devoid of transcendent thinking, but this is their sovereign decision.

Using Heidegger's language, one can say that the quadrilateral of values exists „here“, in a limited space of a house, in the space of a dwelling; at the same time, it also exists „in the world“ outside the house, in the space „inside the world“ (Heidegger, 1997).

In modern culture, people often reject the values of the quadrilateral or forget that they exist. Then, the being, as a whole determined by the values of the quadrilateral is, using the Heidegger's notion, „covered“. People perceive only fragments of existence depending on their life's situation, determined by their instrumental roles performed at work and in social life. Consequently, these values are treated instrumentally (utilitarian) in the economy, politics and social life.

The adopted basic values of sustainable social development are conducive to the development of the natural and economic spheres in which older people live in rural (and also urban) areas. These values can also be found in European documents concerning the problems of older adults (WHO, 2004; GUS, 2016). Humanistic values are dominated by the following values: good, love, honesty, human dignity, seniority. The socio-economic values include solidarity, trust, cooperation, responsibility, work, capital. The natural values include land, climate, air, flora and fauna. These values form a fundamental basis for sustainable development of rural areas, agriculture and non-agricultural activities. They correspond to the basic factors of economic development, i.e. land, labour, capital. They are close to the values adopted by M. Heidegger. Their implementation in practice is supported by the conditions presented in the concept of practical reason by E. Kant. They form the basis for a supra-egocentric approach to the sustainable development of rural areas, with the value of seniority and dignity of older people deserving special recognition in silver economy.

Results and discussion

The complementary values presented in this part of the paper are close to older adults living in rural areas. They represent the basis for the development of silver economy as an example of successful ageing of the rural population. Silver economy is an economic system aimed at using the potential of older people, taking into account their needs. Like any other economy, silver economy is characterised by a demand-oriented and supply-oriented approaches. The generation of older adults has its own specific needs, which require the development of activities and services of different companies and institutions (demand side). On the other hand, older adults have a specific human and social capital which can be used and managed to increase their professional, economic and social activity (Golinowska, 2011) (supply side). The concept of silver economy does not approach the ageing of the population as a threat, but rather as a challenge and an opportunity to achieve economic growth and improve economic competitiveness. Its overriding goal is to improve the quality

of life of older adults, stimulate economic activity to meet the needs of these people and create job opportunities for their employment. Such an approach contributes to raising awareness in society, exchanging experiences, shaping a positive image of older people, building solidarity between generations.

An important element of silver economy is the so-called 'white jobs', the development of the care and health services sector for older adults and matching of vocational training programs with the needs of the labour market. Various possibilities of creating incentives for social activity, civic participation, development of voluntary work for the elderly and acting as leaders in the local environment are also important. Developing the valuable potential of seniors, their knowledge, skills, professional and life experience and willingness to work for the benefit of others is one of the key challenges of senior policy (Zalozenia Dlugofalowej, 2014). Therefore, silver economy has two dimensions: Commercial and non-commercial. Realization of silver economy should include not only older adults but also entrepreneurs, business partners, administration, politicians, local entities and the non-profit sector. Unfortunately, neither the labour market today nor most segments of the economy are yet oriented towards exploiting the potential of the older generation in the urban and rural environments.

Silver economy in rural areas can support a strategy for the sustainable and multifunctional development of these areas. The implementation of silver economy in rural areas should take into account the social context of values functioning in the local community, since silver economy in terms of supply is mostly run by family businesses, including family farms. The family is the owner, manager and, at the same time, the staff of the company providing work. It is a place where direct, often emotional ties are established in order to satisfy the needs of family members or the closest community. The culture of work is based on basic norms of social coexistence, e.g. the norm of respect for the values and personal dignity of older people; the norm obliging to respect their health; the norm recommending the role of a „reliable carer”; the norm recommending respect for cultural goods, traditions and natural assets (Sikora et al., 2015). The realization of the values of sustainable social development, development of silver economy (humanistic, social and natural values) is accompanied not only by the above mentioned formal and moral norms (non-formalised) but also by the knowledge, life experience and professional experience of seniors.

The development of silver economy in terms of demand in rural areas is very welcome. However, the problem requires a separate study. A supply-side silver economy based on the axiology of seniors and the value of seniority developed in rural areas supports the sustainable social, economic and natural development of these areas (Skowroński, 2003).

Opportunities for its development are provided by elderly people, who mostly live with their families running agricultural farms (46 %) (Informacja o sytuacji, 2018). They support the household budget by receiving a pension and assistance in performance of agricultural and non-agricultural activities in the household. It should also be added that among senior citizens in 2016, 13 % had their own farms and 4.4 % were self-employed in non-agricultural businesses. The potential of support for family farms by seniors living in rural areas is substantial and diversified. A significant part of these farms derive incomes from non-agricultural sources and from additional gainful activities based on working in agricultural farms (Table 1, 2). Therefore, the chances of development of commercial silver economy in the supply aspect in rural areas in Poland are significant. Unfortunately, No detailed research has been done in Poland into this subject.

Table 1

Individual agricultural farms with non-agricultural incomes in Poland

Specification	Total			
	2005		2016	
	thousand	%	thousand	%
Total farms	1723.9	100.0	1398.1	100.0
Total farms with non-agricultural income	1317.4	76.4	1149.0	82.2
- from non-agricultural business activities	159.1	12.1	213.0	18.5
- from paid employment	692.5	52.5	668.3	58.1
- from a pension	668.6	50.7	462.1	40.2
- from other non-gainful sources	75.2	5.7	106.3	9.0

Source: *Polska wieś 2018, (2018), Raport o stanie wsi, (Polish countryside. Report on the state of rural areas) ed. J. Wilkin, I. Nurzyńska, Wydawnictwo Naukowe SCHOLAR, Warsaw, p. 124.*

The analysis of the above data shows that in 2005 and 2016, the percentage of households obtaining income from non-agricultural sources increased from 76.4 % in 2005 to 82.2 % in 2016 (Table 1). In general, apart from the decreasing source of non-agricultural income from pensions, other sources of non-agricultural income by agricultural farms increased in the analysed years. Additional incomes in 2005 and 2016 from gainful activities based on the agricultural farms are presented in Table 2.

Table 2

Households with additional gainful activity based on an agricultural farms in Poland

Specification	Total			
	2005		2016	
	thousand	%	thousand	%
Number of households	1723.9	100.0	1398.1	100.0
Total farms with gainful activities	107.1	6.2	39.7	2.8
- agritourism	8.2	7.6	10.6	26.7
- handicraft	1.7	1.6	1.4	3.5
- processing of agricultural products	4.4	4.1	2.6	6.5
- production of renewable energy	0.3	0.3	0.4	1.0
- aquaculture	12.1	11.3	0.9	2.2
- agricultural contract work	28.9	27.0	3.8	9.6
- other activities (e.g. trade)	57.6	53.8	21.8	55.0

Source: *Polska wieś 2018, (2018), Raport o stanie wsi, (Polish countryside. Report on the state of rural areas) ed. J. Wilkin, I. Nurzyńska, Wydawnictwo Naukowe SCHOLAR, Warsaw, p. 124.*

The analysis of the presented data shows that in 2016, compared to 2005, the percentage of farms with gainful activity based on the resources of agricultural farms decreased from 6.2 % in 2005 to 2.8 % in 2016 (Table 2). This situation does not apply to agritourism, handicraft, processing of agricultural products (mostly based on regional cuisine traditions), production of renewable energy and other activities. The reasons for this state of affairs can be found primarily in the progressing industrialization of agriculture and dwindling labour resources of agricultural families, especially those based on family members of working age. These people are looking for a well-paid job outside the farm, also abroad. Therefore, they reduce the interest in additional gainful activity in agricultural farms (Polska wieś 2018, 2018).

However, it is worth emphasizing that the development of additional gainful activity based on the resources of agricultural farms, such as agritourism, handicraft and processing of agricultural products, is combined with assistance and support for this activity by older adults, especially women.

Consequently, they help develop rural tradition and a folk culture with a growing demand, especially from tourists (Sikora, 2012).

In addition to the supply aspect of silver economy in commercial terms in rural areas, attention should be paid to its non-commercial aspects (the non-profit sector). An example of this approach are some elements of social capital in Polish rural areas, especially social work of older adults in civic organizations. In 2016, people aged 60 and over in rural areas accounted for 19 % of the total number of artistic groups and ensembles. Of them, 35 % were members of vocal and folklore groups and choirs, and 54 % were members of rural housewives' clubs. It is worth noting the significant percentage of people aged 60 and over among graduates of computer courses (54 %) organized in rural areas (Informacja o sytuacji, 2018). Social activity of seniors in the Polish rural areas is wide. Many older adults are active not only within formal and registered organizations, but also devote themselves to social activity in informal entities operating in schools, religious groups, village councils, and self-help activity. Unfortunately, there No detailed research has been done into this problem. However, one can propose a thesis, which would require a deeper verification, that the level of social capital in rural areas among seniors, measured by reluctance to joint action, small degree of self-organization and lack of social trust, is not low and it is an important factor for silver economy (commercial and non-commercial) and sustainable social development of rural areas in Poland.

Conclusions, proposals, recommendations

Based on the characterization of the empirical research results, their discussion and analysis of the literature, the following general conclusions can be formulated:

- 1) The goals of sustainable development, including rural areas, should be supported by humanist values, including the values of seniority and dignity of older adults. The value of seniority should be recognised in social and economic life and in the political decisions of central and local authorities oriented at rural development.
- 2) The realization of the idea of sustainable and multifunctional development of rural areas is connected with the need to adopt the value of community and the concept of successful ageing of the rural population.
- 3) Silver economy in rural areas in Poland in terms of demand and supply, targeted at commercial and non-commercial goals, has great opportunities for development. This economy is supported by humanistic, social and natural values rooted (or remaining to be rooted) in the present generation of older adults.
- 4) As a consequence of demographic change, silver economy in rural areas must be taken into account in public policy towards older people, at central, regional and local levels. The areas of this policy include: financial standing of older adults living in rural areas, social assistance, health care, professional and social activity, intergenerational solidarity, promotion of the value of seniority.

References

1. Borys, T. (2016). *Aksjologiczne podstawy zrównowoczonego i inteligentnego rozwoju (Axiological aspects of sustainable and intelligent development)*. *Ekonomia i Środowisko*, 2016; 3, pp. 52-59.
2. Golinowska, S. (2011). *„Srebrna gospodarka” i miejsce w niej sektora zdrowotnego. Koncepcja i regionalne przykłady zastosowania („Silver Economy” and its place in the health sector. Concept and examples regional application)* *Zdrowie Publiczne i Zarządzanie* 2011; Vol. 1, pp. 76-85.

3. GUS. (2016). *Wpływ zmian demograficznych i starzenia się społeczeństwa na organizację systemu ochrony zdrowia i Narodowego Programu Zdrowia (Effect of demographic changes and ageing of the society on the organization of the health care system and the National Health Programme)*. Warsaw.
4. Heidegge, M. (1977). *Budowac, mieszkac, myslec. Eseje wybrane (Building, Dwelling, Thinking: Selected essays)*. PWN, Warsaw.
5. *Informacja na temat sytuacji na obszarach wiejskich i w rolnictwie (Information on the situation in rural areas and agriculture)* (2017). Ministerstwo Rolnictwa i Rozwoju Wsi. Departament Programów i Analiz. Warsaw.
6. *Informacja o sytuacji osób starszych w Polsce za rok 2017 (Information about older adults in Poland in 2017)*. (2018). Ministerstwo Rodziny, Pracy i Polityki Społecznej. Warszawa, ss. 8, 54.
7. Kaczocha, W., Sikora, J., (2011). *Aksjologiczne aspekty zrównowzonego rozwoju w ujęciu teoretycznym i empirycznym. (Axiological aspects of sustainable development in theoretical and empirical approach)*. (in:) Journal of Agribusiness and Rural Development, nr 1 (19), Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu, Poznan 2011, ss. 98-102.
8. Kant, I., (1986). *Krytyka czystego rozumu, (Critique of pure reason)*, t. II, PWN, Warszawa, s. 33.
9. Kant, I., (1992). *O wiecznym pokoju. Zarys filozoficzny. (An eternal peace. Philosophical outline)*. Wstęp i redakcja K. Bał. Wydawnictwo Uniwersytetu Wrocławskiego, Wrocław, s. 107.
10. *Konstytucja RP*. (1997). (Constitution of the Republic of Poland). Warsaw.
11. *Nasza wspólna przyszłość*. (1991). (Our common future). Raport G.H. Brundtland, PWE, Warszawa.
12. *Polska wieś 2018. Raport o stanie wsi (Polish countryside. Report on the state of rural areas)*. (2018). Wilkin, J., Nurzyńska, I. (ed.). Wydawnictwo Naukowe SCHOLAR, Warszawa, pp. 43, 24, 124.
13. Rowe, J., W., Kohn, L. (1998). *Successful Aging*. Random Haus Publishing. New York.
14. Sikora, J., (2012). *Agroturystyka. Przedsiębiorczość na obszarach wiejskich (Entrepreneurship in rural areas)*. Wydawnictwo C.H. Beck, Warsaw.
15. Sikora, J., Kaczocha, W., Wartecka-Ważynska, A. (2015). *Values and professional and ethical norms in rural tourism in Poland*. Agricultural Economies. (AGRICEON). No 61/2015 (8), ss. 377-392.
16. Skowronski, A., (2003). *Wartości ekologiczne dla zrównowzonego rozwoju (Environmental values for sustainable development)*. (in:) A. Pawłowski (ed.), *Filozoficzne i społeczne uwarunkowania zrównowzonego rozwoju (Philosophical and social determinants of sustainable development)*, „Monografie nr 16 Komitetu Inżynierii Środowiska PAN”, Lublin.
17. Stanny, M. (2013). *Przestrzenne zroznicowanie rozwoju obszarów wiejskich w Polsce (Spatial diversification of rural development in Poland)*. Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk. Warszawa, s. 55.
18. Szatur-Jaworska, B. (2018). *Socjalna bibliografia polskich baby boomersów, czyli jak polityka społeczna kształtowała bieg życia tego pokolenia (Social bibliography of Polish baby boomers: how social policy shaped the course of life of this generation)*. Polityka Społeczna 2018; 9, ss. 1-7.
19. Act of 27 April 2001. (2001). *Environmental law*. Journal of Laws, No. No. 62, Pos. 672.
20. Walkowska, W. (2018). *Pokolenie „sandwich generation” w obliczu współczesnych przemian demograficznych (Sandwich generation facing contemporary demographic changes)* Polityka Społeczna 2018; 9, pp.7-12.
21. WHO. (2004). *A glossary of Terms for Community Health Care and Services for Older Persons*. Geneva.
22. Wojtyła, K., (1982). *Miłość i odpowiedzialność (Love and responsibility)*. KUL. Lublin, s. 43.
23. *Założenia Długofalowej Polityki Senioralnej w Polsce na lata 2014-2020 (Assumptions of Long-term Senior Policy in Poland for 2014-2020)*. (in:) Monitor Polski of 4 February 2014, item 118.
24. Zych, A., A. (2013). *Przekraczając „smugę cienia”. Szkice z gerontologii i tanatologii (Crossing the 'shadow line'. Sketches in gerontology and tanatology)*. Wyd. 2. Wydawnictwo Naukowe „Ślask”, Katowice.

MEASUREMENT AND EVALUATION OF THE SOCIO-ECONOMIC POTENTIAL OF RURAL AREAS IN POLAND

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Abstract. The article deals with issues that are socially and economically significant. The aim of the work was to identify, measure and assess the socio-economic potential of rural areas in Poland. The objective was implemented by defining four potentials reflecting the resources of the studied area and the socio-economic potential in general. The empirical part of the study was described using data from the CSO publications Rural areas in Poland in 2016. The study covered the year 2016. The method of the total normalized values of features was used to measure and evaluate the phenomenon creating the linear ordering of rural areas in Poland. The spatial differentiation of the studied phenomenon was observed.

Key words: socio-economic potential, rural areas, linear ordering.

JEL code: O10, O15, O18, C38.

Introduction

According to the nomenclature of the Central Statistical Office (CSO), the territory of Poland is divided into rural and urban areas. The rural areas in Poland include areas of rural municipalities and the rural part of the urban-rural municipalities. In 2016, they occupied over 93 % of the country's area and were inhabited by nearly 40 % of the Polish population (CSO, 2017). Taking into account only the data indicated, it should be confirmed that conducting research on these areas is important from the point of view of the state policy. These areas have resources which proper management can result in their development. The starting point for delineating the path of this development is the measurement and analysis of the potential of the area and constant control of changes in the resources owned.

Bearing in mind the above statements, the main goal of the work was to identify, measure and assess the socio-economic potential of rural areas in Poland.

The main objective was implemented by defining the types of analysed resources (four potentials separated with regard to the substantive criterion and data availability), measuring and assessing the potential of rural areas in the scope of indicated types of potentials and socio-economic potential in general. Data used in the study related to 2016 and are of a secondary nature. They come from the publications of the CSO *Rural areas in Poland in 2016*. The study conducted a linear ordering of rural areas in Polish voivodeships using the total standardized values of features. Spatial diversification of the socio-economic potential of rural areas was observed, which is confirmed by differences in positions occupied by rural areas of voivodeships in the presented rankings.

Socio-economic potential

The socio-economic potential is a complex concept referring to the resources of specific areas determining their development, which in literature is understood as „a long and complex process of positive quantitative and qualitative changes thanks to which the existing phenomena are being improved, and new ones are emerging and developing in the sphere of all economic, cultural and social activities and socio-production and political-systemic relations” (Kupiec L., 2008).

Rural areas in Poland have a huge, still insufficiently used, endogenous social and economic potential (Potential of rural areas ..., 2011). However, scientific research has confirmed their dynamic

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development in recent years (Wojewodzka-Wiewiorska A., Dudek H., 2016). These areas experienced a great civilization progress, expressed in the improvement of the quality of life, equipment of technical and social infrastructure, or the degree of spatial development. A part of rural areas has lost the typically rural character and has become similar to urban areas (Action plan for ..., 2015).

The socio-demographic resources constituting the population resource, which consists of the number of inhabitants, population density, population structure by sex and age, fertility, mortality and migration are an important component of the socio-economic potential. The unemployment rate, the employment rate, the number of employed and registered business entities are equally important. In recent years, the number of divorces in Poland has increased, as well as the age of women deciding on the birth of their first child, thus leading to the decline in the number of births and the increase in the number of extramarital births, which indicates their similarity with the urban areas. The analysis of demographic potential indicates a relatively favourable age structure of the rural population. In rural areas there was a higher percentage of population in pre-working age than in cities and a lower share of population in post-productive age. As a result of changes in economic age groups that took place in recent years, consisting in an increase in the number of people in the productive age and a decline in the number of people in the pre-working age, the demographic load factor decreased in the countryside. In 2016, there were 59 people in non-productive age per 100 inhabitants of rural areas in working age, compared to 64 in cities (CSO, 2017).

The socio-demographic potential is associated with social infrastructure, which include educational, cultural and health institutions. Their activity determines the quality of socio-demographic potential and determines the quality of life of the population. An important indicator for rural areas is the level of education of the population and access to various forms of education (Cintina V., Pukite V., 2018). In the Polish countryside, the availability of pre-school education is lower than in cities. In the school year 2016/2017, the number of children aged 3-6 under care in the pre-school education institutions amounted to 634 per 100 children and doubled compared to the school year 2006/2007. The rural areas of Poland are also rich in objects of national heritage and cultural institutions. However, the rural population, due to the more difficult financial situation compared to the urban population, is less involved in cultural activities. In the field of social infrastructure of rural areas in Poland, an increase in access to out-patient health care services (clinics and medical practices) was also noted. In comparison to 2006, an increase in the number of these units was observed (by 36.4 %) and the number of advice provided in them (by 11.3 %) (CSO, 2017).

Other important factors determining the socio-economic potential of rural areas in Poland are housing conditions and equipping the areas with technical infrastructure. The importance of housing results from the role of housing as a basic good and at the same time satisfying a number of higher-order needs. Housing is essential for the standard of living of citizens, as well as for the strength and economic development of the country (Nykiel L., 2012). Housing resources in rural areas in 2016 accounted to 32.6 % of housing resources in Poland. The average usable area of the apartment located in the rural areas was greater than in cities (93.12 m² compared to 64,45 m²). However, taking into account the fact that the number of people in this area per one apartment in the village was higher than in cities, there is a similar usable area of an apartment per one person as in cities (CSO, 2017).

Technical infrastructure is a key factor in shaping the settlement network. It determines the attractiveness of rural areas as a place to invest and live and directly affects the process of creating

new jobs, and improves the standard of living and encourages migration to the countryside, hampering the depopulation of rural areas (Potential of rural areas ..., 2011). Although disproportions in equipping apartments with installations between cities and villages have decreased, still the apartments in the village were equipped worse than apartments in the cities. Still a significant percentage of apartments inhabited in rural areas was connected to local devices, used gas from cylinders (73.6 % compared to 18.7 % in cities) and was heated with furnaces (16.0 % compared to 13.0 % in cities) (CSO, 2017).

The advantage of rural areas in Poland is their natural diversity. The activities in the field of environmental protection are important for social and economic development. They may take the form of rational shaping and management of its resources in accordance with the principle of sustainable development, preventing pollution, recycling or maintaining and restoring natural elements to the proper state (Sompolska-Rzechula A., Olenczuk-Paszal A., 2017). In recent years, in rural areas, there has been a significant increase in the number of publicly available facilities and areas (including parks and green areas), typical of urban areas. There is a decrease in emissions of dust and gas pollution, with a simultaneous increase in the amount of municipal waste generated by household in rural areas (CSO, 2017).

Socio-economic potential of rural areas in Poland is diverse, which is the cause of various development problems. The peripheral rural municipalities are in the worst situation, which are far from a large urban centre and the strength of its impact. Development policy must be targeted and correspond to the real problems of a given areas, and at the same time it must be based on local values and strengths. This is done by research covering the resources of those areas in which they are identified, measured and evaluated.

Method

The socio-economic potential of rural areas is identified with resources of a different nature existing in a given area, at a specific point in time and described by means of indicators reflecting their essence. It is a complex phenomenon, for the measurement and assessment of which the methods should be used which enable the comparison of objects described by a set of many features by reducing them to a synthetic measure, being a function that aggregates partial information contained in individual characteristics (Gatnar E., Walesiak M., 2004). The synthetic variable is obtained by implementing the following stages (Grabinski T., 1992, Wysocki F., 2010): determining the initial matrix of characteristics, reducing the matrix of diagnostic features, determining the direction of character preferences, giving weight to features, normalizing features, aggregation of standardized features, creating a linear ordering of objects due to level of the complex phenomenon under consideration. Among many methods based on synthetic variables, the method of total normalized variables was selected for the study. The normalization was performed with the help of zero unitarization (Kukula K., 2000) for stimulants, whereas destimulants were changed into stimulants according to the differential transformation (Panek T., 2009). The value of the synthetic variable was calculated using the arithmetic mean:

$$S_i = \frac{1}{m} \sum_{j=1}^m z_{ij}; i = 1, \dots, n \quad (1)$$

where: m – number of diagnostic features, n – number of objects, z_{ij} – normalized value of diagnostic features. The higher the value of the meter s_i , the higher the level of development of a given object in terms of a given criterion.

Research results and discussion

Bearing in mind the purpose of the work, which concerns the measurement and assessment of the socio-economic potential of rural areas in Poland and the availability of data, in the work, taking into account the substantive criterion, the following initial list of diagnostic features included in the four potential groups was adopted:

I. Socio-demographic:

X_1 – working age population in % of the total population; X_2 – marriages per 1000 of population; X_3 – alive births per 1000 of population; X_4 – natural increase per 1000 of population; X_5 – total fertility rate; X_6 – demographic dynamics coefficient; X_7 – deaths per 1000 of population; X_8 – balance of internal and foreign migration per permanent residence per 1000 of population; X_9 – professional activity rate (%); X_{10} – employment rate (%); X_{11} – unemployment rate (%); X_{12} – working per 1000 of inhabitants; X_{13} – entities of the national economy newly registered in the REGON register per 1000 of population.

II. Social infrastructure:

X_1 – children in pre-school education institutions aged 3-6 per 1000 of children aged 3-6; X_2 – number of students per 1 primary school; X_3 – gross enlargement ratio in primary schools; X_4 – borrowing the book collection from public libraries per 1 reader in volumes; X_5 – public libraries per 1000 of population; X_6 – cultural institutions per 1000 of population; X_7 – population per 1 object of outpatient health care; X_8 – population per 1 generally accessible pharmacy and pharmacy point; X_9 – advice per 1 inhabitant; X_{10} – houses and social welfare facilities per 1000 of population; X_{11} – accommodation per 1000 of population; X_{12} – sports clubs per 1000 of population.

III. Housing and technical infrastructure:

X_1 – apartments per 1000 of population; X_2 – apartments equipped with water supply in % of total housing; X_3 – apartments equipped with a lavatory in % of total housing; X_4 – apartments equipped with a toilet in % of total housing; X_5 – apartments equipped with gas from the network in % of total housing; X_6 – apartments equipped with central heating in % of total housing; X_7 – apartments put into use per 1000 of population; X_8 – water supply network in km/100 km²; X_9 – sewage network in km/100 km²; X_{10} – gas network in km/100 km²; X_{11} – population using the water supply network in w % of total population; X_{12} – population using the sewerage network in % of total population; X_{13} – population using the gas network in % total population; X_{14} – public outdoor roads with hard improved surface in km/100 km².

IV. Environmental:

X_1 – woodiness %; X_2 – walking and recreation parks, green areas and greenery areas per 1 inhabitant in m²; X_3 – industrial and municipal sewage treated in % of wastewater requiring treatment; X_4 – sewage treated per 100 km² in dam³ (municipal); X_5 – population using the sewage treatment plants in % of total population; X_6 – waste (excluding municipal waste) generated per 1 km² in t; X_7 – collected municipal waste mixed per 1 inhabitant in kg.

The method of linear ordering of objects based on the total normalized values of diagnostic features was used to implement the goal. The proceedings used the zero uniformization method (Kukuła K., 2000). Previously, the type of features was determined and the following was assumed as destimulants: the unemployment rate (%) and collected municipal waste mixed per 1 inhabitant in kg, which were transformed into stimulants.

The selection of diagnostic features for the study proceeded according to the following stages:

- 1) Determining the degree of variability of features using the coefficient of variation.

Assessment of the degree of correlating features in particular areas using the Hellwig parametric method.

2) Selection of features from individual areas.

3) Applying the substantive approach, recognizing that all areas are equally important from the point of view of the socio-economic potential of the areas studied, three features from each area were selected.

Finally, the following set of diagnostic features was obtained relating to the potential:

I. Socio-demographic: X_4 , X_8 , X_{11} .

II. Social infrastructure: X_5 , X_6 , X_9 .

III. Housing and technical infrastructure: X_7 , X_8 , X_{12} .

IV. Environmental: X_1 , X_4 , X_7 .

The general potential of socio-economic rural areas in Poland was determined by means of all the features that make up particular types of potentials.

Table 1 presents the results of linear ordering of rural areas in Poland, taking into account particular types of potentials and socio-economic potential in general.

Table 1

Linear ordering of rural areas in Poland, taking into account particular types of potentials and socio-economic potential in general

Voivodeship	The place in the ranking in terms of potential				
	socio-demographic	social infrastructure	housing and technical infrastructure	environmental	in general
dolnoslaskie	3	4	6	12	4
kujawsko-pomorskie	8	10	4	16	8
lubelskie	13	6	15	7	15
lubuskie	9	13	14	6	13
lodzkie	7	8	10	13	10
malopolskie	4	9	5	3	3
mazowieckie	6	15	7	9	9
opolskie	10	1	13	10	7
podkarpackie	14	3	8	1	6
podlaskie	11	7	16	8	14
pomorskie	2	11	1	5	2
slaskie	5	5	3	2	1
swietokrzyskie	15	12	9	4	12
warminsko-mazurskie	16	14	12	11	16
wielkopolskie	1	16	2	14	5
zachodniopomorskie	12	2	11	15	11

Source: authors' calculation based on Rural areas in Poland in 2016, CSO, Warszawa, 2017

The rural areas of the wielkopolskie voivodeship occupy the first place in the ranking in terms of socio-demographic potential. This is due to the lowest value of the X_{11} feature – the unemployment rate (%) which is the destimulant and from the high values of variables constituting stimulants. The lowest value of the measure, and thus the last place in the ordering goes to rural areas of the warminsko-mazurskie voivodeship, which are characterized by values of features unfavourable from the point of view of the socio-demographic potential.

In terms of the potential for social infrastructure, the opolskie voivodeship took the highest place. This situation results from the highest value of the X_5 feature – public libraries per 1000 of population and high values of the X_6 features – cultural institutions per 1000 of population and X_9 – advice per 1 inhabitant. The last place in the linear ordering of rural areas in terms of social infrastructure is taken by the wielopolskie voivodeship. The values of the features adopted in the study are unfavourable in this case.

The pomorskie voivodeship occupies the first position in the ranking of rural areas regarding the housing potential and technical infrastructure. In this area, the highest values of the following features were recorded: X_7 – apartments put into use per 1000 of population and X_{12} – population using the sewerage network in % of total population. The rural areas of the podlaskie voivodeship rank last in the ranking, which results from the values achieved by the characteristics adopted in the study, unfavourable for the described potential.

High values of the characteristics of stimulants (X_1 – woodiness %, X_4 – sewage treated at 100 km² in dam³ (municipal)) and low value of the destimulant feature (X_7 – collected municipal waste mixed per 1 inhabitant in kg) determined the first place in rural areas of the podkarpackie voivodeship in the ranking of these areas in terms of environmental potential. In 2016, the worst position, taking into account the accepted diagnostic features, was taken by the kujawsko-pomorskie voivodeship, which was characterized by the low forest cover (%), low value of the characteristic for sewage treated at 100 km² in dam³ (municipal) and high value of the feature related to collected municipal waste mixed per 1 inhabitant in kg.

The ordering of rural areas of Poland in terms of the socio-economic potential in general was done as the line linear ordering. To build this ranking, the diagnostic features taken into account in individual potentials were used. The leading position is occupied slaskie voivodeship, which ranks high in particular rankings (from the 2nd place due to the environmental potential to the 5th place due to the socio-demographic potential and technical infrastructure). This is a consequence of the favourable values of the characteristics accepted for the study. The ranking of rural areas due to the socio-economic potential in general is closed by the warminsko-mazurskie voivodeship, which in separate areas of analysis was located at distant places of rankings (from the 11 place in the field of environmental potential to the 16th place in the socio-demographic potential).

The analysis of data on the position of rural areas in individual voivodeships made with reference to four separate potentials is the basis for stating that these areas are ranked on various positions of the rankings. In 2016, the same position was recorded only in relation to two voivodeships. The slaskie voivodeship occupies the fifth position in terms of the ranking on socio-economic potential and social infrastructure, while the opolskie voivodeship is tenth in terms of the socio-economic and environmental potential. The biggest difference in the occupied places concerns the wielkopolskie voivodeship, which in the case of socio-economic potential took the 1st place, and in the case of social infrastructure the 16th place. The difference between the 1st and 14th place concerned the podkarpackie voivodeship, respectively, in terms of environmental and socio-demographic potential, while the difference in the position of the zachodniopomorskie voivodeship from the 2nd place in the area of social infrastructure to 15th in terms of environmental potential.

In the case of eleven voivodeships, it was observed that their positions in the ranking in terms of socio-economic potential in general were the same as positions in one of the rankings created for four partial potentials, e.g. in the ranking in terms of socio-economic potential in general terms and

the socio-demographic potential, the second place is occupied by the rural areas of the pomorskie voivodeship, whereas the sixteenth by the rural areas of the warminsko-mazurskie voivodeship.

It was analysed whether there are links between voivodeships' positions in terms of particular types of potential and potential in general terms. Connections were observed in two cases – between the positions due to socio-demographic and residential potential as well as technical infrastructure and items according to the general potential. This is evidenced by the Kendall correlation coefficient τ , respectively: 0.550 and 0.667, according to which the higher the position of the voivodeship in terms of socio-demographic or housing potential and technical infrastructure, the higher the position in terms of socio-economic potential. In other cases, the Kendall correlation coefficient τ values were low, indicating a lack of dependence between the positions of the voivodeship in individual orders, e.g. the podlaskie voivodeship occupied the seventh place in the ranking due to the potential of social infrastructure and at the same time the sixteenth place considering the housing potential and technical infrastructure.

Conclusions

The conducted study allowed to draw the following conclusions:

- 1) The assessment of the socio-economic potential of rural areas, which is a complex issue, has been made due to the identification of resources available to these areas.
- 2) All features accepted in the study were characterized by strong variability, thanks to which they could effectively discriminate against the rural areas.
- 3) Rural areas in Poland were strongly spatially diverse in terms of socio-economic potential and partial potentials, taking into account the adopted diagnostic features, which was confirmed by the analysis using the selected method of linear ordering.
- 4) In the rankings of rural areas created taking into account socio-demographic potential, social infrastructure, housing conditions and technical and environmental infrastructure, the areas of the wielkopolskie, opolskie, pomorskie and podkarpackie voivodeship took the first place, respectively. The last place in the ordering was given to the areas of warminsko-mazurskie, wielkopolskie, podlaskie and kujawsko-pomorskie voivodeship.
- 5) The leading place in the linear ordering of the examined areas in terms of socio-economic potential in general was taken by the slaskie voivodeship and the last by the warminsko-mazurskie.
- 6) There were reports of connections between voivodeships' positions due to socio-demographic and housing potential, as well as technical infrastructure and items according to socio-economic potential in general. This is confirmed by the high Kendall correlation coefficient τ value. In the case of other orders, there was a lack of compliance in the positions occupied.

Bibliography

1. Cintina, V., Pukite, V. (2018). Analysis of Influencing Factors of Use of Agricultural Land, *Research for Rural Development 2018*. Vol. 1, Jelgava, Latvia: Latvia University of Agriculture, pp. 181 – 182.
2. Gatnar, E., Walesiak, M. (red.). (2004). *Metody statystycznej analizy wielowymiarowej w badaniach marketingowych (Methods of statistical multidimensional analysis in marketing research)*. Wydawnictwo Akademii Ekonomicznej we Wrocławiu, Wrocław, p. 351.
3. Grabinski, T. (1992). *Metody taksonometrii (Methods of taxonometry)*. Wydawnictwo Akademii Ekonomicznej w Krakowie, Krakow, p. 136-137.
4. Kukula, K. (2000). *Metoda unitaryzacji zerowanej (The method of zero-standardization)*. Wydawnictwo Naukowe PWN, Warszawa, p. 79.

5. Kupiec, L. (2008). Jaki rozwój? (What development?), *Rozwoj regionalny a rozwój zrównowazony. (Regional development and sustainable development)*, A.F. Bocian (red.). Wydawnictwo Uniwersytetu w Białymstoku, Białystok, p. 22
6. Nykiel, L. (2012). Mieszkania na wynajem jako warunek rozwoju rynku mieszkaniowego (Flats for rent as a condition for the development of the housing market). *Studia i Materiały Towarzystwa Naukowego Nieruchomości* – vol. 20 nr 3, p. 95.
7. *Obszary wiejskie w Polsce w 2016 r. (Rural areas in Poland in 2016)*. (2017). GUS (CSO), Warszawa, pp. 21-23.
8. Panek, T. (2009). *Statystyczne metody wielowymiarowej analizy porównawczej (Statistical methods of multivariate comparative analysis)*. Wydawnictwo Szkoły Głównej Handlowej w Warszawie, Warszawa, p. 67.
9. *Plan działania dla obszarów wiejskich (Action plan for rural areas)*. (2015). Kancelaria Prezydenta RP, Warszawa, pp. 9-10.
10. *Potencjał obszarów wiejskich szansa rozwoju (Potential of rural areas as a chance for development)*. (2011). Kancelaria Prezydenta RP, Spala, p. 27.
11. Sompolska-Rzechuła, Olenczuk-Paszal, (2017). Poziom życia ludności na obszarach wiejskich i miejskich w Polsce, (Level of living of the population on rural and urban areas in Poland), *Wies i Rolnictwo*, IRWiR PAN, Warszawa, pp. 83-84.
12. Wojewodzka-Wiewiorska, A., Dudek, H. (2016). Dynamics of Rural Areas Development in Poland – Convergence Analysis, *Research for Rural Development 2016*. Vol. 2, Jelgava, Latvia: Latvia University of Agriculture, pp. 99 – 105.
13. Wysocki, F. (2010). *Metody taksonomiczne w rozpoznawaniu typów ekonomicznych rolnictwa i obszarów wiejskich (Taxonomic methods in recognizing economic types of agriculture and rural areas)*. Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu, Poznań, p. 143-145.

EDUCATION OF FARMERS IN THE FIELD OF SUSTAINABLE DEVELOPMENT IN THE DAIRY INDUSTRY IN POLAND

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Abstract. The paper addresses the problem of challenges posed by the global market in the field of sustainable development objectives and the enterprises' ability to achieve them. The leading entrepreneurs are developing increasingly innovative and original socially responsible strategies. At the same time, entrepreneurs who do not create long-term strategies are lagging behind. The paper discusses corporate social responsibility on the food market, and more precisely on the dairy market. The analysis covered socially responsible activities undertaken by dairy companies from the Top 10 list. Particular attention has been paid to the crucial link in a supply chain - dairy farmers. Nowadays, consumer surveys show that, when it comes to dairy companies, they care where the milk comes from and how it is produced, how the cows are treated and how the company engages in cooperation with suppliers. There are companies on the dairy market in Poland who have launched a strategic approach to CSR a long time ago by implementing many innovations in creating a competitive advantage on the market. There are companies who have successfully adapted to changes and also those that cannot combine economic, social and environmental goals. The study aims to make a contribution to further detailed research on creating competitive advantage based on sustainable business models in dairy enterprises.

Key words: education, farmer, milk producer, sustainable development

JEL code: A13, Q18.

Introduction

The Sustainable Development Goals (SDGs) announced by the UN comprise new tasks and strategic cooperation between various stakeholder groups. Actions aimed at achieving the objectives of sustainable development create the opportunity to build a sustainable competitive advantage (Bocken, Short, Rana, Evans, 2014). One of the sources of competitive advantage, beyond reputation, is the development of innovative products and services that respond to the needs of more informed and responsible consumers. The agri-food sector is one of the key areas where sustainable development is of particular importance. The global demand for food products has been on the rise in recent years. The dairy market is becoming an increasingly demanding food market. There is a decline in the prices of both strategic products, e.g. butter as well as sour milk products (e.g. yoghurts). The prices of dairy products are decreasing on all world commodity markets. This trend generates increased competition and encourages companies to offer more and more „transparent” products to meet the demand of consumers who are prepared to pay more for responsible business practices (portal spozywczy.pl, update date 02/02/2019). According to A. Parzonko (2010) the promoted sustainable development of agriculture remains, to some extent, in opposition to the actual economic reality. Since 2004 farms in Poland have transformed in the direction of deeper specialization and agricultural production of one type tended to concentrate in a given region. Looking through the prism of sustainable development, these changes may not be beneficial, especially in the environmental dimension. The traditional understanding of the sustainability of agricultural production is defined with regard to securing food supplies and the impact of agriculture on the preservation of natural resources (Zegar, 2009). The challenge for the agri-food economy is therefore such sustainable development, which involves management methods ensuring simultaneous implementation of production, economic, ecological and social goals (Runowski, 2004). It also turns out that the announced Sustainable Development Goals (SDG) require new strategic actions from

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enterprises and cooperation between various stakeholder groups. In the context of SDG and corporate social responsibility, attention is paid to improving the competitiveness of the agri-food sector, sustainable development of rural areas, a sustainable supply chain, improvement of the natural environment, improvement in life quality and diversification of rural economy (Stawicka, 2015). The creation of business strategies has become characteristic of Polish dairy enterprises. Over the last few years, a number of innovations involving automation and robotics have been implemented and the milk yield of dairy cows has significantly improved. Despite the difficulties on the global milk market, specific, innovative and responsible practices ensure the development of entities involved in the production, processing and trading of milk and milk products.

The key challenges in implementing business strategies and sustainability goals include the quality of human resources, knowledge and financial resources. The need for changes is related to effective knowledge transfer, implementation of modern technologies and change in attitudes.

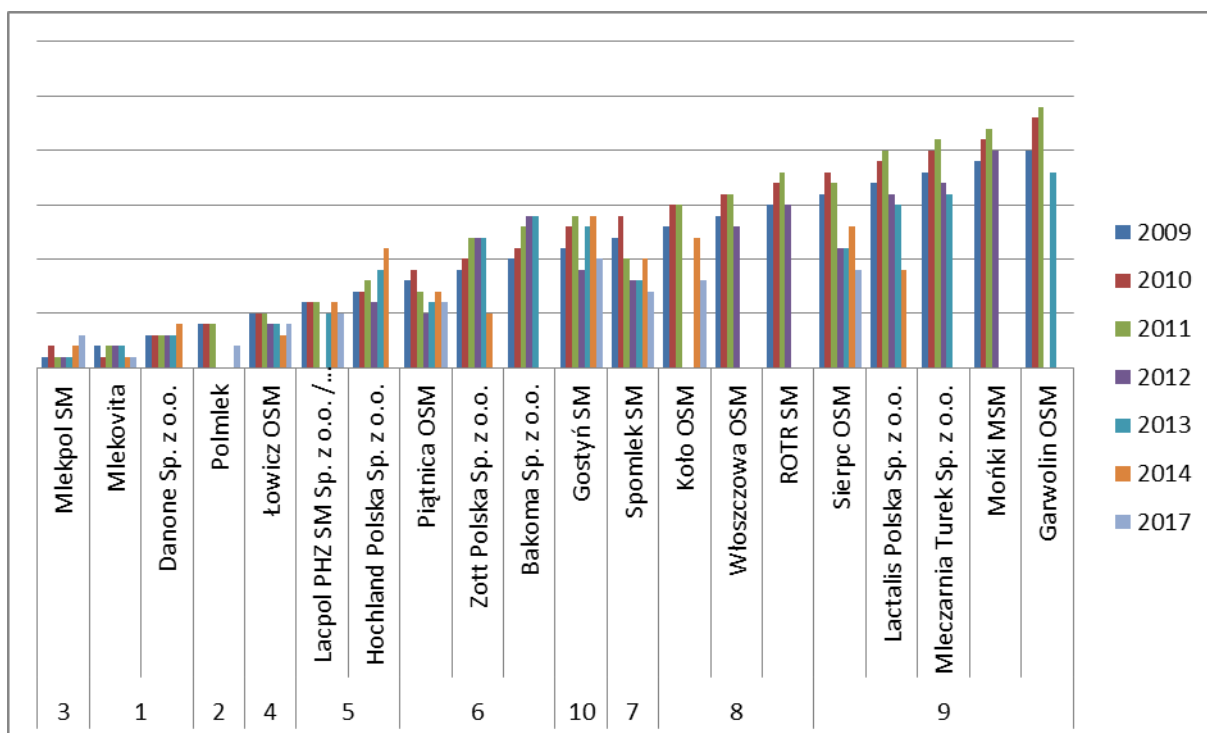
The aim of the study was to characterize the implementation of socially responsible strategies in dairy enterprises of various organizational and legal forms with particular focus on one of the elements of the strategy which is the education of dairy farmers (as the main stakeholders in the supply chain). The study attempts to present the processes of shaping attitudes, broadening knowledge and implementing innovations in the case of dairy farmers, who cooperate with dairy enterprises. The research analysis covers dairy companies from the „Top 10” list with the focus on their policies regarding shaping attitudes and education of farmers cooperating with dairies.

The paper aims to make a contribution to further research on the strategy of dairy enterprises in creating a competitive advantage, including cooperation and participation of stakeholders in the process of a sustainable supply chain. The results of the analyses were presented in graphical and tabular form.

Development trends on dairy market in Poland

In Poland, the region with the longest dairy traditions is Podlaskie, and the dairy leaders are Mlekovita (based in Wysokie Mazowieckie) and Mlekpól (based in Grajewo). Also the district dairy cooperative Piątnica has roots in Podlaskie region and, like the two previous cooperatives, is a dairy leader. The large dairy sector entities also include Polmlek, Lacpól, Spomlek, Sierpc, Kolo, Gostyn and companies with foreign capital such as Danone or Hochland. Podlaskie is the place of origin for numerous cheeses included in the List of Traditional Products held by the Ministry of Agriculture. The list includes e.g. Hajnowski curd cheese, Swiss type cheese from Wizajny and local cheese from Korycin. The processing plants from Podlaskie, along with offering traditional specialties, also launch innovative products. Mlekpól produces lactose-free yoghurts and Mlekovita, which offers over 800 products, is the only dairy company in Podlaskie which produces ice cream on an industrial scale. Only in 2015 Mlekovita launched 116 new dairy products (mleczarstwo.com).

Since the beginning of the 1990s, the leader of the CSR practices in the dairy industry on the Polish market was Danone Mlekovita, on the other hand, has become the leader on the dairy market since about 2014. At present, Mlekovita owes its strong position to a large number of acquisitions and it now has 19 production plants. Mlekpól has only 4 plants less. In 2017, the top places in the Top 10 ranking were taken by Mlekovita, Polmlek, Mlekpól, Lowicz, Lacpól, Piątnica, Spomlek, Kolo, Lactalis, and Gostyn (Figure 1).



Source: author's calculations based on portalspozywczy.pl, updated on 31 January 2019

Fig. 1. Top 10 dairy producers in Poland in 2009 - 2017

It seemed that Polish dairy cooperatives will not be able to beat off fierce competition from Danone, Dr. Oetker or Hochland. However, since 2004, after Poland's accession to the EU, dairy plants have turned out to be a phenomenon, and it is the global producers with foreign capital who are now in trouble. They have been taken over or pushed out of the market by Mlekovita, Mlepol and Polmlek, whose total revenues have already exceeded 10 billion PLN (mlekovita.com.pl).

When in 1992 Danone appeared on the Polish market, it focused on developing good practices in the field of sustainable development and CSR. Its strategy covered such areas as:

- economic impact on local communities through the purchase of milk, raw materials and packaging – preventing environmental pollution, feeding animals with appropriate forage, paying attention to the harmful effects of methane;
- environmental and ecological impact, responsible and economical approach to water and energy consumption;
- facilitating employees' professional development, creating a friendly organizational culture, securing regular payments for farmers and development assistance for suppliers;
- responsible transport, e.g. wall to wall factory, (e.g. packages for Actimel series products are produced next to the yogurt production site); planning transport routes to reduce the number of kilometres travelled, optimizing the loading of goods so that No space is wasted in vehicles;
- measurable and documented results of reduction of water and energy consumption, creation of a new environmental strategy. Danone initiated the cooperation approach to the so-called a new generation of farmers (Danone report, 2018).

It is difficult to assess to what extent these practices have also influenced the functioning of Polish dairy cooperatives, which are now economically successful. Their success may be attributed to the quality of Polish milk, but also to the responsible practices of dairy cooperatives towards the stakeholders - primarily dairy farmers.

For example, the Sierpc cooperative pays particular attention to the quantity and quality of protein in milk bought from farmers. The cooperative encourages, educates and supports farmers - „we reward farmers for the quality of milk” (osm-sierpc.pl). Mlekpól from Grajewo (mlekpól.com.pl) successfully launched the very popular „Laciate”(„Spotted”) milk. Mlekovita, in reaction to consumers’ frequent health concerns, developed a range of milk products without lactose (mlekovita.com.pl). Dairy companies strongly emphasize CSR practices, but they mainly regard their product offer. This is evidenced by the diversity of offering and attempts to get in new markets, e.g. OSM Koło received HALAL certificate for milk powders and butter (osmkolo.pl). Spomlek, on the other hand, wants to function in the HoReCa (food and beverage service) trade channel. They offer cheeses for cheese boards served in hotel restaurants. Spomlek seeks the recommendations of the best cooks and chefs for its cheeses. According to experts, Amber, Rubin and Szafir are the best Polish long-ripening cheeses. They are created in Radzyn Podlaski under the supervision of experienced cheese makers, according to recipes developed over 15 years ago (spomlek.pl). An interesting product innovation is Skyr offered by OSM Piatnica – an Icelandic yoghurt produced according to traditional recipe, which gained popularity in Europe and the United States. The product is characterised by high protein content and zero fat. It is particularly popular with consumers leading an active and healthy lifestyle. The cooperative from Piatnica offers this yoghurt in four flavour versions, as well as Skyr natural (piatnica.com.pl). Another project, aimed to reward the high quality milk from dairy farmers and their individual approach to achieving sustainable goals is the „Farm of the Year” competition. It is a flagship initiative of Spomlek dairy cooperative which is supposed to reward the most modern and most prosperous farms. The competition emphasizes the aspect of a sustainable supply chain and the success of the dairy plant in cooperation with farmers and suppliers. During the gala, farmers cooperating with the company are awarded prizes for their breeding work, production dynamics and delivery of the highest quality raw material. The winners receive the „Farm of the Year” titles and the main prizes - yellow and spotted Skoda cars resembling „Serenada” cheese produced by Spomlek (spomlek.pl).

There are also changes in Polish dairy cooperatives’ exports. For example, Mlekpól exports a significant part of its production, sending its products to almost all countries in the world. They can be found on the shelves in shops in the European Union countries, mainly Italy, France, Germany, the Netherlands, Belgium, Spain, Czech Republic and Great Britain as well as to Africa and the Far East. The export offer includes hard cheeses, skimmed milk powder, butter and whey powder (IERiGZ-PIB, 2017).

Social responsibility as part of sustainable development is becoming an increasingly common practice in the dairy industry, which stimulates high quality and innovation to meet the growing needs of stakeholders. The number of innovative ideas implemented by dairy companies is growing. They actively work out CSR strategies which engage farmers in the process of knowledge exchange and decision making. The actions of stakeholders and the exchange of knowledge lead to gaining competitive advantages on the market. These practices increasingly result in growing exports and determine a competitive advantage also in the global market.

Sustainable Agriculture Program - transfer of knowledge and education to the agricultural practice of dairy farmers

All the above-mentioned successes in the dairy industry originate in the „new times” strategies, which involve sustainable supply chain management and enhancing milk quality, where a key role is played by farmers who supply milk to dairy plants.

An example of a Sustainable Development Plan (SDP) is the strategy developed by Danone. The SDP program is a concept of milk production development that combines economic, social and quality objectives with environmental requirements and caring about the wellbeing of future generations. The SDP program is a pioneering initiative of Danone. Research shows that consumers increasingly care about the quality of milk: where it comes from, how it is produced, how cows are treated, and whether the company engages in cooperation with suppliers. The plan consists of seven pillars implemented through individual operational strategies. To achieve the assumed objectives Danone holds regular workshops and trainings for farmers, developed a website for milk suppliers - emilka.danone.pl and encourages contact via e-mail and telephone. Seminars concerning quality standards and production specifics are organized for farmers and suppliers. The seminars also include visits to the factory, discussions and sharing good practices regarding e.g. quality of milk, which in 70 % depends on the conditions in which cows live. Danone is an example of a company facilitating constant cooperation with farmers and their education. In total, Danone cooperates with 350 farmers who have 17 000 cows. Farms are constantly monitored by independent laboratories and farmers are supported with free consultations of zootechnicians. Danone also supports many farms financially by providing loans to farmers buying equipment or heifers. Farmers also participate in trainings on environmental protection, programs aimed at reducing water and energy consumption and limiting the use of plant protection products (Danone Reports, 2006-2009, 2010-2012, 2017).

High standards are required from farmers but they are also trained to meet them. Danone builds long-lasting and stable relations with farmers, which ensure the continuity of deliveries and timely financial settlements. All these activities also result in improving the life quality in the countryside and production of healthier and safer products.

Intensive cooperation with farmers is not just the domain of Danone. Other dairy enterprises are also increasingly involved in educating and motivating farmers with regard to responsible practices. Dairy companies often reward farmers mainly for high quality milk, (although, there are cooperatives which put quantity ahead of quality). Global trends and sustainable development involve more demanding consumers, who pay attention to aspects other than just price and want to gain knowledge about the method of milk production. The price for 100 l of milk is on the rise and in 2017 it amounted to 138.62 PLN. This is related to the increase in the number of cows (Rynek mleka, 2018).

Farmers' education, automation and robotics, as well as other innovations in the dairy industry, improve cow milk yield (Table 1).

To a large extent, Polish farmers themselves observe the market trends and seek knowledge in the field of dairy cattle breeding. The high quality of Polish milk is also confirmed by the VLOG certificate, which is more and more often awarded to Polish farmers. The first VLOG certificate in Poland was held by Hochland, and Strzelecka Spółdzielnia Producentów Mleka (cooperative of milk producers) is the second entity in the Polish dairy sector, holding the „non GMO” certificate for compliance with the VLOG standard (bureauveritas.pl). This is the result of cooperation between

Polish farmers and the dairy industry aimed at transparent milk production in accordance with sustainable development trends.

Table 1

Milk yield of cows and number of cowsheds by province in 2017

No	Province	Milk yield (kg of milk per year)	Number of cowsheds
1.	Pomorskie	7850	989
2.	Zachodnio-pomorskie	8443	265
3.	Warmińsko-mazurskie	7725	1564
4.	Podlaskie	7986	4111
5.	Kujawsko-pomorskie	8360	1648
6.	Mazowieckie	7902	4045
7.	Lubuskie	9022	82
8.	Wielkopolskie	8725	3434
9.	Łódzkie	7887	1462
10.	Lubelskie	8116	1081
11.	Dolnośląskie	9001	211
12.	Opolskie	9056	287
13.	Śląskie	9002	318
14.	Świętokrzyskie	7630	265
15.	Małopolskie	5962	697
16.	Podkarpackie	6127	323

Source: based on data from www.regiohurt.pl, PFHBiPM, updated on 25 - January 2019

In Poland, farmers are also increasing their herds of cows. The average herd in 2017 counted 38 cows. The structure of the herds, however, looked as follows:

- up to 9 cows were kept in 839 herds (-2.6 %);
- from 10 to 19 cows were kept in 4351 herds (-4.7 %);
- from 20 to 49 cows were kept in 1,1033 herds (+ 0.9 %);
- from 50 to 149 cows were kept in 3366 herds (+ 10.9 %);
- from 150 to 299 cows were kept in 294 herds (+ 3.5 %);
- from 300 to 499 cows were kept in 94 herds (+ 1.1 %);
- more than 500 cows were kept in 55 herds (+ 5.8 %).

Only 9 herds had more than 1000 cows and in over 300 cowsheds only 6 cows were kept (Ocena i hodowla ..., 2018).

The leaders achieving the best milk yield exceeding 9,000 kg of milk per cow per year came from the following provinces: Opolskie (9056 kg), Lubuskie (9022 kg), Śląskie (9002 kg), and Dolnośląskie (9001 kg) (www.topagrar.pl, update date 04/02/2019).

The changes in farmers' attitudes in the field of responsible and sustainable development regard the very approach to cow breeding, effective use of pastures, appropriate organization of grazing, optimal forage feeding and the botanical composition of the pasture.

There are more and more cows that have achieved total production of over 100,000 kg of milk during their lifetime. The record holder was Doris 129, a cow from the Komorowo farm (Kujawsko-pomorskie province), which for 12 years produced 169 327 kg of milk (Ocena i hodowla..., 2018).

Farmers in accordance with the trends of sustainable development more and more often meet the highest EU standards in terms of dairy cattle breeding and milk quality. The cowsheds have improved significantly and are now adequately equipped, well-ventilated and illuminated. The feeding of cows

is monitored; the forage is specially composed and prepared. The welfare of cows, health and safety at work as well as the economic development of farms with regard to the protection of the environment are improving. However, these practices are not applied on all dairy farms. Sustainable agriculture is not a common phenomenon on farms. The problem is insufficient financial resources and often lack of up-to-date know-how and innovation both on farms and in cooperating dairy plants. Social responsibility aspect differs depending on the company's legal ownership. Companies with foreign capital and dairy cooperatives demonstrate a wide variety of practices ensuring the participation of farmers and suppliers. Multinational enterprises dominate with regard to better change management in the CSR and SDP strategies, preparing social reports and communicating good practices.

Conclusions, proposals, recommendations

- 1) The biggest changes related to CSR and the development of Polish companies in the dairy industry appeared after Poland's accession to the European Union. This is, among others, the result of more intensive actions undertaken in the field of farmers' education and shaping attitudes towards sustainable development of agriculture.
- 2) When analysing dairy plants from the TOP10 list one may identify various CSR practices and be able to either directly or indirectly determine the business model of the enterprises. On the other hand, the practices of Danone or Hochland are a transformational model and set an example of involving farmers in knowledge sharing process in order to disseminate the idea of sustainable development.
- 3) The assumptions of the sustainable development program are particularly promoted by Danone and are aimed at long-term and stable development of farms, in particular ensuring cow's well-being and production of high quality milk, economic development of farms, occupational safety and health, rural community development and actions for the protection of environment.
- 4) Although all dairy plants declare to a greater or lesser extent the policy of sustainable development and CSR, it very often focuses on the product offer and highlighting high quality. CSR is still reduced to marketing and sponsoring activities. The dairy enterprises, despite meeting quality criteria, are not fully responsible and transparent in their practices.

Bibliography

1. Bocken, N.M.P., Short S.W., Evans S., A Literature and Practice Review to Sustainable Business Model. *Journal of Cleaner Production* 65 (2014) 42-56.
2. Parzonko, A. (2010). Globalne i lokalne uwarunkowania rozwoju produkcji mleka [Global and local determinants of milk production development]. Wydawnictwo SGGW, p. 8.
3. Runowski, H. (2004). Zrównoważony rozwój gospodarstw i przedsiębiorstw rolniczych [Sustainable development of agricultural holdings and enterprises. (In:) M. Kłodzinski (Ed.), *Gospodarka, człowiek, środowisko na obszarach wiejskich* [Economy, man and the environment in rural areas], IRWiR PAN, pp. 224-238.
4. Stawicka, E. (2015). Społecznie odpowiedzialne praktyki rynkowe przedsiębiorstw w obszarze relacji z konsumentami [Socially responsible market practices of enterprises in the area of consumer relations]. *Journal of Agribusiness and Rural Development*, No. 3, pp. 539-545.
5. Zegar, J. (2009). Z badań nad rolnictwem społecznie zrównoważonym [10]. Raport końcowy, synteza i rekomendacje [Research on socially sustainable agriculture. Final report, synthesis and recommendations]. *PW 2005-2009 No. 175*. Warszawa: IERiGŻ-PIB, p. 13.
6. IERiGŻ-PIB, (2016). Rynek mleka, stan i perspektywy [Milk market, state and prospects]. *Kwiecień*, p. 11.
7. IERiGŻ-PIB, (2017). Rynek Rolny, Analiza, Tendencje, Oceny [Agricultural Market, Analysis, Trends, Ratings]. *Biuletyn miesięczny No. 10* (320).
8. Polska Federacja Hodowców Bydła i Producentów Mleka [Polish Federation of Cattle Breeders and Milk Producers], (2018). Ocena i hodowla bydła mlecznego- Dane za rok 2017 [Evaluation and breeding of dairy cattle - data for 2017].

9. www.bureaveritas.pl, update date 02.02.2019
10. www.portalspozywczy.pl/tagi/rynek-mleka, update date 02.02.2019
11. www.topagrar.pl, update date 04.02.2019
12. www.regiohurt.pl, PFHBiPM, update date 25.01.2019
13. www.mleczarstwo.com, update date 25.01.2019
14. Raporty Społeczne Danone [Danone Social Reports], 2006-2009, 2010-2012, 2018.
15. spomlek.pl, update date 25.01.2019
16. osmkolo.pl, update date 25.01.2019
17. mlekovita.com.pl, update date 25.01.2019
18. mlekpole.com.pl, update date 25.01.2019
19. osm-sierpc.pl, update date 25.01.2019
20. piatnica.com.pl, update date 25.01.2019
21. www.danone.pl, update date 25.01.2019
22. hochland.pl, update date 25.01.2019.

FINANCIAL EXPENSES OF EU STRUCTURAL FUNDS IN RURAL AREAS IN POLAND

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Abstract. The main aim of the paper is to compare and assess the structure and value of implemented projects co-financed by EU funds in perspective 2007-2013 in rural areas in comparison to the urban ones. The objectives of the study were to classify investment priorities assigned to each project into smaller number of homogenous groups and to identify the share of EU funded projects in the different types of areas. Desk research, review of literature and databases, statistical and descriptive methods were used. The material used was database of projects implemented in the period 2007-2016 co-financed by EU structural funds in the programming period 2007-2013 as of June 2018. Polish rural areas have had the highest share of funds (above 10 %) allocated on construction of transport infrastructure, developing energy infrastructure, social infrastructure; and projects enhancing nature, tourism and cultural development. The proportions between the allocation in urban and rural areas were uneven - in most cases much more funds were spent in the cities and towns, which is clearly connected with the polarization - diffusion model of Polish regional policy.

Key words: EU structural funds, rural areas, effects, expenses, investment priorities, Poland.

JEL code: O18, R42.

Introduction

One of the European Union's aims is equalizing differences in the level of development of the Member States in the field of social, spatial and economic development. European funds are the basic instruments for implementing the European Union's regional policy (Pawlicki, 2014). Poland is one of the largest beneficiaries of EU funds, as in the period 2014-2020, the EU allocated to Poland 82.5 billion EUR.

As there are few studies on the use of EU funds in rural areas (Schrader, 1994; Zawisza & Pachut, 2015; Pondel, 2017) or the studies concern mostly on the development and impact on agriculture (Kowalczyk, 2007; Satola, 2009), the author decided to analyse the differences in the EU funds absorption and their financial expenses and effects in rural and urban areas. The objectives of the study were to classify investment priorities assigned to each project into smaller number of homogenous groups and to identify and assess the structure and value of implemented projects co-financed by EU funds in perspective 2007-2013 in rural areas in comparison to the urban ones. As a background, description of EU funds and strategic goals and the system of implementation of cohesion policy in Poland was shown.

Desk research (review of literature and databases, ordering, classification of projects), statistical methods (calculations, relative and absolute indicators), field observations and descriptive methods were used, the data were presented using tables and graphs elaborated with Excel software.

The material used was database of projects implemented in the period 2007-2016 supported by all co-financed by EU structural funds domestic programs as of June 2018 downloaded from the national website concerning EU funding in Poland (funduszeuropejskie.2007-2013.gov.pl, 2018). Two programs were excluded from the study: Human Capital Program and Programs of European Territorial Cooperation because the databases made it impossible to identify the share of funds spent in rural and urban areas. The data were published by Ministry of Economic Development of the Republic Poland (MED). During the analysis of Polish database, the author sometimes came across errors in project classification, so some of the results should be treated with caution. The project types were analysed and classified into the following groups according to the given in database

investment priorities: Innovations and entrepreneurship, ICT, Transport, Energy, Environment protection, Nature, tourism and culture, Social infrastructure, Other.

EU funds and their implementation in Poland in the period 2007-2013

Structural funds are an instrument of European Union's regional and cohesion policy used to reduce regional differences (Bachtler J., Turok I., 2013). Among many financial instruments, the EU has the following five main funds supporting the economic development of countries in line with the Europe 2020 strategy and its objectives. The first of these funds is the European Regional Development Fund (ERDF), which aims to reduce disparities in the levels of development of regions in the European Union and is intended to strengthen economic, territorial and social cohesion. Funds from this fund are earmarked, among others, for supporting infrastructure and production investments as well as support for small and medium-sized enterprises. The second fund is the European Social Fund (ESF), whose main goal is to combat unemployment among member countries. Funds from this fund increase employment and education opportunities. Support for social groups and regions is also co-financed, and is especially dedicated to young people entering the labour market. Another fund is the Cohesion Fund, whose funds are earmarked for member states whose gross national income per capita is less than 90 % of the EU average. The purpose of this fund is to reduce economic and social disparities as well as to promote sustainable development through investments in transport infrastructure and environmental protection. The fourth fund is the European Agricultural Fund for Rural Development, whose task is to support transformations in the structures of agriculture as well as to support development in rural areas. The last fund is the European Maritime and Fisheries Fund, supporting the restructuring of fisheries in the member states. In addition to the structural funds and the Cohesion Fund described above, in the programming period 2007-2013 there were also Community Initiatives: JASPERS providing technical support during the preparation of significant infrastructure projects, JESSICA supporting sustainable urban development and JEREMIE aiming at support for the activities of small and medium-sized enterprises. In this paper, support by CF, ERDF and ESF will be assessed.

The assistance discussed in the article in the period 2007 - 2013 was intended to achieve the objectives of the Lisbon Strategy and regional policy strategies, which were designed to decrease differences in the levels of regional development. The strategy of socio-economic development of Poland revealed itself in such challenges as: building a competitive economy, increasing investments in human capital, improving road infrastructure, protecting the natural environment, or creating conditions for appropriate economic growth. In Poland, the National Strategy for Cohesion (NSS) (official name: National Strategic Reference Framework, NSRF) was the strategic document defining the priorities and areas of use and the system of implementing EU funds. It set out the rules for spending the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund under the Community budget for 2007-13.

The strategic goal of NSS was to create conditions for the growth of competitiveness of the Polish economy based on knowledge and entrepreneurship, ensuring employment growth and increasing the level of social, economic and spatial cohesion. The strategic goals were to be achieved through the implementation of horizontal specific objectives (NSRO, 2007):

- Improving the quality of public institutions' functioning and developing partnership mechanisms,
- Improving the quality of human capital and increasing social cohesion,

- Construction and modernization of technical and social infrastructure essential for the growth of Poland's competitiveness,
- Increasing the competitiveness and innovativeness of enterprises, in particular the manufacturing sector with high added value and the development of the services sector,
- Increasing competitiveness of Polish regions and counteracting their social, economic and spatial marginalization,
- Equalizing development opportunities and supporting structural changes in rural areas.

The investment priorities set in Poland and the share of funds for were similar to other countries in the region. For example, in all V4+4 countries the biggest part of the allocation was invested in transportation, energy and environmental projects (The Impact of Cohesion Policy..., 2017). Investments in innovations, companies, R&D potential was a priority in the Czech Republic and Slovenia, while in Poland transport projects have had the highest share.

In addition to legal, fiscal and institutional activities, NSS objectives were implemented through programs (so-called operational programs) managed by the Ministry of Regional Development, regional programs (so-called regional operational programs) managed by the Management Boards of individual Voivodships and projects co-financed by the structural instruments, i.e. :

- Infrastructure and Environment Program – co-financed by ERDF and CF
- Innovative Economy Program – ERDF,
- Human Capital Program – ESF,
- 16 regional programs – ERDF,
- Program Development of Eastern Poland – ERDF,
- Technical Assistance Program – ERDF,
- Programs of European Territorial Cooperation – ERDF.

In this paper, support by all the above mentioned programs without Human Capital Program and Programs of European Territorial Cooperation will be assessed.

Research results and discussion

1. The types and structure of implemented projects

Investment priorities assigned to each project were classified into 8 groups. The names of these groups and their components (with numbers indicating priorities) are shown below in the Tab. 1.

Table 1

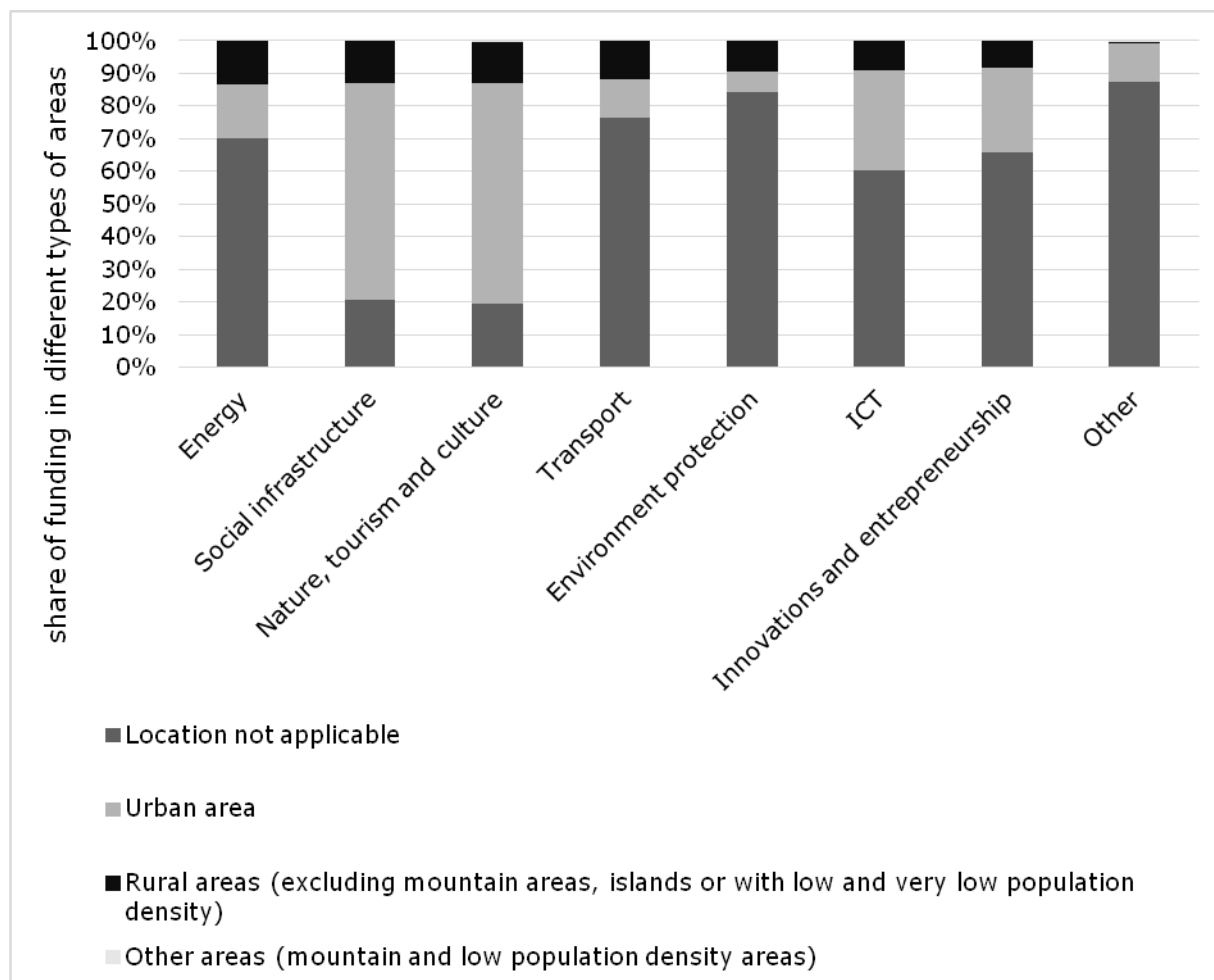
The types of EU co-financed projects according to the investment priorities

Types of intervention	Investment priorities
Innovations and entrepreneurship	01 R&D activities carried out in research centres, 02 R&D infrastructure and specialized centres of technological competence, 03 Technology transfer, 04 Support for the development of R&D, 05 Advanced support services for enterprises and groups of enterprises, 06 Support for SMEs in the promotion of environmentally friendly products and processes, 07 Investments in enterprises directly related to the field of research and innovation, 08 Other investments in enterprises, 09 Other activities to stimulate research, innovation and entrepreneurship in SMEs
ICT development	10 Telecommunications infrastructure (including broadband networks), 11 Information and communication technologies, 13 E-services and applications for citizens, 14 Services and applications for SMEs, 15 Other actions to improve access to ICT for SMEs and their efficient use
Transport	16 Railway, 18 Railway rolling stock, 20 Highways, 22 National roads, 23 Regional / local roads, 24 Bicycle paths, 25 Urban transport, 26 Multimodal transport, 28 Intelligent transport systems, 29 Airports, 30 Ports, 31 Inland waterways (regional and local)
Energy	33 Electricity, 35 Natural gas, 39 Renewable energy: wind, 40 Renewable energy: solar, 41 Renewable energy: biomass, 42 Renewable energy: hydroelectric, geothermal and other, 43 Energy efficiency, combined production (cogeneration), energy management
Environment protection	44 Municipal and industrial waste management, 45 Water management and drinking water supply, 46 Wastewater treatment, 47 Air quality, 48 Integrated pollution prevention and control system, 50 Restoration of industrial areas and reclamation of contaminated land, 51 Promoting biodiversity and nature protection (including NATURA 2000), 52 Promoting clean urban transport, 53 Prevention of risks, 54 Other activities for environmental protection and risk prevention
Nature, tourism and culture	55 Promoting natural values, 56 Protection and valorisation of the natural heritage, 57 Other support for strengthening tourism services, 58 Protection and preservation of cultural heritage, 59 Development of cultural infrastructure, 60 Other support for improving cultural services, 61 Integrated projects for the revitalization of urban and rural areas
Social infrastructure	75 Infrastructure of the education system, 76 Health care infrastructure, 77 Care and education infrastructure, 78 Housing infrastructure, 79 Other social infrastructure
Other	73 Actions to increase participation in education and training throughout life, 80 Promoting partnerships, pacts and initiatives, 81 strengthening the ability to implement policies and programs, 85 Preparation, implementation, monitoring and control, 86 Evaluation, research / expertise, information and communication

Source: author's elaboration based on data by MED of Poland

The structure of value of implemented projects co-financed by EU funds in perspective 2007-2013 in different types of areas was presented in Fig. 1. In many cases, the location was not assigned to the projects by beneficiaries (location: not applicable), which makes it difficult to draw conclusions properly. This happened mainly by projects with a broad range of influence like promotion, prevention of digital exclusion through the construction of broadband internet infrastructure, technical infrastructure construction and scientific projects. In other cases containing social infrastructure, nature, tourism and cultural projects and ICT development the location was assigned to most projects. Anyway, the rural areas have had the highest share of funds (above 10 %) allocated on developing energy infrastructure, social infrastructure; and projects enhancing nature, tourism and cultural development and construction of transport infrastructure (definition and scope of the term transport Infrastructure is described by the EC (2006). Interesting are also proportions between the allocation in urban and rural areas – in most cases much more funds were spent in the cities and towns. The urban areas acquired 5.5 times more on social infrastructure and nature tourism and

cultural projects and 3 times more on innovations and entrepreneurship and ICT development. This is clearly connected with the polarization - diffusion model of cohesion policy implementation recognizing that it is more important to support the metropolis and stimulate the diffusion of development to the surrounding areas (Wozniak, 2011; Rakowska, 2011). Only shares of funds allocated to transport and energy were similar in both types of areas. The only type of projects where more funds were spent in the rural areas was environment protection (9.5 % share in the rural and 6.1 % in the urban areas). The effect of this was a significant development of technical infrastructure in rural areas in Poland (mainly Central and Eastern). In many areas that have been lagging behind in infrastructure so far water systems, wastewater treatment plants and sewage systems were built.



Source: author's calculation based on data by MED of Poland

Fig. 1. The structure of value of implemented projects co-financed by EU funds in perspective 2007-2013 in different types of areas in Poland

2. Highest share of funding in rural areas – detailed analysis

The share of projects in the rural areas taking into account detailed classification of investment priorities was shown in Tab. 2. Both the share and total value of projects were presented. As it can be observed, rural areas benefited mostly (the highest share of allocated funds: >50 %) from technical and social infrastructure projects as construction of bicycle paths, regional and local roads, enhancing water management systems, also care and education infrastructure.

Table 2

**The share of rural areas in Poland as beneficiaries of EU co-financed projects
 by investment priorities (financial perspective 2007-2013)**

No	Investment priority (number and name)	share of funds in rural areas (%)	total amount of funding (m PLN)
1	24 Bicycle paths	88.8	357.6
2	45 Water management and drinking water supply	69.3	382.1
3	77 Care and education infrastructure	66.4	50.7
4	40 Renewable solar energy	66.0	590.1
5	23 Regional / local roads	57.8	10532.0
6	54 Activities for environmental protection and risk prevention	55.1	117.5
7	42 Renewable energy: hydroelectric, geothermal and other	46.3	58.6
8	55 Promoting natural values	43.3	45.9
9	06 Support for SMEs in the promotion of environmentally friendly products and processes	38.7	88.3
10	56 Protection and valorisation of the natural heritage	38.4	60.6
11	79 Other social infrastructure	34.1	349.2
12	10 Telecommunications infrastructure	33.0	1117.8
13	08 Other investments in enterprises	33.0	2852.0
14	58 Protection and preservation of cultural heritage	19.3	380.2
15	57 Other support for strengthening tourism services	19.0	785.1
16	75 Infrastructure of the education system	17.1	1022.9
17	09 Other activities to stimulate R&D and entrepreneurship	15.8	412.8
18	46 Wastewater treatment	15.2	2323.8
19	16 Railways	15.0	1047.2
20	29 Airports	13.0	313.0
21	43 Energy efficiency, combined production (cogeneration), energy management	11.8	352.1
22	39 Renewable energy: wind	11.6	169.3
23	53 Prevention of risks (natural hazards)	10.6	486.2
24	51 Promoting biodiversity and nature protection (including NATURA 2000)	10.1	52.5
25	44 Municipal and industrial waste management	8.3	377.2

Source: author's calculations based on data of Ministry of Economic Development of Poland

More than 1 billion PLN was spent in the rural areas for regional and local roads or railways, telecommunications infrastructure (mainly enhancing internet access, developing broadband networks), infrastructure of the education system (schools and their equipment) or wastewater treatment. Apart from infrastructure more than 2.8 billion PLN was spent on investments in enterprises located in the rural areas, which helped them to increase their competitiveness and develop new activities. Important expenditures have been incurred for activities for environmental protection and risk prevention and promoting natural values. A significant share of funds contributed to support for strengthening tourism services, protection and preservation of cultural heritage and protecting biodiversity and nature protection (including NATURA 2000 areas).

Conclusions, proposals, recommendations

The paper briefly compared and assessed the structure and value of implemented projects co-financed by EU funds in perspective 2007-2013 in rural areas in comparison to the urban ones in

Poland. In general, the structure of allocated funds at the country level was comparable to other Eastern European countries. To assess and analyse the financial expenses of EU funds the investment priorities were classified and the share of projects completed in the rural areas in selected categories was calculated. The main conclusions are stated below.

- 1) Polish rural areas benefited mostly (the highest share of allocated funds: >50 %) from technical infrastructure projects as construction of bicycle paths, regional and local roads, enhancing water management systems.
- 2) Another important effect was development of social infrastructure as care and education infrastructure.
- 3) Investments in enterprises located in the rural areas helped them to increase their competitiveness and develop new activities.
- 4) The urban areas acquired 3-5 times more funds on social infrastructure and nature tourism and cultural projects, innovations and entrepreneurship and ICT development. This is clearly connected with the location of enterprises (mainly in cities) and polarization - diffusion model of cohesion policy in Poland.
- 5) The only type of projects where more funds were spent in the rural areas was environment protection (which is connected with an enormous development of technical infrastructure).
- 6) The projects' effects contributed to achieving the following goals of National Cohesion Strategy: Construction and modernization of technical and social infrastructure essential for the growth of Poland's competitiveness (although it has had the higher effect in increasing the life quality), and Increasing the competitiveness and innovativeness of enterprises.

As one can see, the support of EU structural funds for rural areas in Poland was very important, but much smaller than in urban areas. Further studies could be focused on the deepened analysis of the effects of the projects increasing the level of economic development both at country level and in local rural systems.

Bibliography

1. Bachtler, J., Turok I. (eds.). (2013), *The Coherence of EU Regional Policy: Contrasting Perspectives On The Structural Funds*. Routledge. London & New York, p. 441.
2. Commission Regulation (EC) No 851/2006 of 9 June 2006 Specifying The Items to Be Included Under The Various Headings In The Forms Of Accounts Shown In Annex I To Council Regulation (EEC). Retrieved: <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006R0851&from=PL>. Access: 18.12.2018.
3. Kowalczyk S. (2007), Fundusze Unii Europejskiej w rozwoju rolnictwa i obszarow wiejskich. (Funds of The European Union In The Development Of Agriculture And Rural Areas). *Zagadnienia Ekonomiki Rolnej* 2007 No 3, pp. 3-23.
4. Ministry of Economic Development of the Republic Poland, Database of EU-Cofinanced Projects In Poland. Retrieved: <http://funduszeuropejskie.2007-2013.gov.pl> Access: 10.11.2018.
5. Pawlicki R., (2014). *Strategia Finansowa dla Polski 2014-2020. Fundusze unijne dla przedsiębiorczych*. (Financial Strategy for Poland 2014-2020. EU Funds for Enterprising). Difin, p. 254.
6. Polska. Narodowe Strategiczne Ramy Odniesienia 2007-2013 wspierające wzrost gospodarczy i zatrudnienie. Narodowa Strategia Spójności. (National Strategic Reference Framework 2007-2013 Supporting Economic Growth and Employment. National Cohesion Strategy). Dokument zaakceptowany decyzją Komisji Europejskiej zatwierdzająca pewne elementy Narodowych Strategicznych Ram Odniesienia. Ministerstwo Rozwoju Regionalnego. Warszawa, maj 2007 r.
7. Pondel, H., (2017). Fundusze Unii Europejskiej jako czynnik wspierający zrownawozony rozwój obszarow wiejskich. (Funds of The European Union As A Factor Supporting Sustainable Development Of Rural Areas). *Studia Oeconomica Posnaniensia* 2017, Vol. 5, No. 5, pp. 88-102.
8. Rakowska J., (2011). Praktyczne znaczenie zastosowania wyrównawczego lub polaryzacyjno-dyfuzyjnego modelu rozwoju regionalnego dla obszarow wiejskich w Polsce po 2013 roku, (The Practical Significance Of Applying A Compensatory Or Polarization-Diffusion Model Of Regional Development For Rural Areas In Poland After 2013). *Wies jutra* 11/12 (160/161), pp. 26-27.

9. Satola, L., (2009). Przestrzenne zroznicowanie absorpcji funduszy strukturalnych przeznaczonych na rozwój pozarolniczej dzialalnosci na obszarach wiejskich. (Spatial Differentiation in The Absorption Of Structural Funds Assigned To Financing The Development Of Non-Agricultural Activities In Rural Areas). *Zeszyty Naukowe SGGW w Warszawie seria Problemy rolnictwa swiatowego*, t. 7(XXII), pp. 133-142.
10. Schrader, H., (1994). Impact assessment of the EU structural funds to support regional economic development in rural areas of Germany, *Journal of Rural Studies*. Volume 10, Issue 4, October 1994, pp. 357-365. [https://doi.org/10.1016/0743-0167\(94\)90045-0](https://doi.org/10.1016/0743-0167(94)90045-0)
11. The Impact of Cohesion Policy 2007–2013 in Poland, Visegrad Group Countries And Partner States, (2017). Ministry of Economic Development, Warsaw, p. 73.
12. Wozniak, J. (2011). *Miejsce polskich regionow w systemie rozwoju*. (The Place of Polish Regions In The Development System) [at:] Kolczynski, M., Zuber, P. (eds.) Nowy paradygmat rozwoju – najnowsze trendy i perspektywy rozwoju polityki regionalnej. Ministerstwo Rozwoju Regionalnego, Warszawa, pp. 48-57.
13. Zawisza, S., Pachut, T., (2015). Wplyw integracji z Unia Europejska na rozwoj obszarow wiejskich gminy Nowa Wies Wielka. (Influence Of Integration With The European Union On The Development Of Rural Areas In Nowa Wies Wielka Commune). *Roczniki Naukowe SERiA* tom XVII zeszyt 5, pp. 361-366.

ENTREPRENEURIAL ATTITUDES AND THE LEVEL OF INNOVATIVENESS OF EUROPEAN COUNTRIES

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Abstract. This paper analysed the relations between entrepreneurial attitudes among the citizens of European countries and the results of economies in the field of innovativeness. Data published in the Global Entrepreneurship Monitor (GEM) and European Innovation Scoreboard (EIS) were used to assess these relations. It was demonstrated that the citizens of countries with a higher innovativeness ratio demonstrate weaker entrepreneurial intentions (intentions to start a business within three years). Paradoxically, in more innovative countries, in spite of a stronger perception of opportunities to start a new firm, weaker intentions to start a business are also observed, which may result from greater attractiveness of remunerated employment as well as a more critical assessment of their skills and knowledge of starting a business.

Key words: entrepreneurial attitudes, innovativeness, European countries.

JEL code: O31.

Introduction

According to subject-related literature, innovativeness is strictly connected with entrepreneurship (Glinka B., 2008, Domurat A., 2011). The crucial role of cultural factors, including entrepreneurial attitudes, is particularly emphasized in establishing innovativeness (Gupta V. et. al., 2004, Gomez-Haro S. et al., 2011). The relationship between entrepreneurial attitudes and the innovativeness of economies results from the importance of these cultural attitudes, potentially influencing the possibility to motivate the entire society to innovativeness and inventiveness in order to create an innovative society (Kwiatkowski S., 2000). It can be claimed that culture supports and preserves entrepreneurial activities within an organization and combines entrepreneurial behaviours while searching for occasions to bring innovations to life (Dimitratos P. et. al., 2012). In this way, the culture emphasizing and supporting entrepreneurial efforts influences the quality and quantity of innovation at a national level (Baker W., Sinkula J., 1999; Wai H., Yeung C., 2002). This results from the fact that an environment encouraging entrepreneurship may motivate an individual to creativity, and shape their entrepreneurial style of functioning.

The literature quoted provides numerous justifications confirming the thesis on positive relations between entrepreneurship and innovativeness. However, there are no studies emphasizing the relationships between entrepreneurial attitudes and the innovativeness of countries. Due to the research gap in this field, the purpose of the paper was formulated, i.e. studying the relations between entrepreneurial attitudes of the citizens of European countries and the results of economies in the field of innovativeness measured with the SII value. Due to geographical proximity and cultural resemblance (European civilization circle), the present article concentrated on an analysis of relations between the studied variables in European countries.

In the research were formulated certain tasks. The first task of this research was to collect data concerning entrepreneurial attitudes of the citizens of European countries published in the Global Entrepreneurship Monitor (GEM). The second task was to assemble data concerning innovativeness of countries published by European Innovation Scoreboard (EIS). Then, as the third task, to analyse the relations between entrepreneurial attitudes among the citizens of European countries and the results of economies in the field of innovativeness.

Research results and discussion

Economic analyses treat entrepreneurship as a phenomenon with an exclusively economic character, in which major roles are played by: capital, labour supply, access to markets, resources and technology (Glinka B., 2008; Berger B., 1994). The mainstream of economic studies (neo-Classic approach) is based on the axiom of a rational individual (*homo oeconomicus*), who aims at maximizing profits. Many times, analyses referring to the cultural context of entrepreneurship are marginalized (Glinka B., 2008). Full understanding of the phenomenon of entrepreneurship should take into account cultural factors, which may constitute support for entrepreneurial activities or impede them. Cultural explanations are usually quoted when other, „harder“ variables fail (Marody M., Kochanowicz J., 2010). The ways of thinking about entrepreneurship, attitudes towards entrepreneurs as well as the forms in which they are manifested are strongly rooted in the cultural context. This context suggests certain ideas and concepts of entrepreneurship, which are often treated as obvious patterns for action (Polak K., Haber A., 2011). Cultural diversity makes it possible, for example, to partially explain the differences in economic results of post-communist countries (Marody M., Kochanowicz J. 2007).

Entrepreneurial bases, which may be considered as elements of the culture of entrepreneurship, are treated as the driving force for innovative transformations within products and processes (Bratnicki M., Struzyna J., 2001). The most desired type of entrepreneurship – ambitious, developing, using new technologies – leads to innovative solutions. Ambitious entrepreneurship referring to entrepreneurial activities based on innovations constitutes the most important factor for economic development and civilizational progress (Glinka B., Gudkova S., 2011; Cieslik J., 2006). Innovative entrepreneurship refers mainly to transgressive activities in dynamic and risky environment (Strzalecki A., 2011). The analyses of innovative entrepreneurship should thus take into account its cultural determinants (Domurat A., 2011).

It is worth noting that, in literature, there is no full consent in the context of perception of entrepreneurship. For example, P. Drucker (1992) claimed that not every activity connected with risk and the company's development may be described as entrepreneurial. A crucial factor in entrepreneurship consists in creative reaction to changes in the environment or the enterprise. Following Drucker's approach, entrepreneurship is questioned when it is connected with introducing a non-innovative good or service, e.g. opening a repair garage, a commercial company, a new bar or restaurant. Schumpeter also referred the notion of entrepreneurship to very creative activities (creative destruction), being a source of imbalance on the market. Nevertheless, a broad approach dominates in literature, according to which each new market undertaking (e.g. establishing new companies) is an entrepreneurial activity. I. Kirzner (2001) claims that entrepreneurial activities are also those which refer to price competition which do not involve creative destruction and innovativeness. An entrepreneur is, following a broader perspective, an entity discovering new market opportunities.

Entrepreneurial attitudes of citizens are thus crucial for the development of entrepreneurship. They translate into better identification of market occasions, valuation of business ideas, perception of ideas and creative behaviour styles and creativity (Strzalecki A., 2007; Strzalecki A., Domurat A., 2009). An enterprise or work stimulating innovativeness may shape creative attitudes and new behaviours leading to innovativeness. The research conducted in this field by A. Domurat (2011) showed that those who display an entrepreneurial spirit at work, including entrepreneurs and the persons often behaving in an innovative way, manifest a more favourable attitude towards innovative

business ideas compared to those deprived of the entrepreneurial spirit (full-time employees and those who do not manifest innovativeness at work, respectively). It can thus be suspected that there exists a correlation between entrepreneurial attitudes and the innovativeness of employees which, in turn, translates into the innovativeness of entire economies.

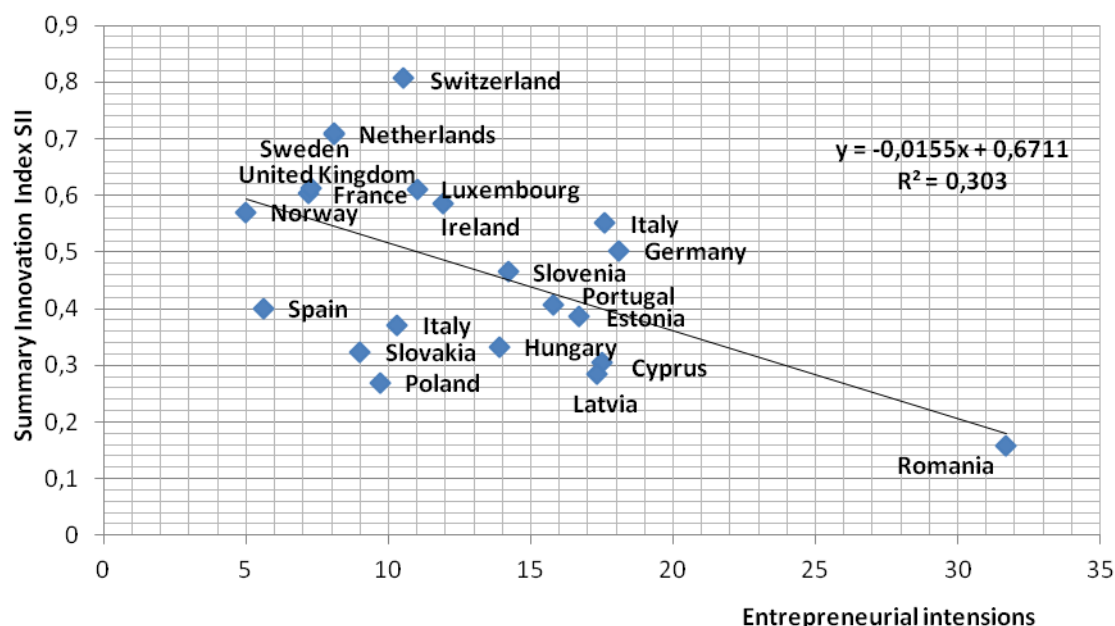
In order to assess the relations between entrepreneurial attitudes among the citizens of European countries and the innovativeness of countries, data published in the Global Entrepreneurship Monitor (GEM) and European Innovation Scoreboard (EIS) was applied.

GEM provides primary data-based measurement and assessment tools of all forms of entrepreneurship. The GEM conceptual framework identifies social, cultural, political and economic contexts in which individuals express their intentions and perform their entrepreneurial activities. Entrepreneurial attitudes were measured with the use of four factors, including:

- 1) entrepreneurial intentions, which means the percentage of the population aged between 18 and 64 years (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within three years;
- 2) perceived opportunities, which means the percentage of the population aged between 18 and 64 years who see good opportunities to start a firm in the area where they live;
- 3) perceived capabilities – the percentage of the population aged between 18 and 64 years who believe they have the required skills and knowledge to start a business;
- 4) fear of failure – the percentage of the population aged 18-64 years perceiving good opportunities who indicate that a fear of failure would prevent them from starting up a business.

The factor used to reflect the level of innovativeness of countries was the Summary Innovation Index (SII). The overall performance of each country's innovation system has been summarised in this composite indicator. The results of SII are published by the European Innovation Scoreboard (EIS), which uses the most recent statistics from Eurostat and other internationally recognised sources available at the time of analysis. International sources have been used in the reports wherever possible in order to ensure comparability between countries (European Innovation Scoreboard, 2018). The coefficients used for assessing the correlations between analysed variables were the Pearson correlation coefficient together with the R^2 coefficient constituting the measure of model adaptation quality, showing what percentage of one variable explains the changeability of the other variable. Its value is from 0 to 1.

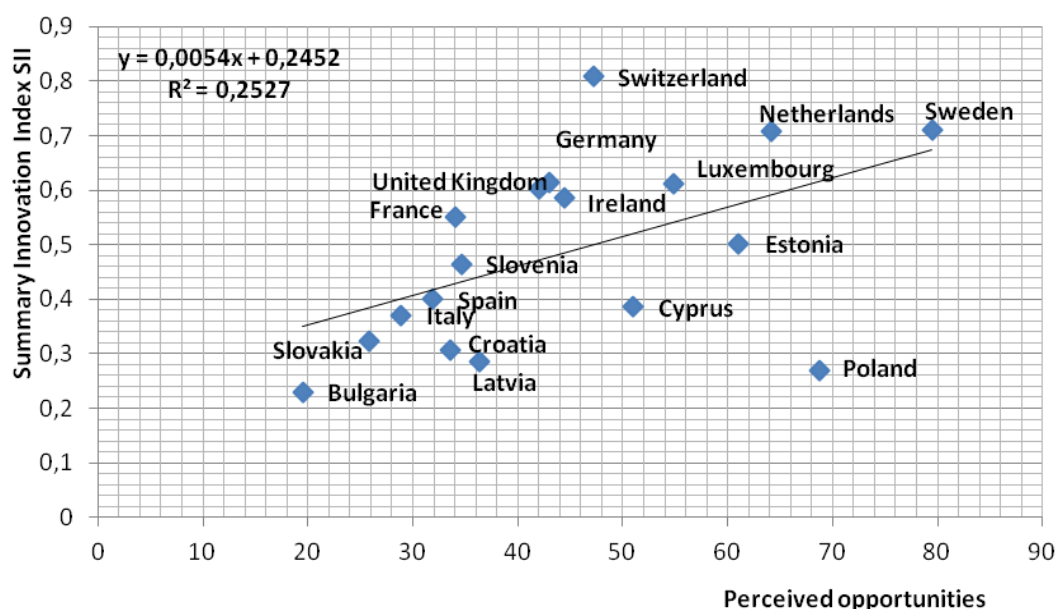
Entrepreneurial intentions were the first entrepreneurial attitude analysed in relation to the innovativeness of countries. The results of analysis referring to the relation between entrepreneurial intentions and Summary Innovation Index (SII) demonstrated that there exists a moderate negative correlation ($r=0.55$) between these variables. This means expressing weaker entrepreneurial intentions by the countries characterized by higher innovativeness indicator (Fig. 1). This confirms a general trend observed in all countries around the world, where the desire to become an entrepreneur generally decreases together with reaching a higher development phase (Global Entrepreneurship Monitor Polska, 2015). The observed correlation should not be treated as an absolute rule, as the citizens of some countries with similar SII coefficient are characterized by a diversified level of entrepreneurial intentions. For example, relatively strong entrepreneurial intentions are observed in Germany, characterized by high SII coefficient. Among European countries, the highest level of entrepreneurial intentions is observed in Romania, which also shows the lowest SII, which confirms the negative relationship between the analysed variables.



Source: author's calculations based on Global Entrepreneurship Monitor 2017/2018, European Innovation Scoreboard 2018

Fig. 1. Correlation between entrepreneurial intentions and Summary Innovation Index (SII)

Another element of the analysed entrepreneurial attitudes is perceived opportunities, referring to the percentage of the population aged between 18 and 64 years who see good opportunities to start a firm in the area where they live. It was observed that in European countries, together with the increase in SII, perceived opportunities to start a firm are also higher (Fig. 2). This correlation is reflected in the value of the Pearson coefficient $r=0.50$.



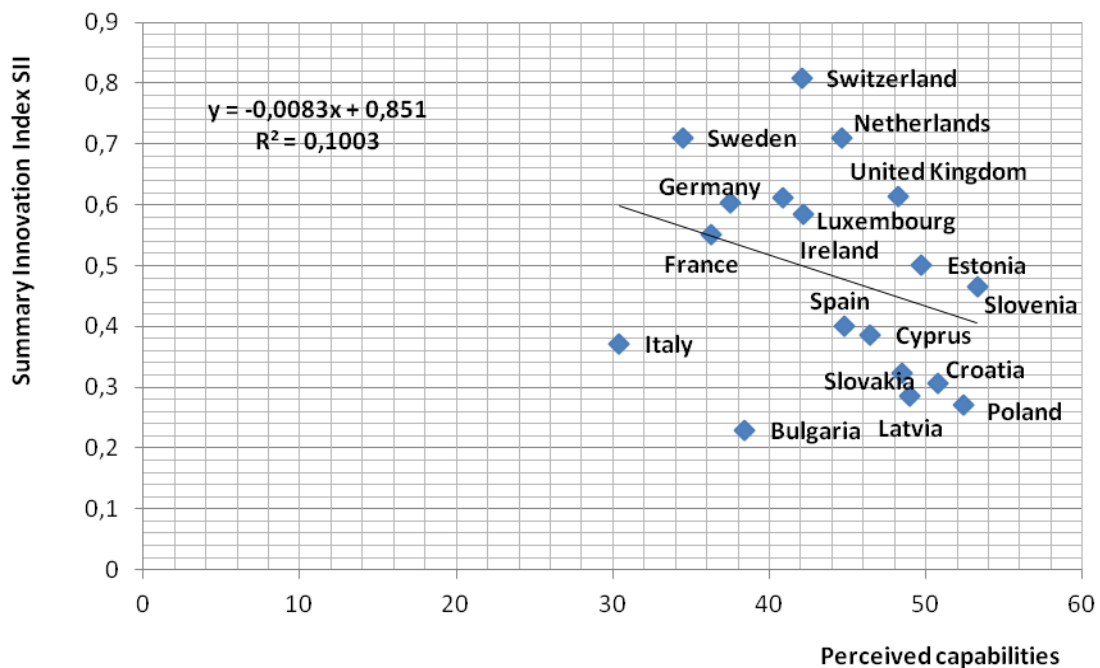
Source: author's calculations based on Global Entrepreneurship Monitor 2017/2018, European Innovation Scoreboard 2018

Fig. 2. Correlation between perceived opportunities and Summary Innovation Index (SII)

Sweden, a country with one of the highest SII values, has the highest number of inhabitants who noticed an opportunity to start a firm. Poland constitutes a certain exception here, as it has a relatively low SII value compared to the perception of opportunities to start a firm. It can thus be assumed that noticing development opportunities for a new firm in this country constitutes an element of the

entrepreneurial base supporting the establishment of new entities. It is worth noting that when not taking Poland into account in analysing the interdependencies, the correlation coefficient would be moderately high and would amount to $r=0.70$. In the European countries, the lowest SII value together with the weakest perceived opportunities, was observed in Bulgaria.

Another element reflecting entrepreneurial attitudes– perceived capabilities – determines the percentage of population aged between 18 and 64 years who believe they have the required skills and knowledge to start a business. The relation of these attitudes expresses a weak negative correlation ($r=-0.32$) with the level of innovativeness in the countries (Fig. 3). This means that the citizens of countries characterized by higher SII value assess their skills and knowledge to start a business less positively. It is possible that the markets in these countries are more mature, and the citizens adopt a more critical approach towards their skills and knowledge in connection with starting a new undertaking. It is, however, necessary to observe that differences are not high between the citizens of European countries in considering perceived capabilities. The citizens of Slovenia and Poland assess their skills the most positively, while the most negative assessment is attributed to the inhabitants of Italy.

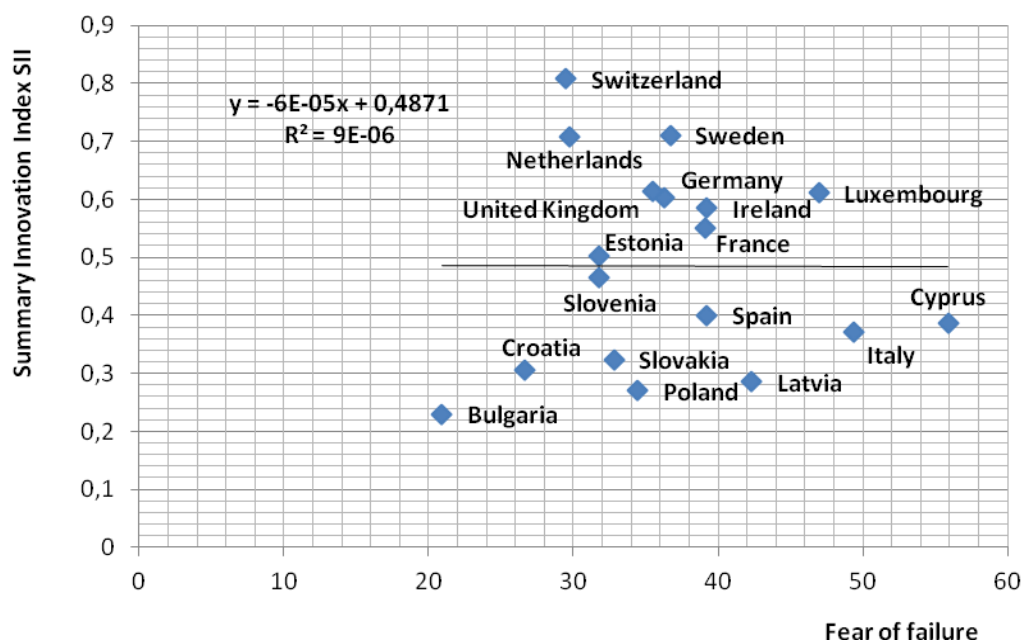


Source: author's calculations based on *Global Entrepreneurship Monitor 2017/2018, European Innovation Scoreboard 2018*

Fig. 3. Correlation between perceived capabilities and Summary Innovation Index (SII)

For the last of the analysed entrepreneurial attitudes – the fear of failure – No correlation was reported between it and the level of innovativeness measured using SII ($r=0.00$). It can thus be assumed that perceiving a fear of failure does not depend on the innovativeness of economies (Fig. 4).

The citizens of Cyprus and Italy express the highest fear of failure in connection with a new undertaking, while it is the lowest among the citizens of Bulgaria. Nevertheless, even if the Bulgarians are not afraid to fail, they do not perceive the opportunity to start a new firm in their area of living. A relatively low fear of failure is demonstrated by the citizens of such countries as Switzerland and the Netherlands and their SII value remains high.



Source: author's calculations based on Global Entrepreneurship Monitor 2017/2018, European Innovation Scoreboard 2018

Fig 4. Correlation between fear of failure and Summary Innovation Index (SII)

Conclusions, proposals, recommendations

The analysis performed referred to relations between entrepreneurial attitudes of the citizens of European countries and the level of innovativeness of economies. Based on the conducted empirical research, the following conclusions were formulated.

- 1) The citizens of countries characterized by higher innovativeness coefficient express weaker entrepreneurial intentions (intention to start a business within three years). This may result from many different factors, among which the crucial factor is probably greater attractiveness of remunerated employment in these countries compared to less-developed countries, characterized by a lower level of innovativeness.
- 2) It was found that in the European countries, together with the increase in SII value, the percentage of the population who see good opportunities to start a new firm in the area where people live (perceived opportunities) is also high. It can thus be claimed that conditions resulting from the economic, institutional and legal environment in these countries are more favourable for entrepreneurship and (at the same time) innovativeness, in comparison to the countries is characterized by lower level of innovativeness. At the same time, paradoxically, as it has been mentioned in the previous point, in more innovative countries, in spite of a stronger perception of the opportunities to start a new firm, weaker intentions to start a business were recorded.
- 3) It was also demonstrated that the citizens of countries characterized by higher SII value assess their skills and knowledge to start a business more critically, which probably has a negative impact on the intentions of the citizens of these countries to start a business.
- 4) Based on the conducted analysis, it can also be stated that the perceived fear of failure does not depend on the level of innovativeness of economies.
- 5) An important premise for economic policies of countries characterized by a lower innovativeness coefficient resulting from the conducted research involves the necessity to take into consideration the factors shaping entrepreneurial attitudes, particularly those connected with the perception of the opportunities to start a business. This is connected with the shaping of

institutional and legal (as well as economic and cultural) conditions favourable for entrepreneurship, which are the bases for entrepreneurship, including innovative entrepreneurship.

Bibliography

1. Baker, W.E., Sinkula, J.M. (1999). Learning Orientation, Market Orientation, and Innovation: Integrating and Extending Models of Organizational Performance; *Journal of Marketing Focus. Management*; 4 (4), pp. 295–308.
2. Berger, B. ed. (1994). *Kultura przedsiębiorczosci* (The culture of entrepreneurship). Warszawa: Oficyna Literatów „Roj”.
3. Bratnicki, M., Struzyna, J. (2001). *Przedsiębiorczosc i kapital intelektualny* (Entrepreneurship and intellectual capital). Katowice: Wydawnictwo Akademii Ekonomicznej w Katowicach.
4. Cieslik, J. (2006). *Przedsiębiorczosc dla ambitnych. Jak uruchomic wlasny biznes* (Entrepreneurship for ambitious individuals. How to launch your own business). Warszawa: Wyd. Akademickie i Profesjonalne.
5. Dimitratos, P., Voudouris, I., Plakoyiannaki, E., Nakos, G. (2012). International Entrepreneurial Culture - Toward a Comprehensive Opportunity-Based Operationalization Of International Entrepreneurship; *International Business Review*; Vol. 21, s. 708–721.
6. Domurat, A. (2011). *Przedsiębiorczosc a kreatywnosc i innowacyjnosc* (Entrepreneurship versus creativity and innovativeness). [in] *Innowacyjna przedsiębiorczosc-teorie, badania, zastosowania praktyczne, perspektywa psychologiczna*, A. Strzalecki, A. Lizurej (ed.). Warszawa: Wyd. Academica.
7. Drucker, P. F. (1992). *Innowacja i przedsiębiorczosc – praktyka i zasady* (Innovation and entrepreneurship – practice and rules). Warszawa: PWE.
8. European Innovation Scoreboard 2018. Retrieved: https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en. Access: 15.01.2019.
9. Glinka, B. (2008). *Kulturowe uwarunkowania przedsiębiorczosci w Polsce* (Cultural determinants of entrepreneurship in Poland). Warszawa: PWE.
10. Glinka, B., Gudkova, S. (2011). *Przedsiębiorczosc (Entrepreneurship)*. Warszawa: Wyd. Wolters Kluwer Polska.
11. Global Entrepreneurship Monitor 2017/2018. Retrieved: <https://www.gemconsortium.org/report>. Access: 15.01.2019.
12. Global Entrepreneurship Monitor Polska 2015. <http://www.pi.gov.pl/PARPFiles>. Access: 17.10.2018.
13. Gomez-Haro, S., Aragon-Correa, J.A., Cordon-Pozo E. (2011). Differentiating The Effects of The Institutional Environment On Corporate Entrepreneurship, *Management Decisions* 49 (9/10), pp. 1677–1693.
14. Gupta, V., MacMillan, I.C., Surie, G., (2004). Entrepreneurial Leadership: Developing and Measuring a Cross Cultural Construct, *Journal of Business Venturing* 19 (2), pp. 241–260.
15. Kirzner, I. (2010). *Konkurencja i przedsiębiorczosc (Competition and Entrepreneurship)*. Warszawa: Wyd. FIJORR.
16. Kwiatkowski, S. (2000). *Przedsiębiorczosc intelektualna (Intellectual Entrepreneurship)*. Warszawa: Wyd. Nauk. PWN.
17. Marody, M., Kochanowicz J. (2010). *Kultura i Gospodarka (Culture and Economy)*. Warszawa: Wyd. Naukowe Scholar.
18. Polak, K., Haber, A. (2011). Polskie spojrzenie na przedsiębiorczosc (A Polish perspective of entrepreneurship), *Harvard Business Review Polska*, 11, pp. 25–27.
19. Strzalecki, A. (2007). Tworczą przedsiębiorczosc i zarządzanie. Wyniki nowych badan psychologicznych (Creative entrepreneurship and management. Results of new psychological studies); *Prakseologia*(Praxeology), 147, pp. 163–188.
20. Strzalecki, A. (2011). *Style tworczonego zachowania w przedsiębiorczosci* (Creative behaviour styles in entrepreneurship), [in] *Innowacyjna przedsiębiorczosc. Teorie, badania, zastosowania praktyczne, perspektywa psychologiczna* (Innovative entrepreneurship. Theories, research, practical applications, psychological perspective); Strzalecki A. ed., Lizurej A. Warszawa: Wyd. Academica SWPS.
21. Strzalecki, A., Domurat, A. (2009). Model Stylu Tworczonego Zachowania a poziom innowacyjnosc przyszlej pracy studentow (Behaviour vs. the level of innovativeness of the students’ future job); *Czasopismo Psychologiczne* (Psychological Magazine), 15 (1), pp. 141–152.
22. Wai, H., Yeung, C., (2002). Entrepreneurship in International Business: An Institutional Perspective; *Asia Pacific Journal of Management*; 19 (1), pp. 29–61.

THE CONTRIBUTION OF THE LEADER APPROACH TO THE DEVELOPMENT OF RURAL AREAS IN LATVIA

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Abstract. The study was conducted with a purpose to find out a present role of the LEADER approach in development of the Latvian rural areas. The article consists of analysis of the LEADER approach in Latvia and other European countries, historical development and previously carried out evaluations of the LEADER results, the quantitative results for 2014-2020 period of the LEADER approach in Latvia. The Local Development Strategies (LDS) were analysed. Although the major needs of local communities identified by LAGs are linked to labour possibilities, infrastructure, knowledge and information, more important contribution of the LEADER projects was made in infrastructure development and not in strengthening of economic development. Nevertheless, the LEADER approach itself shows good results in facilitation of the local activities and thus looks perspective in future. It would be useful to use the multi-fund approach for the LAG support, which would facilitate development of the strategies according to local (community) needs. The LEADER place in the local development method is challenging for the next period.

Key words: LEADER, rural development, local, evaluation.

JEL code: R53, R58.

Introduction

Balanced development of the rural areas in Latvia is one of the main challenges in development facilitation of Latvia. One of approaches used in the EU for facilitation of the local development is the LEADER approach (the term CLLD is also used). This approach is being increasingly used also in Latvia, while there is still very little research done on its importance and efficiency. One of the reasons for it - the LEADER results are hard to quantify. Yet, they may still be quantified at least partially, applying various indicators, characterizing investments and also results. The purpose of this paper is to provide an overview on the current role and results of the LEADER/CLLD approach in development of the rural areas in Latvia.

In order to reach the aim, the following tasks were established for the study:

- Provide an insight in the nature and development of the LEADER approach in the EU and Latvia, and in previously carried out evaluation;
- analyse importance of LEADER in the current (2014-2020) planning period and its main results;
- formulate conclusions and recommendations for further use of LEADER.

The hypothesis set for this study is that the LEADER/CLLD approach may be successful for stimulation of the local development and in general has successfully proven itself in the course of the RDP implementation.

Qualitative and quantitative economic research methods: analysis and synthesis; comparative analysis, logically and abstractly constructive methods were used in the study, performing analysis of various scientific publications, laws and regulations, documents, programmes and information sources. Novelty of the paper is linking to quantification of the LEADER results and analysis of results of the most recent (2014-2020) period. Limited format of the article affects more detailed review of the subject. Only some quantitative indicators have been reviewed due to this reason.

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Research results and discussion

1. Nature of the LEADER approach and research carried out on it

LEADER can be defined as purposeful and mutually coordinated activities for facilitation of rural development. The LEADER approach is being used in the EU since 1999. This is a method for facilitation of location-based initiatives having economic, social and administration component. The approach is based on 7 principles: area – based local development strategies, bottom – up elaboration and implementation of strategies, local public – private partnerships – local action groups, integrated and multi-sector actions, innovation, cooperation and networking (EC Regulation 1698/2005). The EU implements this approach by using the Rural Development Programmes (RDP). Several approach implementation stages exist in the EU - LEADER I (1991-1993), LEADER II (1994-1999), LEADER+ (2000-2006), „LEADER axis” (2007-2013), CLLD (2014-2020). Community-Led Local Development (CLLD) is being attributed to other funds and measures; the LEADER method is used in several varieties also in the cities. The LEADER approach is in the context with the development of local communities.

The LEADER approach is currently being considered as a neo-endogenous development tool that includes internal - local and external – a sum of factor and network interaction to assess and use local resources (Bosworth et al., 2015).

Many studies have been carried out on the LEADER role in EU countries, which have been analysed and summarized in many publications (Pollermann et al., 2014a, 2014b, Thuesen et al., 2014 etc.), where the publications up to 2013 can be found. The positive LEADER impact is being linked to a better cooperation, participation, networking, innovations, knowledge, activity of local people; the negative critique is being expressed regarding the top-down approach, proportion of the public sector (especially during the period of 2017-2013), allocation of power in decision-making, increase of bureaucratization, lack of innovations, low local social capital. It is recognized that the LEADER impact may not be generalized, since the circumstances and situations are very different (Pollermann et al., 2014b).

The impact analysis articles are still not very often to be found. The publications are often based on numbers, characterizing the outcome or result indicators, or the assessment is based on the results of surveys, qualitative data, which may be quantified to a very little extent. It is partially determined by the fact that the LEADER approach as such is mostly directed at the indicators that can be measured in terms of quantity, for example, the LEADER value added, assessment of 7 basic principle implementation (Thuesen et al., 2014 etc.). Partially it is determined by the critique on moving of LEADER away from the „bottom-up approach” itself, by replacing implementation of locally-based needs with subordination to top-down measures (Pollermann et al., 2014a). „Down-up” approach is being used, which is a term for the existing transformation of the LEADER approach, increasing the role of the „Top-down” and State-regulated institutions in the implementation process of the LEADER approach. Ignoring of these facts can affect the result, which expresses itself in formal assessment of the project outcome, while it tells very little about the LEADER approach itself and efficiency of its implementation.

The LEADER analysis has so far not been very widespread in Latvia. Studies look at the LEADER implementation in 2007-2013 - economic assessment (Krievina et al., 2015), implementation of the LEADER approach during initial stage (Svanberga, L., 2009; Svanberga, L., Radvila, J., 2007), Analysis of Social Innovations and Partnerships (Paula, L., Zobena, A., 2007).

Several articles emphasizing low use of the local potential may be attributed to a situation currently in Latvia (Dargan et al., 2008, etc.); role and leadership of the local authority is especially significant in successful implementation of the LEADER approach (Marquardt, et al. 2012), based on the neo-endogenous development - creation of cooperation networks (Salemink et al., 2016).

When assessing the role of LEADER, it is important to understand where and what type of jobs are created, whether generation or redistribution of wealth is taking place; long-term management of state-level local processes is of essence, ownership matters, knowledge and understanding regarding the LEADER work, its success and misfortunes are also important topics (Shortall, S., 2004). It means formation of a deeper understanding regarding results achieved by LEADER. Role of the local community in the Development context is not related to growth, increased number of created jobs, but to formation of the community capacity, viability, self-reliance, joint actions (Cavaye, J.).

On the other hand, the LEADER approaches are directed at stimulation of economic processes more than at the investments, including on the administrative level, flexible partnership, strategic vision (Jankovic, 2012). The LEADER's organized LAGs and their importance play a significant role here (Vrabkova et al., 2017).

The role of LAG in the implementation of the LEADER approach has changed during the course of time. Projects become more politically controlled, standardized and administrated, but the independent organizations become 'Quangos' (quasi-non-governmental organizations) (Bruckmeier, 2000), becoming a part of the state project administrating system. Even though the analysis was carried out for the LEADER II period, as shown by other publications, it is still being very topical.

During the next period 2021-2027, the discussions on the LEADER role are handled in the smart villages context.

We can conclude in general that the LEADER role in the Development processes must be assessed broader than just economic or financial gains. The processes themselves and their depth rooted in the understanding of local people regarding the processes, their acceptance and ways of executing thereof is of a great importance.

2. Implementation and development of the LEADER approach in Latvia

The Leader approach in Latvia is being implemented since 2000. Initially it was a Baltic Rural Partnership Programme (2000-2003) funded by the Great Britain government in the Latgale region, where three local action groups (LAG) were created and 20 rural consultants and 40 community coordinators were trained, and the Baltic Sea Region Cooperation Programme supported by the Phare 2002 Small Project Fund in the Zemgale region for handling the local Rural partnership problems in the Baltic Sea region (2004-2005), where five LAGs were created, specialists trained and strategies developed.

Twenty-eight LAGs were involved in the LEADER measures (2004-2006), which encompassed 83 % of the area conforming to the LEADER requirements, and 71 % of population, including by involving 11 LAGs in the national programme „Acquiring of skills” and 17 LAGs in „Integrated rural development pilot strategies”. Initially, only the public organizations with 100 % funding intensity could apply for support (Kudins, 2010).

The LEADER approach as the measure of 4th axis of the Rural Development Programme (RDP 2007-2013) was introduced in Latvia starting 2007, and it encompassed the entire area with 40 LAGs. CLLD approach was implemented also in the Operational Programme „For the Development of Fisheries 2014-2020” as the 4th priority direction in the areas important for 24 Fishery LAGs. The

maximum support for the RDP increased from LVL 5,000 to 20,000 with a different support intensity: up to 60 % for the companies and up to 100 % for the public benefit organizations.

Total funding of RDP 4th axis measures in 2007-2013 was EUR 40 million, which was 2.9 % of the RDP funding (Benga E., 2016). The project applicants representing various NGOs, state authorities and local governments form 75 % and have received 90 % of the granted public funding. These projects based on their nature were directed at improvements to spending of free time and infrastructure.

Nevertheless, in accordance with the results of the population survey carried out by Institute of Agricultural Resources and Economics (AREI) in 2016, knowledge on LEADER still was quite low, and an opinion on economic situation and work opportunities in rural areas has improved very little since 2011. The attitude of the population to changes in the environmental, social infrastructure and service areas has, however, improved, due to the LEADER contributions. The 4th axis measures have in general reached the planned indicators both in increase of employment and in economic growth, but they are quite small for significant improvement of economic situation in rural areas (Benga E., 2016).

In the opinion of involved parties, the implementation of the LEADER approach has made a contribution in development of the area and local communities with improvement of roads, creation of meeting centres, improvement of areas and creation of infrastructure for people to spend their free time. Innovations have not been, however, introduced in majority of situations. Support to production has not been sufficient. Activities in the scope of LEADER are often carried out without a sufficient respect for the general situation and long-term perspectives (Benga E., 2016).

The previous experience of the LEADER implementation in Latvia in general prepared soil for a transfer to implementation of multi-funds, created a LAG network as a LEADER/CLDD implementation tool, covering the entire area.

Multi-fund approach was established by the EU regulations which provided for use of several funds for the implementation of local strategies. (Council EU, 2013). 2014-2020 Two-fund multi-fund approach was introduced in Latvia, which means to combine the relevant European Agricultural Fund for Rural Development (EAFRD) and European Maritime and Fisheries Fund (EMFF) measures which are implemented by the LEADER/CLLD approach.

The EU policy in the new period in general has freed EMFF from limitations and allows using the entire financing of the EU funds for reaching the strategy goals (Research for AGRI..., 2016). Still, as shown by the LDS analysis in both periods (2017-2014 and 2014-2020), LAGs do not use these opportunities and base their strategies on one or two (where applicable) funds, accordingly matching the strategy actions thereto. It poses a question on administrative capacity to satisfy the local needs, especially in the multi-fund circumstances.

3. Quantitative results of LEADER in the period of 2014-2020

The LEADER approach establishes a need to create solutions in the strategy based on the local development. LEADER/CLLD assessment guidelines emphasizing both the role of handling the immediate needs and also of multisectoral cooperation in reaching the local goals (European Commission, 2017). In this context, analysis of the local needs is of a great importance to define goals that may be reached by the activities funded from various sources. Analysis is carried out in the scope of the aforementioned information - to what extent such approach has been implemented

in CLLD strategies, which answers to a question: what was the role of LAG in facilitation of the local development processes, using the LEADER approach.

CLLD strategies in accordance with the LEADER methodology are directed at defining the needs of the local society (community) and satisfaction thereof. Thus, it would be logical that the grounds for the strategies is identification of the territorial needs and defining of development goals, which is formed by understanding and prioritizing real needs of the local society (local community) and making the satisfaction thereof to be a local development goal.

It may be derived from the local needs content analysis of the LDS that the most popular associated symbol (stimulus word) is „local“, which is combined with many other words and creates various associations and meanings (Table 1). In general, it characterizes the actions directed at local level, a location, which is a goal of LEADER. Ranking the terms, to which an adjective „local“ has been most frequently added, „companies“ and „business“ are among the first ones, which may be explained by a special condition of the new LEADER period on moving 50 % of funding to business, while the next most frequently mentioned terms are „tourism, services, NGO, cooperation, activities, products, production“.

Table 1

Analysis of the weaknesses described in the CLLD strategies (frequency of mentioning)

Associated symbol	number	%
labour	123	28
infrastructure	114	26
knowledge, information	94	21
public activities	57	13
services	35	8
other	23	5
Total	446	100

Source: Authors' structure, based on SVVA strategies

An assumption can be made from the aforementioned table that the local needs are most frequently related to increasing of job opportunities, development of infrastructure, as well as availability of knowledge and information. Public activities form a less expressed yet important need. Other needs (availability of services, etc.) appear much less. It cannot, however, be clearly assessed that this is the range of the local needs, as LDS are often adjusted to the terms of the relevant funds – EAFRD and EMFF, also by including mostly the activities supported by these funds.

On the action level of LDS (according to frequency of mentioning) entrepreneurship and public infrastructure are predominant, while public activities, services and training are less frequent. Knowledge is undervalued. This could be explained partly by a structure of the LEADER program, which is created by the EU, and partly by understanding of the LEADER essence by LAGs.

The total public funding for the local LEADER development in the period of 2014-2020 via RDP is planned in the amount of EUR 79 million or 5 % of the total available RDP funds for 2014-2020. Approximately 20 % of that is moved toward the operation and strengthening of the LAGs, development of strategies, cooperation between areas and countries. Majority (EUR 62.8 million), however, is planned for specific projects implemented by using the LEADER approach. At least 50 % of this amount must be used for initiatives intended for strengthening of the local economy (activity 19.21), while the rest - for development initiatives of the location potential (activity 19.22).

Implementation of projects in general is active. More than 1500 projects have been paid for by the beginning of 2019, and almost 500 projects are in the implementation process. Total of 59 % of the public funding available in the period has been reserved in these projects. LEADER projects have a broad territorial cover: they encompass more than 460 territorial units (or almost 80 % of all cities and parishes that conform to the LEADER criteria). In general, from 587 territorial units at all projects may not be implemented in 9 cities and 4 region centres of the Republic, thus a number of eligible territorial units is 574.

Completed projects regarding which at least one report on the recipient's economic activity indicators after the implementation of the project was submitted and available to RSS IS by the moment of data summarizing (20.08.2018) were used for the evaluation of the project results.

The main result indicator planned in the RDP for the LEADER activities is *the employment created*. This indicator is used to evaluate to what extent employment opportunities in the LAG areas were created by the implementation of the local development strategies.

Creation of jobs is provided for only in the activity 19.21 (business-oriented projects). Required number of created jobs is not depending on the volume of the received public funding. The only limitation is to create at least one job position which conforms to the full time employment equivalent (FTE).

Creation of jobs as a goal to be reached in the project has been selected by the smallest portion of support recipients in the relevant activity. From 186 projects, for which the report data is available, creation of jobs is planned in 45 projects. Nevertheless, jobs are actually being created also in other projects. The reported data shows 178 newly created jobs in 92 projects. In addition, the report indicators show even a slightly larger number of jobs than it was planned to achieve in the relevant projects in the third year after the project implementation.

In order to evaluate the target audience of the measure investments in facilitation of economic growth, an increase of the net turnover was also evaluated based on the information included in the project goals. Report data was gathered on 136 support recipients (some of them have several projects), of which an increase of the net turnover for 95 recipients is a target indicator. They point at a significant increase of this indicator after the implementation of projects: from EUR 1.3 million before the project to EUR 4.1 million during the 1st year after the projects. A significant increase of the turnover is being indicated also in the second year after the project, compared to the first year. Such situation to a great extent may be explained also by a comparatively favourable economic situation in the reporting years (2016-2017). At the same time, it allows concluding that the implemented projects in general are economically successful.

Excellent result has been achieved also by calculating the net turnover changes in % from the volume of the made investments. Increase of the net turnover in average for one recipient and the eligible costs of the relevant project have been calculated for this purpose. In average, eligible costs of each recipient's projects are in the amount of EUR 30 thousand, but the achieved increase of the turnover - EUR 48 thousand or 1.6 times higher. Also as a result of analysis of the selected project areas and actions to be taken, one can draw an indicative conclusion that selection of investments in general is well thought over and conforming to the possibilities of the local areas.

Population change is explored as a context data. According to official statistics data, in Latvia population decreased by 3.4 % in 2014-2018, including in the LAGs territories by 5.2 % (CSB). This is substantiated by the LAGs themselves which put a population size in the LDS as an indicator with

decreasing trend in 8 cases from 14 LAGs used in this indicator. Demographic forecasts are even much worse. LEADER in this context should soften the effect.

Nevertheless, in formal results of the implementation process, the core role is played by the LAGs themselves, their feelings, beliefs, attitudes to their work. With the aim to find out an assessment by LAGs of their LDS impact, a survey was carried out in 2018 for the LAGs administrative leaders. The most valued are such impacts as preserving the population in the rural areas, social infrastructure, activities, job creation, especially for small and micro enterprises. Less value is attributed to social services, entrepreneurship, innovations. In the opinion of LAGs, the main importance is attributed to administrative activities – preparing of LDS, operation costs and animation activities. LAGs have a dual role - as an administrator of development and as a local facilitator of development. This was confirmed in interviews with the administration of several LAGs. Trend is to move in more administrative direction.

Conclusions, proposals, recommendations

- 1) Previous experience in Latvia shows better results of LEADER approach in strengthening of local potential (mainly public infrastructure, recreational possibilities etc.) than economic development. Despite that as main result indicator for the LEADER activities is the employment created, job creation is relatively insignificant for promoting employment in target territories.
- 2) In Latvia, the LEADER approach is developing based on the same scenarios analysed in the EU at the beginning of millennium. More detailed research is needed to specify, what are the roles of the EU, national and local level in this context.
- 3) Analyses show that the local development strategies are not intended to define local needs but rather oriented toward the EU financing framework. LAGs are not engaged in acquiring alternative financing, using only the EAFRD, EMFF due to lack of knowledge and motivation. In future, it would be useful to use the multi-fund approach which would facilitate development of strategies according to local (community) needs.
- 4) We can see that formally the LEADER programme works quite effectively and will reach the planned quantitative results. At the same time, it is not clear whether the RDP will reach the rural development aim and the Europe-2020 cohesion and social inclusion aims' qualitative aspects, where we do not have available date.
- 5) The main challenge for the LEADER is to find appropriate place in the local development issues in the next programme period.

Bibliography

1. European Commission (2017). Guidelines. Evaluation of LEADER/CLLD. *The European Evaluation Helpdesk for Rural Development*. August, 2017
2. Benga, E. (2016). *Lauku attīstības programma 2007-2013. Ex-post novērtējums (Ex-post Evaluation of Rural development Programme 2007-2013)*. AREI, p.300. Available at: http://www.arei.lv/sites/arei/files/files/lapas/LAP_202007-2013_20ex-post_20nov_20C4_2093rt_20C4_2093jums.pdf Accessed 12.02.2019.
3. Central Statistical Bureau of Latvia. <https://www.csb.gov.lv/lv> Accessed on 20.12.2018.
4. Research for AGRI Committee - Programmes Implementing the 2015-2020 Rural Development Policy (2016). STUDY IP/B/AGRI/IC/2015-74. PE 573.448 EN
5. Pollermann, K., Raue, P., Schnaut, G. (2014a). Opportunities for a Participative Approach in Rural Development: Findings from LEADER in Mecklenburg-Vorpommern and the Requirements for Community Led Local Development. *Landbauforsch Appl Agric Forestry Res* 3/4 (64)127-138
6. Pollermann, K., Raue, P., Schnaut, G. (2014b). *Multi-Level Governance in Rural Development: Analysing Experiences from LEADER for a Community-Led Local Development (CLLD)*. 54th Congress of the European Regional Science Association: „Regional Development & Globalisation: Best Practices”, 26-29 August 2014, St. Petersburg, Russia. Available at: <https://www.econstor.eu/handle/10419/104063> Accessed 12.02.2019.

7. Krievina, A., Leimane, I., Melece, L. (2015). *Analysis of Economic Aspects of Leader Projects in Latvia*. Proceedings of the 2015 International Conference „Economic Science for Rural Development” No39 Jelgava, LLU ESAF, 23-24 April 2015, pp. 164-175.
8. Kudins, V. (2010) LEADER pieejas istenosana Latvija – līdzsinejas pieredzes izvertejums. Konference „Territorial Development in Latvia and Europe: the Good Practice and Future Possibilities”, 2010.12.10. Latvian Rural Forum Available at: http://www.vraa.gov.lv/uploads/Prezentacijas/V.Kudins_konference_10.12.2010.pdf Accessed 13.02.2019.
9. Svanberga, L. (2009). LEADER+ projektu istenosanas rezultati un iespējas Jelgavas rajona (Results and Possibilities of Implementation of LEADER+ projects in Jelgava District). *Proceedings of the International scientific conference „Economic Science For Rural Development”* //No.19, Jelgava, LLU, pp.213-219.
10. Svanberga, L., Radvila, J. (2007). Lauku partnerības Zemgales reģiona (Rural Partnerships in Zemgale Region). *Proceedings of the International Scientific Conference „Economic Science for Rural Development”* // Academy of Agricultural and Forestry Sciences of Latvia. Latvia University of Agriculture. - Jelgava, No.12, pp.113- 121.
11. Paula, L., Zobena, A. (2007). Partnerība – inovatīvs diskurss Latvijas lauku attīstībā. (Partnership – an Innovative Discourse in the Rural Development of Latvia) *Latvijas Universitātes raksti (Scientific Papers University of Latvia)*. – Rīga, Vol.714, Sociology, pp.72-85.
12. Dargan, L., Shucksmith, M. (2008). *LEADER and Innovation*. European Society for Rural Sociology. Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK. Sociologia Ruralis, Vol 48, Number 3, July 2008 DOI: 10.1111/j.1467-9523.2008.00463.x
13. Marquardt, D., Möllers, J., Buchenrieder, G. (2012). *Social Networks and Rural Development: LEADER in Romania*. European Society for Rural Sociology. Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK Sociologia Ruralis, Vol 52, Number 4, October 2012 DOI: 10.1111/j.1467-9523.2012.00571.x LAGs
14. Salemink, K., Strijker, D., Bosworth, G. (2016). *The Community Reclaims Control? Learning Experiences from Rural Broadband Initiatives in the Netherlands*. European Society for Rural Sociology. Sociologia Ruralis, Vol 57, Number S1, November 2017 DOI: 10.1111/soru.12150
15. Shortall, S. (2004). *Social or Economic Goals, Civic Inclusion or Exclusion ? An Analysis of Rural Development Theory and Practice*. Sociologia Ruralis, Vol 44, No. 1, January 2004, European Society for Rural Sociology, pp.109-123.
16. Thuesen, A.A, Nielsen, N. Ch. (2014) A Territorial Perspective on EU’s LEADER Approach in Denmark: the Added Value of Community-Led Local Development of Rural and Coastal Areas in a Multi-Level Governance Settings. *European Countryside* No.4, 2014, pp. 307-326.
17. Council EU (2013) 'COUNCIL REGULATION (EC) No 1305/2013 of 17 December 2013 on Support for Rural Development by the European Agricultural Fund for Rural Development (EAFRD) and Repealing Council Regulation (EC) No 1698/2005'. *Official Journal of the European Union* L347/487.
18. Cavaye, J. *Understanding Community Development*. Cavaye Community Development Available at: <http://www.wpri.info/wp-content/uploads/2010/07/Understanding-Community-Development.pdf> Accessed 05.12.2018.
19. Jankovic, D. (2012) Territorial Approach to Regional Rural Development. *Economics of Agriculture* 4/2012 UDC: 332.122:338.43
20. Vrabkova, I., Saradin, P. (2017) The Technical Efficiency Of Local Action Groups: A Czech Republic Case Study. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis*, Volume 65 issue 3, pp. 1065-1074.
21. Bosworth, G., I. Annibal, T. Carrollet al. (2015). Empowering Local Action through Neo-Endogenous Development: the Case of LEADER in England. *Sociologia Ruralis* 56 (3), pp. 427–449.
22. Council Regulation (EC) No. 1698/2005 of 20 September 2005 on Support for Rural Development by the European Agricultural Fund for Rural Development (EAFRD). *Official Journal of the European Union*, L 277/2, 21.10.2005.

JUSTIFICATION OF THE ABOLISHMENT OF LOCAL GOVERNMENTS REAL ESTATE RIGHT OF FIRST REFUSAL IN LATVIA

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Abstract. Procedure of offering and exercising right of first refusal on immovable property differs in countries across the globe. Right of first refusal bestowed on local governments by the law is the most controversial one with extreme opinions on both sides — some believe that local governments need extensive opportunities to exercise right of first refusal, while others, quite to the opposite, think that the local governments should not hold such rights at all. If the local governments have free hands to exercise the right of first refusal on real estate, it should be considered as an administrative hindrance impeding transactions with real estate. It is evidenced, for instance, by Doing Business' criterion Registering Property, according to which it takes five days to receive a rejection of right of first refusal in order to register the property rights in Latvia. There is an opinion that local governments exercise their right of first refusal in rare cases. To examine that hypothesis, data were obtained from local governments in Latvia regarding the number of cases when the right of first refusal was exercised between 2015 and 2017. The final part of the study offers a solution to the adverse consequences caused by efforts to bypass statutory right of first refusal given to local governments.

Key words: right of first refusal, right of pre-emption, real estate transactions.

JEL code: R3, K11, K25.

Introduction

Right of first refusal is a right established by law, contract or will to first the refusal rights holder to acquire a property on the conditions agreed upon in a completed transaction between seller and buyer (Zevenbergen et al., 2007) or to be entitled to 'step into the shoes of the third party' upon the conclusion of a contract (Naude, 2004). An advantage to acquire a property after another has turned down this right is widely used in a number of different contexts (Naude, 2006). Usually similar terms are used to designate such right – 1) 'right of first refusal', defined by Black's Law Dictionary as „a potential buyer's contractual right to meet the terms of a third party's offer if the seller intends to accept that offer" and 2) 'pre-emptive right' or 'right of pre-emption' – „a potential buyer's contractual right to have the first opportunity to buy, at a specified price, if the seller chooses to sell". Therefore, some English writers limit the term 'right of pre-emption' to preferential rights to purchase at a fixed price (Naude, 2006). However, the scientific literature does not follow a certain pattern of terminology consistently. Commonly, both terms are used to indicate one's right to acquire a property under the same conditions.

In Europe the picture of the right of first refusal law and procedures in this regard is very diverse (Schmidt et al., 2005). Several scientists have tried to systematise and compare first refusal rights in different countries (Schmidt et al., 2005; Zevenbergen et al., 2007). Every country has its specific types and subjects of the right of first refusal as well as procedure of offering and use thereof. In some countries right of first refusal does not exist (Italy and Netherlands) or it is limited (Spain, Sweden and Scotland) (Schmidt et al., 2005), and there are also countries, Latvia among them, with a wide range of persons entitled to the right of first refusal and a complicated procedure of the offering and exercising of this right.

One of most frequently named examples of local governments exercising limited right of first refusal is, for example, in Slovenia – within the defined area in Slovenia the local government can, according to the law, establish the right of first refusal on the desired areas which may be comprised of one or more plots or even a whole territory of the local government (Zevenbergen et al., 2007). In some cases, not only does a buyer hold the right of first refusal, but, for example, in France, the

Land development and rural establishment society (*Societes d'Amenagement Foncier et d'Etablissement Rural*) is entitled to replace the receiver of donation in case of certain types of donation receivers. Usually the right of first refusal is defined as an integral part of land management and is contractual or legal — for local government, state, tenants and lessees, joint owners, neighbours etc.

When it comes to the right of first refusal, several important questions arise, for example — which types of transactions are covered by a right of first refusal agreement? What is the effect of a sale of the right of first refusal property as part of a larger package of properties? (Naude, 2006). Nevertheless, the goal of this research is to find out if local governments in Latvia really need to have the right of first refusal. Therefore, in the beginning it was analysed the regulatory framework of all first refusal rights in Latvia. Secondly it was determined the frequency of the use of the right of first refusal by local governments by sending surveys to all local governments in Latvia and summing up the results. Then it was concluded that, apart from a small number of cases when the right of first refusal was actually used by local governments, bypassing the right of first refusal is a very common practice in Latvia. Finally, at the end several proposals are put forth to potentially solve the adverse consequences of the local government real estate right of first refusal.

Types of right of first refusal of real estate in Latvia

Latvia has a complicated, multi-level procedure for exercising the right of first refusal based on: 1) a law; 2) an agreement (mandatory corroboration of agreed right of first refusal in the Land Register); 3) a court judgement; 4) a will. In 2018, the right of first refusal in Latvia was stipulated in 18 laws (this number tends to increase) and the procedure for the implementation of this right is laid down in five regulations of the Cabinet of Ministers of LR. The right of first refusal in Latvia must be offered to:

- 1) joint owners (cannot exercise right of first refusal only where the undivided share is sold to another joint owner);
- 2) in some cases, to heirs of real property;
- 3) in case of partial ownership to land and structures to owners of the structure or land;
- 4) local governments:
 - if real estate in the local government administrative territory is being alienated and such is necessary to perform the local government functions prescribed by law, by taking into account the use of the territory permitted (planned) in the territorial planning, laws and regulations, development planning documents and other documents that substantiate the necessity of the relevant real estate for the implementation of the local government functions (Law „On Local Governments”);
 - in port territories — to local government port administration;
 - in territories of national civil aviation airfields;
- 5) the State:
 - in especially protected natural zones;
 - when alienating a national cultural monument;
 - if the real estate being sold is located in the territory of a national civil aviation airfield;
 - if private person owns land at public waters and want to sell it.
- 6) the Latvian Land Fund, if agricultural land is being sold.

- 7) apartment owners when selling the apartment property, if the community of apartment owners has decided thereon and an entry has been made in the Land Register regarding the existence of the right of first refusal.
- 8) special economic zone administrations if a transaction with real estate takes place in its territory.
- 9) power utility companies regarding objects used for supplying power, including buildings, structures, systems, devices, equipment, networks, pipelines or other objects that are not a property of the power supply company, yet it is included in the balance sheet of the merchant or is situated in the area of operation of licence of the power supply merchant in question.

Right of first refusal of local governments as an obstacle hindering real estate transactions

Of all the types of right of first refusal, those given to local governments is the most controversial, as it significantly hinders real estate transactions and constitutes an excessively burdening formality in real estate transactions (Svemberga, 2012). Latvian local governments have right of first refusal on transactions of real estate, except where 1) real estate is acquired by the State; 2) real estate is acquired by foreign states for the needs of their diplomatic or consular institutions; 3) property to be privatised by the State and local governments; 4) production facilities with all their equipment; 5) real estate that is transferred from one person to another without remuneration or by way of exchange; 6) real estate from which a part has been alienated and which property remains under joint ownership of the seller and purchaser; 7) real estate that is being sold by voluntary or mandatory auction; 8) real estate in relation to which third persons have the right of first refusal based on law, contract, or will; 9) residential property, including a flat, the ownership of which has been acquired up to the privatisation of the residential building (On Local Governments, 1994). In all other cases of acquiring real estate the local governments must be offered right of first refusal. It has become a formal procedure and the prescribed term, most often, is merely a factor burdening the transaction, because in most cases one can see from actual circumstances that the property subject to transaction will not qualify for functions of local government (Svemberga, 2012).

Several authors have sought ways to restrict or reduce these mostly formal „supervisory“ entitlements of local governments (Goehner, 2006; Svemberga, 2012): 1) registering a note about possible right of first refusal by local governments for those properties that are required by the local government to implement its functions (in the Netherlands - designate an area within which a landowner who wants to sell his property is obliged to offer it first to the local government (Buitelaar, 2010; Ploeger et al., 2005)); 2) declining the right of first refusal of local governments. Declining the right of first refusal of local governments as the main conclusion in his doctoral thesis „Right of First Refusal of Local governments“ is put forth by, for example, an expert of German administrative law Torsten Goehner.

Local governments rarely exercise their right of first refusal, for example, in Germany (Goehner, 2006). In 1999, 3,200 cases out of 44,600 purchase transactions had right of first refusal in 116 local governments of Germany where they were exercised 47 times, hence in ~0.11 % of all acquisition transactions of real estate in these local governments.

Table 1

Number of cases when Latvian local governments have exercised the right of first refusal on real estate between 1 January 2015 and 31 December 2017

No	Local government	Type of notification	2015	2016	2017	Total (each local governments)
1	Rezekne city	e-doc	6	2	8	16
2	Jelgava city	e-mail	0	3	3	6
3	Kekava county	e-doc	1	4	1	6
4	Marupe county	e-doc	2	2	1	5
5	Valka county	e-doc	1	2	1	4
6	Aluksne county	e-mail	0	1	2	3
7	Cesis county	e-mail	0	2	1	3
8	Daugavpils city	e-mail	0	2	1	3
9	Jekabpils city	e-mail	0	2	1	3
10	Riga city	e-doc	1	1	1	3
11	Grobina county	e-mail	2	0	0	2
12	Jurmala city	e-mail	1	1	0	2
13	Kraslava county	e-doc	0	2	0	2
14	Babite county	e-mail	0	0	1	1
15	Balvi county	e-mail	0	1	0	1
16	Burtnieki county	e-mail	0	1	0	1
17	Dobele county	e-doc	1	0	0	1
18	Durbe county	e-doc	0	0	1	1
19	Gulbene county	e-mail	0	0	1	1
20	Jelgava county	e-doc	1	0	0	1
21	Koceni county	e-doc	1	0	0	1
22	Krimulda county	e-doc	1	0	0	1
23	Liepaja city	e-doc	0	0	1	1
24	Limbazi county	e-mail	1	0	0	1
25	Ogre county	e-doc	1	0	0	1
26	Ozolnieki county	e-mail	1	0	0	1
27	Rezekne county	e-doc	0	0	1	1
28	Ropazi county	e-doc	0	0	1	1
29	Saldus county	e-mail	0	1	0	1
30	Stopiņi county	e-doc	0	0	1	1
31	Valmiera city	e-mail	1	0	0	1
32	Viesīte county	e-mail	1	0	0	1
Total			23	27	27	

Source: author's calculations based on data received from local governments

Conception of the Cabinet of Ministers of the Republic of Latvia „On Simplification of Procedures of Corroboration of Real Estate Rights” in 2009 states that the local government exercises the right of first refusal „extremely seldom”. In order to find out the extent to which the local governments exercise the right of first refusal in Latvia, in February 2018, a survey requesting an answer to the question: „how many times has your local government exercised the right of first refusal in years 2015, 2016 and 2017” were sent to all 119 local governments in Latvia (9 cities and

110 counties of the Republic). One hundred two local governments replied to the letter sent in February 2018, but two of them (Salaspils and Sigulda countries) did not provide an answer as to the merits, they were inaccurate and were found not to qualify for the research. Surveys were sent to the remaining 17 local governments in April 2018. After repeatedly sending the survey, answers were received from 112 local governments totally representing 96.4 % of the territory of Latvia. (The Baldone, Baltinava, Dagda, Jaunpiebalga and Varaklani local governments did not reply, however they constitute a very small portion of the territory of Latvia),

It can be concluded from the answers received from the local governments that the right of first refusal was used by local governments less than 30 times per year (in ~0.5 % of cases of all real estate transaction purchases) between 2015 and 2017. Only 32 local governments (Table 1) have exercised their right of first refusal on real estate purchases at least one time during said period. Many local governments, when answering the question, also explained that they have never exercised the right of first refusal.

The following conclusions can be drawn regarding the right of first refusal of local governments:

- 1) local governments exercise right of first refusal on real estate purchase transactions in very rare cases;
- 2) in the survey comments, local governments emphasized that they lack funds to use the right of first refusal, even if a particular real estate would be required for implementing the functions of local governments. A similar conclusion was drawn also in Germany (Gohner, 2006);
- 3) some of these transactions are 'negotiated', namely the local government and most often a land owner makes an agreement that if the property is sold at certain purchase price, it is agreed in advance that the local government would use the right of first refusal. Such transactions exist even though it is impossible or very difficult to identify them if the parties do not admit it;
- 4) employees of the local governments believe that right of first refusal are introduced to implement municipal functions, they are laid down in the law and hence they are legally grounded and necessary. One can see that the employees of local governments find it self-evident and important to 'supervise', control transactions, and to know what real estate transactions are made in the territory of local government;
- 5) employees of several local governments were of the opinion that right of first refusal of local governments does not impede real estate transactions. For example -

Opinion of the representative of Priekuli county: „We cannot agree with the opinion that the right of first refusal impedes transactions“;

Opinion of the representative of Engure county: „I cannot agree with You, that local governments could be an impeding factor. Local governments can exercise the right of first refusal only if this property is required for implementation of functions of the local governments and complies with the planning documents“;

Opinion of the representative of Garkalne county: „Right of first refusal does not allow local governments to acquire the property without any restrictions only because it has an advantageous location or a low price. Following from this consideration, we would like to point out that we find the opinion about impeding impact of the right of first refusal of local governments on real estate transactions to be biased“;

Opinion of the representative of Dobeles county: „We cannot agree with the thesis presented in the survey that the use of right of first refusal of local governments qualifies as one of potential impeding conditions of real estate acquisition transactions in Latvia. The following is the rationale

behind our objections: 1) after restoration of land ownership rights the former owners were not always willing to receive land in other location as compensation for former land property. Hence, there are real cases where municipal buildings (1 school, 2 preschool establishments in Dobeles) are situated on a land owned by private persons. If said land plots were sold, the local government would certainly want to exercise the right of first refusal to end the situation of joint ownership; 2) Applications on use of right of first refusal are examined by the local government in 5 work days maximum therefore it cannot be considered as an essential impediment; 3) Commercial objects are never subject to the right of first refusal of local governments".

Dr. iur. A. Svemberga found the right of first refusal of local governments as an excessively encumbering formality in transactions with real estate and this was acknowledged also by the Cabinet of Ministers of the Republic of Latvia, stating that „procedure of right of first refusal of the State and local governments, given its mandatory nature, involves essential complications and prolonged periods for corroboration of real estate ownership rights in general; the right of first refusal process (in the preparation stage) rather considerably prolongs the registration process both in terms of the steps and time required and time-consumption"). Therefore, to believe that the right of first refusal of local governments does not impede transactions is to neglect the fact that they hinder transactions. It must be acknowledged that the delay is relatively short (pursuant to Regulations No 919 of the Cabinet of Ministers of 28 September 2010 „Regulations on Procedure and Terms of Use of Right of First Refusal by Local Governments" — 20 days; In calculations of Doing Business' principle Registering Property the right of first refusal assigned to the local governments in Latvia is valid for five days; in practice the period to decline is usually estimated between 15 minutes and five days), but considering the large number of rejections, this delay is disproportionate and unnecessary, because the State has established a mechanism for functions of local governments regarding alienation of real estate required for their functions — these are rights to address the Cabinet of Minister with a proposal to alienate real estate as stipulated in the law in favour of certain local government, if this property is necessary for public use (public needs), i.e. construction of roads, streets, squares, pedestrian walks, scaffold bridges, flyovers, as well as port berth. It means that the local governments have an instrument for alienating the real estate to ensure functions of local governments — to alienate the property for public needs (compulsory acquisition), and they do not need to 'control' or 'supervise' all real estate purchase transactions (except those stipulated in the Law On Local Governments).

The main shortcoming of such 'supervision' or right of first refusal as 'means of threat' (German *Drohmittel* (Gohner, 2006)) used by a local government is a wish of the parties to 'bypass' right of first refusal given to the local governments. Existence of such transactions has been admitted in market price reports also in Latvia between 2006 and 2007, although today the situation is virtually the same: „[...] such practice has been created, because the parties involved in a purchase transaction want to bypass the statutory right of first refusal given to the local government, by selling the property in undivided shares. In approximately half of the cases the property is sold in undivided shares (usually in two transactions). The most common proportions are 1/2 and 1/2, 1/10 and 9/10, 1/100 and 99/100, 1/3 and 2/3" (Real estate market report 2012 Q4. Agriculture and forest land market). Between January 2006 and April 2007, purchase contracts were repeated within five days, and it means that the right of first refusal given to the local governments or the State to one and the same property in 25.9 % of cases among all purchase agreements in total (Conception project „On Simplification of Corroboration of Real Estate Rights") was bypassed, which evidences an extremely

intense bypassing of the right of first refusal, in addition to bypassing the right of first refusal when concluding a fictitious barter contract or donation contract. If the parties avoid the right of first refusal, eventually it leads to the following adverse consequences (shortcomings) in the land management system in the State in general:

- 1) inaccurate records of transactions;
- 2) false purchase price specified in purchase contracts;
- 3) waste of unreasonably large amount of administrative resources of local governments (Goehner, 2006);
- 4) distrust in civil rights, wish to 'bypass' them, hide actual data of transactions;
- 5) encouragement to parties to enter in risky transactions without being aware of their negative implications, resulting in a situation where one of contractual parties (usually households) find themselves in a less competent position, leading to considerable loss in future. For example, Section 1415 of the Civil Law of the Republic of Latvia states „an impermissible or indecent action, the purpose of which is contrary to religion, laws or moral principles, or which is intended to circumvent the law, may not be the subject-matter of a lawful transaction; such a transaction is void”. So, if a transaction is intended to 'bypass the law' (right of first refusal of local governments), it may be declared void.

These shortcomings in land management in general constitute more extensive loss in comparison to the right of first refusal of local governments used slightly less than 30 times within one year.

Recently in Latvia one can see efforts to improve the process of use of right of first refusal of local governments. Decree No. 125 of the Cabinet of Ministers of LR of 15 May 2017 „On Plan to Improve Entrepreneurship Environment” it was intended: „...to ensure electronic data exchange among local governments and Land Register in area of using the right of first refusal by cancelling the mandatory requirement for residents to receive a reference issued by the local government and to submit it in the Land Register”. Such amendments would lead only to considerable change in terms of time of implementing the transaction and overcoming administrative hindrances related to that real estate, however it would not abolish the right of first refusal of local governments as such, but would merely facilitate information exchange procedure.

Conclusions, proposals, recommendations

Basing on the data obtained and arguments analysed, the authors recommend:

- 1) to abolish the right of first refusal of local governments in the case of selling real estate or
- 2) to entitle local governments to right of first refusal only in certain areas included in the development plans of the local governments, if a simple, publicly available (to transaction parties, local governments, notaries, Land Registers) and easy to implement way is found to identify such areas without registering relevant remark in the Land Register that would constitute a restriction of those property rights.

Bibliography

1. Black's Law Dictionary (1999). Garner B.A. Editor in Chief. Seventh Edition. St.Paul: West Group. p. 1325.
2. Buitelaar, E. (2010). Cracks in the Myth: Challenges to Land Policy in the Netherlands. *Tijdschrift voor Economische en Sociale Geografie*, Vol. 101, No. 3, pp. 349–356. <http://doi.org/10.1111/j.1467-9663.2010.00604.x>
3. Goehner, T. (2006). Das gemeindliche Vorkaufsrecht. Schriftenreihe Studien zum Verwaltungsrecht. Hamburg: Verlag Dr. Kovac. p. 245.
4. Legislation of the Republic of Latvia (1937). The Civil Law. Retrieved: <https://likumi.lv/ta/en/en/id/225418>

5. Legislation of the Republic of Latvia (1994). On Local Governments. Retrieved: <https://likumi.lv/ta/en/en/id/57255>
6. Naude, T. (2004). Rights of First Refusal or Preferential Rights to Contract: A Historical Perspective on a Controversial Legal Figure. *Stellenbosch Law Review*, 2004 (66). Retrieved: <https://www.researchgate.net/publication/266358177>
7. Naude, T. (2006). Which Transactions Trigger a Right of First Refusal or Preferential Right to Contract? *South African Law Journal*, 123(3). pp. 461-496. Retrieved: https://journals.co.za/content/journal/ju_salj
8. Ploeger, H., van Velten, A., Zevenbergen, J. (2005). Real Property Law and Procedure in the European Union. Report for the Netherlands. Retrieved: <https://www.eui.eu/Documents/DepartmentsCentres/Law/ResearchTeaching/ResearchThemes/EuropeanPrivateLaw/RealPropertyProject/TheNetherlands.PDF>
9. Registering Property. Doing Business (2018). Latvia. Retrieved: http://www.doingbusiness.org/en/data/exploreeconomies/latvia#DB_rp
10. 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) Wuerzburg. Retrieved: <http://www.eui.eu/Documents/DepartmentsCentres/Law/ResearchTeaching/ResearchThemes/EuropeanPrivateLaw/RealPropertyProject/GeneralReport.pdf>
11. Svemberga, A. (2012). Registration Systems of Real Property in Europe. Doctoral thesis. University of Latvia. Retrieved: <https://dspace.lu.lv/dspace/handle/7/5124>
12. Zevenbergen, J., Ferlan, M., Mattsson, H. (2007). Pre-emption rights compared Netherlands, Slovenia and Sweden. In: *Real property transactions. Procedures, transaction costs and models*. Erik Stubkjer (eds.). Amsterdam: IOS Press. pp. 261-278.

SUPPORTING GENERATION AND DISTRIBUTION OF ENERGY ORIGINATING FROM RENEWABLE SOURCES IN KUJAWSKO-POMORSKIE PROVINCE

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Abstract. Supporting generation and distribution of energy from renewable sources enables energy efficiency and security to increase. Kujawsko-pomorskie Province is at the forefront amongst other provinces in Poland and readily implements the assumptions of the energy policy based on renewable energy sources. As part of the Regional Operational Program of Kujawsko-pomorskie Province, the Marshal's Office in Torun conducted activities supporting the production and distribution of energy coming from renewable sources in 2018, addressed at the inhabitants of the province. Boroughs were the applicants obliged to obtain information from residents about the demand for renewable energy. One of the beneficiaries was an urban-rural borough, located in the county of Bydgoszcz. Therefore, research was carried out whose aim was to analyse the applications submitted, taking into account the type of installation, its capacity and the place of residence of the beneficiaries of Action 3.1 „Supporting generation and distribution of energy from renewable sources” in the borough of Koronowo. The research showed that the borough did not use the available pool of funds for the action. 51 applications were submitted, in which requests for photovoltaic, solar and air heat pumps were formulated. Investment opportunities for the generation and distribution of energy from renewable sources were more eagerly used by rural residents than those of the cities. The largest interest was shown for photovoltaic installations, whose average requested power was 1 kW higher than for the installations declared in the city and amounted to 7.41 kW.

Key words: renewable energy sources, Kujawsko-pomorskie province, Koronowo borough, support for renewable energy installations.

JEL code: D25, O13, Q42.

Introduction

According to European regulations, the share of energy from renewable sources in Poland's energy balance by 2020 is expected to be at least 15 %. It is therefore justified to support measures for the generation and distribution of energy from renewable sources (Szczerbowski R., Ceran B., 2013; Wielewska I., Plonka A., Kupczyk A., 2018; Mickiewicz B., Zuzek D., 2012). This idea fully implements the assumptions of sustainable development of urban and rural areas, which requires support from the country's policy. In terms of geographical and environmental conditions, Poland is a good place for the production of renewable energy. Modern technologies lead to the obtainment of better and better results of energy production, without disturbing the ecosystem (Snarski S.J., 2015). The current way of using energy does not correspond to the rules of managing sustainable development. In a balanced transformation of the energy sector, a priority role should be played by of the environmental burden due to generation and supply of various forms of energy to the recipients as well as the reduction of primal fossil energy media, the reduction of the extent of dependence of producing various forms of energy on these resources while maintaining the current level of energy services (Wielewska I., 2016).

It should be noted that ecological investments contribute to restraining the progressing degradation of the environment and activities recognized as ecologically harmful (Wielewska I., 2015), therefore it is not possible to talk about sustainable development in the field of energy without taking into account renewable energy sources (RES).

Local government units of all levels are increasingly willing to take action to create renewable energy sources (RES). They may be investors in such tasks or beneficiaries thereof. Measurable benefits from the introduction of energy from RES are particularly important in terms of

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environmental protection and ensuring energy security. Boroughs are perfect places for the development of this type of investment, which is why aid programs are increasingly often dedicated to these entities. The allocation of public aid funds appropriated for renewable energy for boroughs becomes an opportunity for them to attract investors' interest, and – in effect – for economic development, greater competitiveness and promotion of the borough in Poland and in the world (Sasinowski M., 2017).

In recent years, there has been an increase in the interest in alternative energy sources. This is directly related to the growing problem of smog in the country, the possibility of depletion of lignite and hard coal deposits and ever higher prices of electricity. However, the RES potential in Poland is still poorly used, which is closely related to the economic calculation. Therefore, it is crucial to support renewable energy, which is a priority for energy policy for the coming decades. Co-financing of investments related to the production of renewable energy is the basic driver of development and willingness to make changes. It results primarily from the level of own contribution in the investment acceptable by natural persons, with partial coverage of the total costs from the state budget and the European Union (Sobczyk W., Baran T., 2016).

The primary renewable energy source is solar energy, whose annual energy potential is 15 thousand times larger than the energy resources coming from fossil fuels and nuclear energy combined. Wind energy, water, geothermal energy as well as energy from biogas and biomass should also be included in renewable sources. Kujawsko-pomorskie Province, alongside Pomeranian and Silesian Provinces, is the leader of the country in terms of the use of renewable energy sources (Krupnik K., Brozek M., 2008).

The recruitment bodies for activities supporting the development of renewable energy are the Marshals' Offices. Boroughs, as the basic units of the local government which have an influence on the energy policy, may apply for co-financing for this purpose. One of the boroughs which collected data from the interested property owners about the demand for renewable energy sources and applied for co-financing for this purpose, as part of the recruitment for Action 3.1 „Supporting generation and distribution of energy from renewable sources”, was the borough of Koronowo.

In connection with the above, a review was carried out of activities in the area of raising funds for the generation and distribution of energy from renewable sources of the borough of Koronowo, an urban-rural commune located in Kujawsko-pomorskie Province.

The aim of the study was to analyse the submitted applications, taking into account the type of installation, its power, costs and place of residence of the beneficiaries of Action 3.1 „Supporting generation and distribution of energy from renewable sources” that are owners of residential buildings in the Koronowo commune. The study also presents the estimated costs of assembling the solar installation most frequently chosen in the photovoltaic installation program, as well as the calculation based on the average energy consumption before the project implementation, regarding the length of use, followed by the return of costs incurred for the investment.

Material and methods

The intake of applications under Action 3.1 „Supporting generation and distribution of energy from renewable sources, scheme: microinstallations, scheme 1: residential and public buildings (excluding healthcare infrastructure)” was run from 20 August to 14 December 2018 by the Marshal's Office in Torun (competition no. RPKP.03.01.00- IZ.00-04-212/18). Funds for the implementation of the program came from the Regional Operational Program of Kujawsko-pomorskie Province. Eligible

applicants were local government units, cooperatives and housing communities, social housing associations and non-governmental organizations. The maximum co-financing per unit was PLN 1 million (www.mojregion.eu).

The research was conducted on the basis of data from the application submitted by the borough of Koronowo, located in the county of Bydgoszcz, in Kujawsko-pomorskie Province. It is an urban-rural commune occupying an area of 412 km², in which there are 23655 residents, of whom 10740 reside within the city limits. In the borough, the majority of residents are registered in rural areas (54.6 %), inhabiting 33 villages. According to the data of the Koronowo Town and Borough Office, as of 31 December 2018, the most people in rural areas lived in Makowarsko (1326 inhabitants), Tryszczyn (1069 people) and Wtelno (1020 registered). The smallest communities in terms of population are Skarbiewo, Osiek and Popielewo, in which there are fewer than 100 residents (www.bip.koronowo.pl, www.bydgoszcz.stat.gov.pl). The population in Koronowo and the villages is presented in Table 2.

The information on the application submitted by the borough for co-financing activities supporting generation and distribution of renewable energy was obtained from the Koronowo Town and Borough Office, which prepared the competition documentation based on data collected from the interested property owners, including the technical design of the proposed installations. The subsidy was intended for natural persons living in the borough and did not include business or agricultural activities. Any equipment for generating energy from renewable sources can only be used for household purposes. The installations can be mounted on existing or constructed buildings, subject to technical acceptance by the end of April 2019. Promotional activities aimed at dissemination of Action 3.1. were conducted through the organization of regular meetings with the residents of Koronowo and the surrounding area. In total, 4 meetings were organized, with the participation of communal officials and technical specialists in the field of assembling installations for the production of energy from renewable sources. The meetings took place in Koronowo, Tryszczyn, Makowarsko and Wierzchucin Krolewski.

As part of the activities supporting the generation and distribution of energy from renewable sources, property owners were able to apply for partial co-financing of the incurred net eligible costs at the level of up to 50 %. The calculation of the co-financing level was made on the basis of the mathematical product of the net costs incurred and the maximum level of return. Despite the intended use of energy for the sole needs of households, the installations could be designed on other buildings owned by the applicant. When choosing a mounting location, especially for photovoltaic and solar installations, the key was the selection of a place with the best possible insolation. The choice of the place was related to the VAT tax difference, which amounted to 8 % for the installations on or in a residential building, while it was 23 % for the assembly on or in an outbuilding or on the surface of the land. Having taken into account the VAT rates, the total co-financing amount was about 46 % when assembled within a residential building and about 42 % for installations on the ground or an outbuilding. The rated capacity of the installation was determined on the basis of average values of electricity bills, and the maximum investment cost for a natural person could not exceed 100,000. zł. The beneficiaries could apply for the installation of solar installations, air pumps for the purposes of heating utility water, photovoltaic installations and pellet boilers.

In order to analyse the length of the investment return period related to the mounting of photovoltaic installations, the data regarding net costs of installations indicated by the Koronowo Town and Borough Office were used. The owners of residential buildings, who were reporting the

need for a solar installation, were obliged to submit a technical design in which the planned installation capacity was taken into account, through an enterprise involved in the assembly of such devices. Its size was determined based on the average annual energy consumption. The beneficiaries of the program were able to submit projects with power levels in the 1.74-9.86 kW range. The installations with the smallest power (1.74 kW) were selected by those households whose annual sum of costs related to paying electric bills amounts to about PLN 900. The installation with the largest capacity available in the program (9.86 kW) was addressed at residents who spend about PLN 5,400 per year for this purpose. An example of a list including the costs incurred for electricity before the RES investments were made and the related demand for installation capacity and costs are presented in Table 1.

Table 1

Costs of the making of photovoltaic installations depending on their power

No	Cost of electricity (PLN/month)	Power of photovoltaic installation (kW)	Net cost of installation net (PLN)	Gross cost (VAT 8 %)	Gross cost (VAT 23 %)
1.	75	1.74	6202.78	6699.00	7629.42
2.	100	2.32	8270.37	8932.00	10172.56
3.	125	2.61	9304.17	10048.50	11444.13
4.	150	3.19	11371.76	12281.50	13987.26
5.	175	3.77	13439.35	14514.50	16530.40
6.	200	4.35	15506.94	16747.50	19073.54
7.	225	4.93	17574.54	18980.50	21616.68
8.	250	5.51	19642.13	21213.50	24159.82
9.	275	6.09	21709.72	23446.50	26702.96
10.	300	6.67	23777.31	25679.49	29246.09
11.	325	6.96	24811.11	26796.00	30517.67
12.	350	7.54	26878.7	29029.00	33060.80
13.	375	8.12	28946.3	31262.00	35603.95
14.	400	8.7	31013.89	33495.00	38147.08
15.	425	9.28	33081.48	35728.00	40690.22
16.	450	9.86	35149.07	37961.00	43233.36

Source: author's own study based on the data from The Koronowo Town and Borough Office

In the research, a comparative analysis was made of the time needed to repay the investment carried out in-house, without the use of financial assistance and after receiving co-financing with two possibilities of the assembly location and the associated VAT rate: within a residential building (8 %) as well as within an outbuilding or on the ground (23 %). In order to calculate the length of the investment repayment period, which could be made without public funding, the calculated gross costs were divided by the amount of monthly electricity bills. The investment return time, which was carried out under Action 3.1, was calculated on the basis of the quotient of own contribution and the sum of electricity bills for one month. For this purpose, the co-financing amount was calculated first (net cost x 50 %), and then it was subtracted from gross amounts accounting for 8 % and 23 % VAT. Analogically to the previous analysis, the obtained costs are divided by the value of monthly bills for electricity.

Research results and discussion

The total eligible cost of the project in the commune amounted to PLN 1,033,940.00 net, using the available pool of funds in approximately 50 %. The residents of the borough of Koronowo submitted 51 applications for installations with a total capacity of 315.44 kW. A demand was submitted for 1 solar installation with a capacity of 11.6 kW and 7 air heat pumps with a total capacity of 17.5 kW. There was No interest in assembling pellet boilers. The detailed data on the number and scope of applications, taking into account the place of residence of the beneficiaries, are presented in Table 2.

Table 2

The number of applications for Action 3.1 submitted in the borough of Koronowo by the place of residence of the beneficiaries

No	Place of residence of beneficiaries	Number of		Total power of installation [kW]	Requested number of		
		residents	applications		heat pumps	photovoltaic installations	solar installations
1.	Buszkowo	401	3	13.92	0	3	0
2.	Gogolin	236	2	16.82	0	2	0
3.	Gogolinek	164	1	11.6	0	0	1
4.	Goscieradz	441	2	18.56	0	2	0
5.	Koronowo	10740	11	66.59	1	10	0
6.	Lucim	543	3	21.06	1	2	0
7.	Lasko Male	199	1	6.38	0	1	0
8.	Makowarsko	1326	3	13.34	0	3	0
9.	Morzewiec	192	3	18.74	1	2	0
10.	Okole	684	2	8.3	1	1	0
11.	Samociazek	539	1	1.74	0	1	0
12.	Sitowiec	199	1	9.86	0	1	0
13.	Tryszczyn	1069	14	82.14	3	11	0
14.	Wieżowno	410	1	9.86	0	1	0
15.	Witoldowo	360	2	11.02	0	2	0
16.	Wtelno	1020	1	5.51	0	1	0
Total			51	315.44	7	43	1

Source: author's own study based on the data from The Koronowo Town and Borough Office

The rural inhabitants more frequently applied for financial aid under RES as they submitted 40 applications for granting financial aid. Among the beneficiaries from these areas were people living in 15 villages of the Koronowo borough. The percentage of applications submitted by these residents per one rural inhabitant amounted to 0.003, and for city residents only 0.001. In Makowarsko – the largest village commune of the Koronowo borough, with 1326 inhabitants, only three installations for the production and distribution of energy from renewable sources were reported. The same number of applications was recorded in Morzewiec (192 inhabitants), Buszkowo (402 inhabitants) and Lucim (543 inhabitants). The inhabitants who showed the greatest interest were those of Tryszczyn the population of which is 257 people smaller than that of Makowarsko and nearly ten times smaller than that of Koronowo. The owners of real estate located in this town have planned the installation of 11 photovoltaic installations and 3 heat pumps. In nearby Wtelno, where more than one thousand people are registered inhabitants, a grant for one installation with a capacity of 5.51 kW has been applied for. In other villages, one or two odd applications were submitted. Among the renewable energy sources that could be selected as part of the program, the most popular were photovoltaic installations, which constituted 82.98 % of the total submitted applications, with a total

capacity of 286.34 kW. The smallest requested installation with a power of 1.74 kW was declared on a residential home in Samociazek. Among 43 applications related to energy obtained from photovoltaics, 9 technical projects assumed the use of the maximum power for this type of installation under the co-financing, that is 9.86 kW. The applicants were the residents of Tryszczyn (2 installations), Koronowo, Lucim, Goscieradz, Sitowiec, Morzewiec, Gogolin and WieszowNo (1 installation each).

The residents of Koronowo submitted 10 applications in which photovoltaic installations with a total power of 64.09 kW were requested (Table 3).

Table 3

Data on photovoltaic installations requested by the city residents

No	Rated power [kW]	Number of panels [pcs]
1.	3.48	12
2.	4.35	15
3.	4.93	17
4.	5.51	19
5.	6.67	23
6.	6.96	24
7.	6.96	24
8.	7.25	25
9.	8.12	28
10.	9.86	34
Total	64.09	221

Source: author's own study based on the data from The Koronowo Town and Borough Office

The household demand from the city of Koronowo for energy coming from photovoltaic systems amounted to an average of 6.41 kW. In rural areas, installations with a total capacity of 248.85 kW were reported, of which 222.25 kW for photovoltaic panels. The average power of the proposed installation using the photovoltaic effect in the villages was 7.41 kW.

The calculations clearly proved that the return period of investments in the installation of photovoltaic panels implemented with the use of public funds was on average 39 months shorter for assembly in both residential and outbuildings or on the ground than private installation of renewable energy installations (Table 4). The longest return period was for photovoltaic installations with 1.74 kW and 2.32 kW. In the case of private investments, covering the assembly costs is estimated at nearly 90 and 102 months, depending on its location. The full reimbursement therefore occurs after 7.5-8.5 years of use. With the use of the co-financing, this time is shortened to 4-5 years of owning a renewable energy source. According to the calculations, the return period of the remaining sizes of installations is shorter. The most economical was the installation with a capacity of 2.61 kW, which covers monthly electricity bills amounting to PLN 125. The return period of own contribution under Action 3.1 on a residential building was only 3.5 years and a year longer if the investment was made on another building or the ground. Failure to receive public funds extends the return period of the same installation by more than 3 or 4 years.

The installation with the maximum power (9.86 kW) available as part of the action that enjoyed the greatest interest when assembling within a residential home returns after 3 years and 9 months, and for installations in other permitted places – in less than five years.

Table 4

**Time of return of investments carried out on residential buildings (VAT 8 %),
 on an outbuilding or the ground (VAT 23 %), in RES investments carried out
 without subsidies and with co-financing**

No	Power of installation [kW]	Average return on investment in months			
		Investment carried out privately, VAT 8 %	Investment carried out privately, VAT 23 %	Investment carried out with co-financing, VAT 8 %	Investment carried out with co-financing, VAT 23 %
1.	1.74	89.32	101.73	47.97	60.37
2.	2.32	89.32	101.73	47.97	60.37
3.	2.61	80.39	91.55	43.17	54.34
4.	3.19	81.88	93.25	43.97	55.34
5.	3.77	82.94	94.46	44.54	56.06
6.	4.35	83.74	95.37	44.97	56.60
7.	4.93	84.36	96.07	45.30	57.02
8.	5.51	84.85	96.64	45.57	57.36
9.	6.09	85.26	97.10	45.79	57.63
10.	6.67	85.60	97.49	45.97	57.86
11.	6.96	82.45	93.90	44.28	55.73
12.	7.54	82.94	94.46	44.54	56.06
13.	8.12	83.37	94.94	44.77	56.35
14.	8.70	83.74	95.37	44.97	56.60
15.	9.28	84.07	95.74	45.15	56.82
16.	9.86	84.36	96.07	45.30	57.02
Average		84.29	95.99	45.26	56.97

Source: author's own study based on the data from The Koronowo Town and Borough Office

The interest in air heat pumps for hot utility water was over six times smaller than that in photovoltaics. There were 7 applications registered in the borough, of which 6 came from rural areas. All pumps in technical designs had a capacity of 2.5 kW, which covers the daily demand for hot water for 3-5 people permanently living in the household, which amounts to an average of 300 litres.

One application, the beneficiary of which was a resident of Gogolinek, concerned the demand for a solar installation with a surface of 5.7 m² and a capacity of 11.6 kW.

Conclusions

- 1) The borough of Koronowo (an urban-rural commune), as one of the largest regions in Kujawsko-pomorskie Province, only used half of the possibilities of supporting activities for renewable energy sources.
- 2) Rural residents, rather than those of cities, were more eager to use investment support to generate and distribute energy from renewable sources.
- 3) Most applications were received from the village of Tryszczyn, which may be related its close vicinity of the city of Bydgoszcz and numerous housing investments in this town undertaken recently.

- 4) The greatest interest of the inhabitants of the Koronowo borough was demonstrated for activities involving the installation of photovoltaics. Other micro-installations were chosen to a rather small extent (heat pumps, solar panels). No demand for pellet boilers was reported.
- 5) Photovoltaic installations with an average power of 1 kW higher than the same installations in the city were selected for installation in rural areas.
- 6) The return period of investments made with the share of public funds was on average 39 months shorter than in the case of private installation of RES installations and amounted to 3 years and 9 months for assembly in a residential house and 4 years and 8 months for assembly in/on other buildings or on the ground.
- 7) The installations with the smallest power: 1.74 kW and 2.32 kW were characterized by the longest period needed to return the investment. Persons reporting the demand for such power spend 900-1200 PLN annually on electricity bills.

Bibliography

1. Gmina miejsko-wiejska Koronowo, powiat bydgoski (The urban-rural borough of Koronowo, the county of Bydgoszcz), www.bydgoszcz.stat.gov.pl/vademecum/vademecum_kujawsko-pomorskie/portrety_gmin/powiat_bydgoski/gmina_koronowo.pdf. Access: 21.01.2019.
2. Krupnik, K., Brozek, M. (2008). *Eko-rozwoj terenow wiejskich a odnawialne zrodla energii* (Eco-development of countryside with renewable energy sources aspect), *Infrastruktura i ekologia terenow wiejskich*. No 3, pp. 93-101.
3. Lorenc, J., Działanie 3.1. Wsparcie wytwarzania i dystrybucji energii pochodzącej ze źródeł odnawialnych, konkurs nr RPKP.03.01.00-IZ.00-04-212/18 (Action 3.1. Supporting generation and distribution of energy from renewable sources, competition no. RPKP.03.01.00-IZ.00-04-212/18), www.mojregion.eu/index.php/rpo/zobacz-ogloszenia?mmid=258. Access: 18.01.2019.
4. Materiały Urzędu Miasta i Gminy Koronowo na temat instalacji OZE (Materials from the Koronowo Town and Borough Office on RES installations).
5. Mickiewicz B., Zuzek D. (2012). Rozwój rynków odnawialnych źródeł energii w Polsce w świetle idei zrównowoczonego rozwoju, (Development of the renewable energy sources market in Poland in the light of the idea of sustainable development), *Multiplikacyjny efekt wykorzystania biomasy w regionalnym rozwoju*, Słowacja, pp. 20-28.
6. Snarski, S.J. (2015). *Kierunki i poziom wsparcia gmin w zakresie odnawialnych źródeł energii w województwie podlaskim w ramach Programu Rozwoju Obszarów Wiejskich 2007-2013 oraz perspektywy wsparcia 2014-2020*. (Directions and the level of support of communes in the field of renewable energy sources in podlaskie voivodeship under rdp 2007-2013 and the prospects of support under rdp 2014-2020), *Ekonomia i środowisko*, No 3(54), pp. 213-222.
7. Szczerebowki, R., Cerań, B. (2013). *Możliwości rozwoju i problemy techniczne małej generacji rozproszonej opartej na odnawialnych źródłach energii*. (Small scale, distributed power generation based on renewable energy sources – possibilities for development, cost of electricity production, and technical problems), *Polityka energetyczna*, Tom 16, Zeszyt 3, pp. 193-205.
8. Sasinowski, M. (2017). *Wsparcie gmin dla instalacji odnawialnych źródeł energii na przykładzie gminy Lomża*. (Support of boroughs for renewable energy source installations, on the example of the borough of Lomża), *Młody Jurysta*. 4: 66-79.
9. Sobczyk, W., Baran, T. (2016). *Konkurencyjność technologii odnawialnych źródeł energii*. (The competitiveness of renewable energy Technologies), *Edukacja- Technika- Informatyka*, No 1 (15), pp. 141-146.
10. *Statystyka - liczba ludności w gminie Koronowo stan na dzień 31 grudnia 2018 r.* (Statistics – the population of the borough of Koronowo as of 31 December 2018), www.bip.koronowo.pl/?cid=509. Access: 21.01.2019.
11. Wielewska, I. (2015). Ecological investments as a necessary condition for sustainable development of agribusiness companies [in:] *Economic Science for Rural Development. Rural Development and Entrepreneurship. Proceedings of the International Scientific Conference*, No 39, Latvia University of Agriculture, Jelgava, pp. 47-56.
12. Wielewska, I. (2016). Position of energy obtained from agricultural biogas in sustainable power industry. *Economic Science for Rural Development. Proceedings of the International Scientific Conference*, No 42, Latvia University of Agriculture, Jelgava, pp. 179-185.
13. Wielewska, I., Plonka, A., Kupczyk, A. (2018). Renewable Energy and its Impact on the Development of Rural Areas, *Economic Science for Rural Development*, No 47, Latvia University of Agriculture, Jelgava, pp. 377-385.

DETERMINANTS OF THE USE OF SUBSIDIES FOR THE DEVELOPMENT OF RURAL AREAS BY SMALL AGRICULTURAL HOLDINGS: CASE OF POLAND

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Abstract. The study analysed factors influencing farmers' decisions on the use of subsidies for rural development in small farms in Poland. The study included technical, economic and social features of 1,485 farms with an area of up to 10 ha of UAA participating in the FADN system in 2016. Applying an econometric probit model, variables were identified that should be taken into account when developing rural development policy aimed at increasing the likelihood of using subsidies in farms and thus fostering the achievement of the CAP objectives. The study showed that four variables were significant of eleven analysed. They presented a good fit into the model, as evidenced by the used measures for assessing the quality of the model (coefficient R^2_{calc} and ROC curve). It was found that the decision to use subsidies for rural development in small farms in Poland depends on the farmer's level of education, the quality of the land, the area of arable land and the efficiency of agricultural activity. The chance of using subsidies unrelated to production in small farms grows with increasing area of arable land. On the other hand, the chance of using subsidies for rural development decreases with the increase in the farmer's level of education, better soil quality and increased agricultural productivity. The presented research shows that the characteristics of farmers (education), technical characteristics of farms (soil quality, agricultural area) and the agricultural system (agricultural productivity) are important aspects that should be taken into account in the creation of a new conceptual framework for rural development policy to intensify use of subsidies by farmers from small farms. A comprehensive approach to agricultural development programs, including a whole range of factors that influence farmers' decisions on the use of subsidies for rural development will bring tangible results in the form of significant and sustainable development.

Key words: subsidies, rural development, small farms, logit model.

JEL code: Q18, Q12, R58.

Introduction

Small farms, as the history of economic development indicates, even in a highly technically developed agriculture remain a key player in food production and job creation in rural areas (Czyżewski A., Stepień S., 2013). They also play an important role in the delivery of public goods, social services and environmental services, while contributing to soil conservation, watershed services, biodiversity, and carbon sequestration, as well as poverty reduction and food security (FAO, 2004). Small farms are an important element of European rural areas. However, without a properly targeted agricultural policy and an active promotion the development of small farms, it will be difficult for them to survive in the current reality. The recent debates on the shape of the CAP after 2020 clearly indicate that this policy should be more flexible. Member States are to be given more discretion as to how distribute their allocations under the CAP. This will allow them to develop customized programs responding to the problems of farmers and wider rural communities in the most effective way (European Commission, 2017). Most small farms without public support have no chance of surviving on an increasingly demanding and competitive market. To increase their income, they must either go to high-value agricultural production or increase the share of income from non-agricultural sources (Gulati A., Delgado M. N. C., Bora S., 2005). This is possible, inter alia, thanks to the support of agriculture under the second pillar of the CAP. Farmers have the option of

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applying for non-production subsidies targeted at supporting rural development. These subsidies include, among others, agri-environmental subsidies, subsidies for areas with unfavourable conditions for agricultural production, agricultural advisory services, subsidies to improve the quality of agricultural products, training, afforestation and maintaining the ecological balance of the forest environment. So far, a number of studies have been carried out relating to the issue of subsidies in agriculture. The research issues addressed included allocation of subsidies in agriculture, impact of subsidies on production and economic results of agricultural holdings, environment, rural community, development of rural areas, as well as identification of factors determining their use (Lakner S., 2009; Fan B., 2011; Rizov M. et al., 2013; Mary S., 2013; Kazukauskas A., Newman C., Sauer J., 2014; Li J., Xu Y., 2015; Cimpoeis L., 2015; Pechrova M., 2015; Balezentis T., De Witte K., 2015; Sun W., Zhai Y., 2016; Ferto I., Zoltana B., Varga A., 2016; Kravcakova V., Kotulic, 2016; Capitanio F. et al., 2016; Soliwoda M., 2017; Wieliczko B., Kurdys-Kujawska A., Herda-Kopanska J., 2017; Wieliczko B., Kurdys-Kujawska A., Sompolska-Rzechula A., 2018; Kurdys-Kujawska A., Sompolska-Rzechula A., 2018; Li J., 2018; Lemanowicz M., 2018; Lakner S., 2018). It seems, however, that the problem of factors determining farmers' decisions on the use of subsidies not related to production has not yet been sufficiently examined. There are many programs in Poland supporting small farms. The question of who benefits from them is worth answering. A better understanding of the factors that determine farmers' decisions regarding the use of non-production subsidies is key to creating effective farmer support programs. Considering the importance of this topic, the main goal of this research study is to identify and assess factors affecting farmers' decisions on the use of subsidies for rural development in small farms in Poland.

Material and methods

The study used farm data that was available in the Polish Farm Accountancy Data Network (FADN). For the research, 1485 farms classified as very small and small were selected. These are entities in which the area of agricultural land amounts to no more than 10 ha. The owners of farms mostly had basic vocational education in agriculture (38.31 %). At the same time, every fifth farmer had basic vocational non-agricultural education, non-agricultural secondary education or agricultural secondary education. Only 4.71 % of farmers in the sample had basic education. Persons managing small farms were on average 49 years old. The average area of land used was 6.69 ha. In more than half of small farms, agricultural income was equal to or exceeded PLN 15,462 (app. EUR 3,600). A significant part of farms (97.71 %) demonstrated the ability to self-finance their activities and create savings as part of operating activities. To a lesser extent, the surveyed entities used loans or borrowings (15.21 %). In 27.28 % of the surveyed farms, no investments were made. On the other hand, in 34.41 % of farms the value of sold fixed assets was higher than the value of purchased and produced fixed assets. Non-productive subsidies received 53.73 % of the farms covered by the study. In more than half of them, the amount of subsidies received was above PLN 1,534 (app. EUR 360). The value of received subsidies showed very large variation (coefficient of variation of 254 %). The minimum amount of subsidies was PLN 188 (app. EUR 45), while the maximum amount was PLN 100,000 (app. EUR 23,300). To estimate the likelihood of small farmers benefiting from subsidies for rural development, logistic regression was applied¹. In linear regression models, a linear relationship is assumed between the explained variable (Y) and the explanatory variable (X). The

¹ A detailed description of logit modelling along with the assessment of its quality can e.g. in Kurdys-Kujawska A., Sompolska-Rzechula A. (2018), Determinants of Farmers Demand for Subsidized Agricultural Insurance in Poland, Proceedings of the 2018 International Conference "Economic Science for Rural Development 2018", No 47, Jelgava, LLU ESAF, pp. 164-173 DOI 10.22616/ESRD.2018.019.

dependent variable is of a continuous type. However, in the case of logistic regression, it is assumed that the dependent variable is dichotomous or binary, i.e. $Y_i = 0$ or 1 for all $i = 1, \dots, n$. The regression model using the logistic function has the form:

$$p_i = \frac{\exp(\beta_0 + \beta_1 X_i)}{1 + \exp(\beta_0 + \beta_1 X_i)} \quad (1)$$

where: β_0, β_1 are model parameters, X_i independent variables that can be both qualitative and quantitative, p_i is the probability that $Y_i = 1$. After linearization of equation (1), we obtain (Fratczak E., 2018):

$$\frac{p_i}{1 - p_i} = \exp(\beta_0 + \beta_1 X_i) \quad (2)$$

In this case $\frac{p_i}{1 - p_i}$ is called odds, and the log odds function is called logit. The form of the logit-based model is as follows:

$$p'_i = \ln\left(\frac{p_i}{1 - p_i}\right) = \beta_0 + \beta_1 X_i \quad (3)$$

Odds are defined as the ratio of the likelihood of occurring of an event and the probability of an event not occurring. Due to the fact that the logistic function is nonlinear, the direction coefficient β_i represents the change in logic caused by the change of X by one unit. In the context of odds, the interpretation of the directional coefficient is as follows: for X variable having a continuous value $\exp(\beta_i)$ is an increase in odds $Y = 1$ for each unit of growth of X variable; for X variable having the dichotomic value $\exp(\beta_i)$ is an increase in the odds that $Y = 1$, when $X = 1$ in relation to the situation when $X = 0$.

For the study selected were variables, which may influence farmers' decisions to use subsidies for rural development. The model uses a set of explanatory variables and the dependent variable is the receipt of subsidies for rural development (Y). Explanatory variables are: X_1 - farmer's level of education (1- elementary, 2 - non-agricultural basic vocational, 3 - agricultural basic vocational, 4 - non-agricultural secondary, 5 - agricultural secondary, 6 - non-agricultural tertiary, 7 - agricultural tertiary); X_2 - the age of the farmer (in years); X_3 - own work inputs (FWU); X_4 - soil quality index; X_5 - area of agricultural land (ha); X_6 - income from agricultural activity (PLN); X_7 - the ability to self-finance activities and create savings as part of operating activities (yes -1; No - 0); X_8 - total liabilities (yes - 1; 0 - no); X_9 - profitability of production (%); X_{10} - gross investment value (PLN); X_{11} - gross value added (PLN).

Empirical results

The analysis of the results of the estimation of the model parameters of the probability of using subsidies for rural development by small farms in Poland showed a statistical significance of four variables: X_1 - the level of education of the farmer; X_4 - soil quality index; X_5 - area of agricultural land (ha); X_{11} - gross value added (PLN). The empirical results obtained from the estimation of the logit model are presented in Table 1.

Table 1

Evaluation of logit model parameters

Variable	Variable	Parameter valuation	p-value	Odds ratio
	constant	2.053012	-	-
X_1	Farmer's education level	- 0.084644	0.036818	0.9188
X_4	Soil quality index	-3.620743	0.000001	0.0268
X_5	UAA	0.22309	0.000001	1.2499
X_{11}	Gross value added	-0.00002	0.002039	0.9999

Source: authors' calculations

Table 2 present the accuracy of farm classification based on the elaborated model.

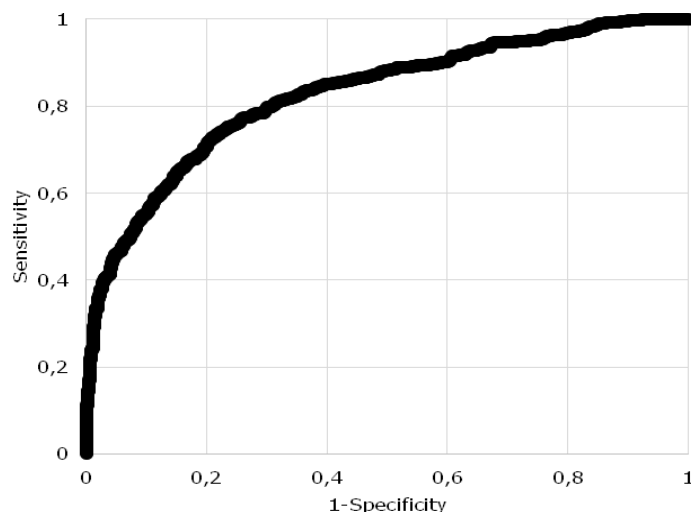
Table 2

Accuracy of the logit model classification

Classification of holdings based on the logit model	Actual classification of the farm		Overall accuracy of the classification
	$y_i = 1$	$y_i = 0$	
$\hat{y}_i = 1$	627	204	74.47 %
$\hat{y}_i = 0$	171	483	
Sensitivity, specificity	78.75 %	70.31 %	

Source: authors' calculations

The assessment of the quality of the model was based on the value of the coefficient R^2_{calc} (74.47 %) and the ROC curve (Figure 1). The results indicate that the classification based on the model is much better than random. The results of the Hosmer-Lemeshow test indicate that there are No significant differences between the empirical and theoretical numbers that result from the estimated logistic regression models. The model has a high ability to detect objects that do not have a given feature, i.e. the use of subsidies for rural development, as evidenced by high sensitivity values (78.75 %) and model specificity (70.31 %).



Source: authors' calculations

Fig. 1. The ROC curve for model

The area under the ROC curve equals 0.82 and is significantly larger than 0.5 (at a significance level greater than 0.000001).

In the model, the negative, statistically significant impact on the dependent variable is exercised by: farmer's level of education, soil quality index and gross value added. This means that the higher the farmers' level of education, the higher the soil quality index and the higher the gross value added, the less likely they are to use subsidies for rural development by small farms in Poland. However,

the area of agricultural land has a positive, statistically significant impact on the dependent variable. This means that the larger the area of agricultural land, the higher the probability of using subsidies not related to production.

Discussion

The research results bring new insights into the considerations concerning the identification of factors affecting the probability of using subsidies directed to rural development unrelated to production by small farms in Poland.

Assuming the invariability of the other factors included in the model, first in relation to the farmer's education, the results indicate that the level of education determines decisions related to making use of subsidies by small farms. With the increase of the farmer's level of education by one category, the chance of benefiting from subsidies for rural development decreases by 8.11 %. Better educated farmers with higher qualifications are more likely to look for better paid work outside agriculture. The possibility of shifting labour resources and off-farm employment make them less interested in undertaking activities for the development of a farm. On the other hand, farmers with lower education, without appropriate qualifications, training and skills may have difficulties in seeking work outside agriculture. The possibility of using these subsidies allows them to adapt the farm to changing market demands, improve the quality of agricultural products, or, as in the case of LFA subsidies, compensate for lower incomes. Thus, subsidies may weaken non-agricultural activity of small farm owners.

Secondly, small farms with higher soil valuation rates are less likely to benefit from non-production subsidies. An increase in the soil quality index by one unit means that the chance of using these subsidies by small farms is down by 97.32 %. Higher production value of soil encourages small farm owners to make full use of its natural resources, which contributes to increasing agricultural income. In addition, these results confirm that subsidies for the development of rural areas, in particular subsidies for farms located in less favoured areas are an important tool for compensating for the losses in agricultural incomes and may also condition their further functioning.

Thirdly, the efficiency of agricultural activity is also an important determinant of subsidizing the development of small farms. At the same time, as the results indicate, the chance to use non-production subsidies will remain almost unchanged, with the increase of gross value added by PLN 1,000. This means that irrespective of economic performance, which is a reflection of production efficiency, small farms are willing to use subsidies to improve the overall performance of the farm, including the increase in agricultural productivity.

Fourthly, the increase in the area of agricultural land by 1 ha enhances by 25 % the chances of using subsidies unrelated to production. The lack of suitable land acreage may force farmers to undertake work outside of the farm. The area owned is mainly used for cultivation only for the needs of the farmer's household. This may suggest a lower inclination of farmers from farms with a smaller area to undertake activities for the development of their farm.

Conclusions

The study presents the results of a research on the identification and assessment of factors affecting farmers' decisions on the use of subsidies for rural development in small farms in Poland. Based on literature studies and the availability of data, explanatory variables were selected. The study included eleven variables related to technical, economic and social characteristics of small farms. Based on the conducted research, it can be concluded that the level of farmer's education,

soil quality and gross value added reflected in the effectiveness of agricultural farms have a significant negative impact on the use of non-production subsidies by small farm owners. The chance of using subsidies unrelated to production by small farms in Poland decreases by 8.11 % with an increase of the farmer's level of education by one category, and will decrease by 97.32 % with a growth in the soil quality index by one. On the other hand, it remains almost unchanged, with the increase of gross value added by PLN 1,000. In turn, the area of agricultural land has a significant positive impact is the use of subsidies in small farms. Increasing the area of agricultural land by 1 ha raises by 25 % the chance of using non-production subsidies.

The obtained results have a cognitive and an application-oriented character. They help to enhance the knowledge of the factors determining the decisions of small farms on the use of non-production subsidies. They can be a contribution to further research on subsidizing agriculture and they can also be used by public institutions responsible for promoting and formulating rural development policy.

Bibliography

1. Balezentis, T., De Witte, K. (2015). *One-and-multi Directional Conditional Efficiency Measurement-Efficiency in Lithuanian Family Farms*, European Journal of Operational Research, 245.
2. Capitanio, F., Gatto, E., Millemaci, E. (2016). *CAP Payments and Spatial Diversity in Cereal Crops: An Analysis of Italian Farms*, Land Use Policy 54.
3. Cimpoeș, L. (2015). *Subsidies and their Impact on the Competitiveness of the Agricultural Sector in Moldova*. Proceedings of the 7th International Scientific Conference Rural Development 2015.
4. Czyżewski, A., Stępień, S. (2013). *Ekonomiczno-społeczne uwarunkowania zmian paradygmatu rozwoju rolnictwa drobnotowarowego w świetle ewolucji Wspólnej Polityki Rolnej (Economic and Social Conditions of Changes in the Paradigm of Small-scale agriculture development in the light of the evolution of the Common Agricultural Policy)*. Problemy Drobnych Gospodarstw Rolnych, No 2.
5. European Commission 2017. Retrieved: <http://www.europarl.europa.eu>. Access: 7.02.2019.
6. Fan, B. (2015). *Effect Evaluation and Improvement Measures of the Subsidy Policy of Financial Benefit*. Farmers Finance Research, 4.
7. FAO (2004). *Socio-economic Analysis and Policy Implications of the Roles of Agriculture in Developing Countries*. FAO Research Programme Summary Report. Rome: FAO.
8. Ferto, I., Zoltan, B., Varga, A. (2016). *Impact of EU Subsidies on the Rural Areas in Hungary*. Paper prepared for presentation at the 160th EAAE Seminar 'Rural Jobs and the CAP', Warsaw, Poland.
9. Frątczak, E. (2018). *Regresja logistyczna jako narzędzie modelowania poziomu i jakości życia (Logistic Regression as a Tool for Modeling the Level and Quality of Life)*. [in:] Jakość życia. Konsumpcja. Oficyna wydawnicza SGH, Warszawa.
10. Gulati, A., Delgado, M.N.C., Bora, S. (2005). *Growth in High-value Agriculture in Asia and the Emergence of Vertical Links with Farmers*. Linking Small-scale Producers to Markets: Old and New Challenges. Washington D.C.: The World Bank.
11. Kazukauskas, A., Newman, C., Sauer, J. (2014). *The Impact of Decoupled Subsidies on Productivity in Agriculture: a Cross-country Analysis Using Microdata*. Agricultural Economics, 45, 3.
12. Kravčáková, Vozarova, I., Kotulic R. (2016). *Quantification of the Effect of Subsidies on the Production Performance of the Slovak Agriculture*. Economics and Finance, 39.
13. Kurdyś-Kujawska, A., Sompolska-Rzechuła, A. (2018). *Determinants of Farmers' Demand for Subsidized Agricultural Insurance in Poland*. Proceedings of the 2018 International Conference „Economic Science for Rural Development”, No 47 Jelgava. DOI 10.22616/ESRD.2018.019
14. Kurdyś-Kujawska, A., Sompolska-Rzechuła, A., *Wsparcie publiczne rolnictwa krajów UE w ramach WPR. Skala, dynamika i tendencje zmian (Public Support for Agriculture of EU Countries under the CAP. Scale, Dynamics and Trends of Changes)*. [in:] Soliwoda M. (ed.), *Subsydia a ekonomika, finanse i dochody gospodarstw rolniczych (4)*, Monografie Programu Wieloletniego 2015-2019, No. 77, Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej - Państwowy Instytut Badawczy, Warszawa 2018.
15. Lakner, S., Kirchweiger, S., Hoop, D., Brümmer, B., Kantelhardt, J. (2018). *The Effects of Diversification Activities on the Technical Efficiency of Organic Farms in Switzerland, Austria, and Southern Germany*. Sustainability 10, 1304.
16. Lakner, S. (2009). *Technical Efficiency of Organic Milk-farms in Germany - the Role of Subsidies and of Regional Factors*, Contributed Paper prepared for presentation at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22.
17. Lemanowicz, M. (2018). *Rural Development Programme as an Instrument of Financial Support for Agricultural Producer Groups in Poland*. Proceedings of the 2018 International Conference „Economic Science for Rural Development”, No. 49 Jelgava. DOI 10.22616/ESRD.2018.12

18. Li, J. (2018). *Agricultural Subsidies and Rural Family Entrepreneurship - Empirical Analysis Based on Chinese Microdata*. American Journal of Industrial and Business Management, 8.
19. Li, J., Xu, Y. (2015). *To Explore the Efficiency Loss of Agricultural Subsidy Policy from the Perspective of Farmers' Income*. Statistical Study, 32.
20. Pechrova, M. (2015). *The Effect of Subsidies on the Efficiency of Farms in the Liberecky Region*. Economic revue – Central European Review of Economic, 18.
21. Rizov, M., Pokrivcak, J., Ciaian, P. (2013). *CAP Subsidies and Productivity of the EU Farms*. Journal of Agricultural Economics 64(3).
22. Mary, S. (2013). *Assessing the Impacts of Pillar 1 and 2 Subsidies on TFP in French Crop Farms*. Journal of Agricultural Economics, 64(1).
23. Soliwoda, M. (2017). *Are Investment Subsidies for Farms still Unexplored? A Systematic Review*. Agrarian Perspectives XXVI. Competitiveness of European Agriculture and Food Sectors. Proceedings of the 26th International Conference, 13-15 September 2017 Prague, Czech Republic.
24. Sun, W., Zhai, Y. (2016). *The Influence of Agricultural Subsidy Policy on Farmer's Agricultural Production and Operation Intention. Take Liaoning Province as an Example*. The Agricultural Economy, 12.
25. Wieliczko, B., Kurdyś-Kujawska, A., Herda-Kopańska, J. (2017). *Mechanisms and Impulses Influencing Development of Agriculture and Rural Areas (3)*. Monographs of Multi-annual Programme 2015-2019, No. 58.1, IAFE-NRI, Warsaw 2017.
26. Wieliczko, B., Kurdyś-Kujawska, A., Sompolska-Rzechuła, A. (2018). *Economic component of ANC Payments, Example of the Farms in Poland*. Proceeding of Annual 24th International Scientific Conference „Research for Rural Development 2018”, 2, Jelgava.

WOMEN'S COOPERATION IN POLISH RURAL AREAS

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Abstract. The purpose of this paper is to present the role and importance of the Polish Farmers' Wives' Association, and to present the results of the author's own research into the financing of the associations' activity. This research is focused on analysing the activity of Polish women and the way they use EU funds in the context of rural women's associations. The author's own research was carried out in the Wielkopolska region (where the largest number of FWAs was recorded), and relied on a diagnostic survey questionnaire. The survey was conducted in January 2019. The figures collected were analysed with the use of selected statistical methods. This study provides a basis for further analyses. EU funds will certainly stimulate entrepreneurial activity among women in rural areas and will be an excellent stimulus for further action. In Poland, taking initiatives to establish the KGW is a little known phenomenon, but it is part of the concept of sustainable development. Thanks to legal changes, women can apply for EU funds, which they can use for various purposes, e.g. to promote local and regional dishes and cultural heritage. Creative activation of women in rural areas also increases their sense of entrepreneurship, which is important for them to enter public life and build cooperation between them.

Keywords: rural women, Poland, cooperation.

JEL code: Q13, Q10, Q19, Q01.

Introduction

In Poland, rural areas account for over 90 % of the national territory. According to 2016 data of the Central Statistical Office, they are home to more than 1,410,600 farms, of which one quarter are run by women. Increasingly often, women become sole or co-owners of agricultural holdings, agri-tourism establishments, care facilities or enterprises. It is therefore highly important to address the particularities of female entrepreneurship, especially in rural areas. The role of women is increasingly mentioned in both domestic and international literature (e.g. „Situation of women in agriculture and rural areas. Specifics, standards, parities and expectations,” a report by the FOCUS GROUP – CRSG, 2012; Report on the situation of women in rural areas of the EU (2007/2117(INI))) European Parliament). However, relevant research efforts must be continued. Currently, the European Union places a strong emphasis on highlighting the role and importance of women in rural areas, and takes measures to promote rural community associations. As an interesting example, the European Parliament resolution of April 5, 2011 on the role of women in agriculture and rural areas (Official Journal of the EU C296E/13 of 2 October 2012) stresses that in the medium term, women ought to be adequately represented in all political, economic and social bodies.

The interest in the role of women in rural areas is driven by the European Union's new concept for the development of remote areas, referred to as the multipurpose sustainable development model for rural areas. According to this concept, in addition to traditional agricultural activities, rural areas should also fulfil other important functions: the socio-cultural, recreational, residential and ecological function (Michalska 2013, Report Gender 2016, Piers and e.al. 2009, Report Policy Brief on Women's Entrepreneurship 2016). This implies the need to develop the service sector and make rural women socially and professionally active. In that context, rural women represent intellectual capital and other resources which, while still not fully exploited, gain new value (Davidova, e.al.2010, Banski 2015, Kozera 2014, Kaminska 2011, Sikorska-Wolak and Krzyzanowska, 2010, Tabor 2010, Sawicka 2010). Increasing the rural women's activity should include combining their family and professional

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roles, and encourage their participation in the social and political life of local communities (Kozera, 2015).

The entrepreneurship of rural women could play a key role in their personal development and in local development. Very often, women are the ones who take the first steps towards establishing a non-agricultural business, thus contributing to the survival of households and to the vitality of rural areas. The situation of women changes continuously and is impacted both by themselves and by the multi-focused measures taken by the citizens, civic organizations, state governments and international institutions. The policy put in place by the European Union and Poland should therefore encourage the women to engage in rural projects implemented to strengthen the women's role and promote all kinds of female activity. According to EU reports, the women's potential is not sufficiently exploited under the rural policy. Issues such as increasing the women's activity, participation in the labour market and contribution to social capital are not appropriately emphasized in the national development policy and, as a consequence, in the rural development policy. In turn, the research conducted by the largest Polish paying agency (the Agency for Restructuring and Modernization of Agriculture who implements EU measures in Poland), by the Ministry of Agriculture and Rural Development, and by representatives of consultancy firms specializing in raising funds under the RDP suggest that women fail to fully seize the funding opportunities provided by the Union because of socio-cultural and psychological barriers. Therefore, in order to counteract this, Polish women may currently establish Farmer's Wives' Associations (FWA).

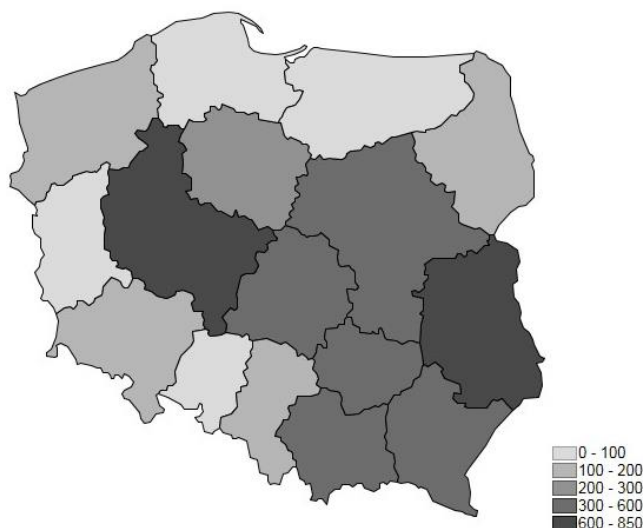
The purpose of this paper is to present the role and importance of the Polish FWAs, and to present the results of the author's own research into the financing of the associations' activity. The research task was to check what financial sources from the EU can be used by the FWAs in Poland and what these funds can be used for.

This paper relied on the desk research method. The author used the classic analysis of existing and strategic documents which served to ascertain the facts as well as for verification and presentation purposes. The selection of methods was determined by the availability of source materials, of which some were original in nature and some were secondary (reports, public statistics documents, literature dealing with food quality systems and issues related to funding for entities within the study period). Unpublished data delivered by the Agency for Restructuring and Modernization of Agriculture was related to EU subsidies for rural women's associations in Poland, as available under the 2014–2020 Rural Development Program. This research is focused on analysing the activity of Polish women and the way they use EU funds in the context of rural women's associations. The author's own research was carried out in the Wielkopolskie voivodeship (where the largest number of FWAs was recorded), and relied on a diagnostic survey questionnaire. The survey was conducted in January 2019. The figures collected were analysed with the use of selected statistical methods. This study provides a basis for further analyses.

Research results and discussion

Today, ca. 26,500 FWAs are active in Poland (Central Statistical Office, 2017). There is a dual basis for establishing an FWA. Firstly, FWAs may be established as part of what is referred to as Machinery Rings (Act of October 8, 1982 on social and professional organizations of farmers, Journal of Laws [Dz.U.] of 1982, No. 32, item 217). The second option is to create FWAs in rural areas under principles applicable to associations. The Polish legislation defines the Farmers' Wives' Association (abbreviated as FWA) as a voluntary, self-governing social organization of the rural population, which

is independent from central and local government authorities, promotes rural entrepreneurship and actively supports the rural communities. Its core idea is to improve the social and professional status of rural women and their families. As another important aspect, the FWAs promote female entrepreneurship by engaging into socio-educational and cultural projects in rural communities. Also, the task of FWAs is to initiate and implement measures designed to improve the living and working conditions of rural women, promote and develop rational housekeeping methods and various forms of cooperation and farming, represent the interests of the rural women community before public administration authorities, and develop folk culture, especially including local and regional culture (Act of 9 November 2018 on the Farmers' Wives' Associations). As provided for in the Polish legislation, FWAs seek their goals using funds coming from the members' contributions, subsidies from the state budget or local government units, donations, inheritances, gifts, own revenues, revenues derived from their assets and public charity. FWAs may carry out remunerated activities and earn revenues from: the sale of folk art (including handicrafts and folklore or art products) or regional food; the sale, rental or lease of assets; interest on cash held in accounts kept by a bank or a credit union in connection with their activity, including interest on fixed-term deposits and other forms of savings, deposits or investments existing in these accounts (Act of November 9, 2018 on the Farmers' Wives' Associations). FWAs are allowed to carry out a remunerated activity, including an economic activity. The income derived from their activity will serve the objectives set out in the statute and cannot be distributed among members. Pursuant to the Act, only one FWA can be based in one village. Conversely, one FWA can operate in one or more villages. FWAs are also allowed to carry out tasks outside their territorial boundaries, including in the Republic of Poland or abroad. The Polish registration authority for FWAs is the Agency for Restructuring and Modernization of Agriculture. According to records kept by the Agency, there are currently over 4921 FWAs active in Poland (Fig. 1).

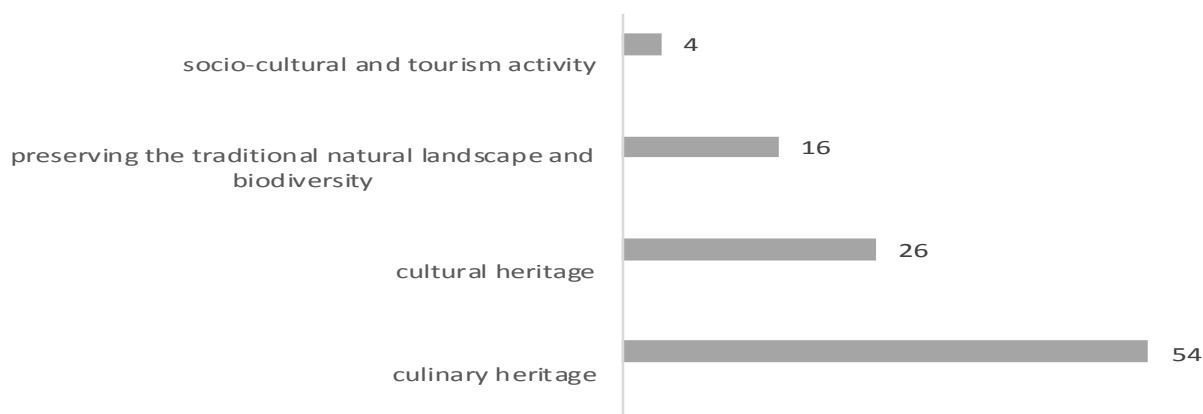


Source: author's calculations based on unpublished data of the Agency for Restructuring and Modernization of Agriculture [as on 10 January 2019]

Fig. 1. Number of FWAs in Poland

The study covered a total of 350 FWAs based in the Wielkopolskie voivodeship. This is the region with the largest number of active FWAs (847 as on 10 January 2019). Women in the 55–65 age bracket made up over 52.6 % of FWA members. Most interviewees had a secondary or vocational education (57.8 %); one out of three respondents had a primary education (33.5 %); tertiary education levels were reported by only 8.7 % of respondents.

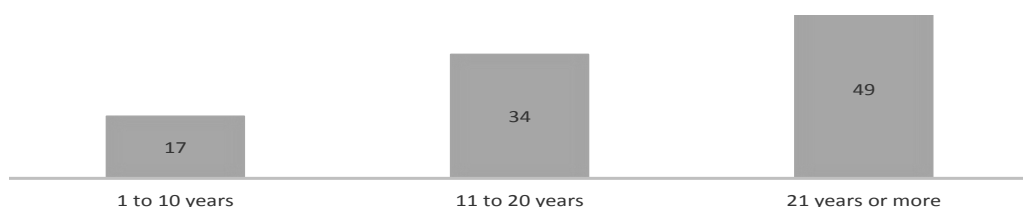
As shown by the study, rural women are socially active. The scope of their social activity varies in function of environmental and regional conditions. It also depends on the farm work cycle and on the seasons. Today's FWAs are organizations who autonomously choose their profile (e.g. cuisine, music, plastic arts, sports, theatre, education etc.) and fulfil continuous and temporary tasks for both the members and the entire local community. They cooperate with municipal councils (78 %), voluntary fire brigades (52 %), municipal cultural centres (41 %), educational institutions and non-governmental organizations. The research revealed that FWA members living in rural areas are mostly active in four thematic areas. The first one is the promotion of regional or local products (culinary heritage). The second area was the support for cultural heritage in the area of handicrafts and traditional crafts, as well as preserving certain rituals and customs, e.g. Kupala Night (26 % of FWAs surveyed). The third aspect of activity of female associations was the preservation of traditional natural landscape and biodiversity, i.e. growing native varieties of fruits, vegetables, flowers and herbs (16 % of FWAs surveyed). The last area was related to socio-cultural and tourism activities. The interviewees usually emphasized the importance of local events, art festivals and tourist attractions located in their villages (Fig. 2).



Source: author's calculations

Fig. 2. Activity of in rural women in FWAs in Wielkopolska region [%]

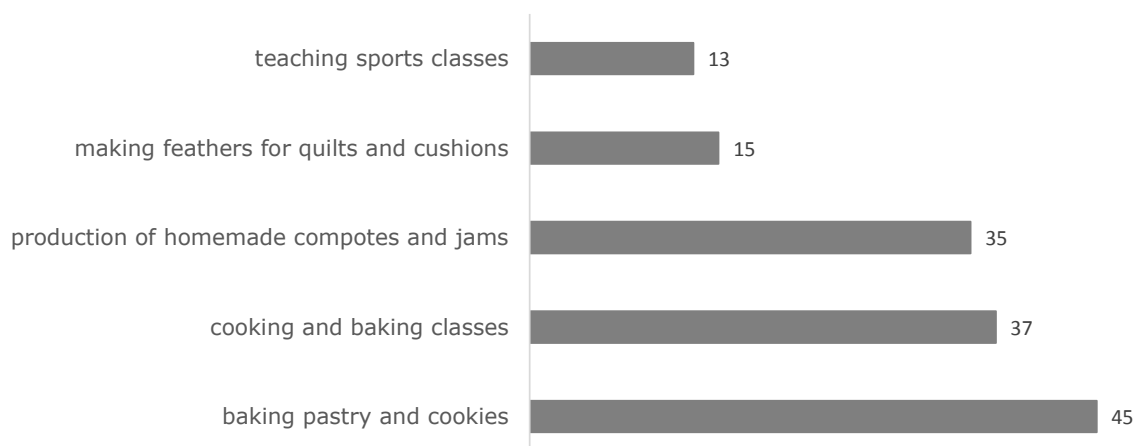
Later in the study, the FWAs were asked about their operating experience. It turns out that nearly 50 % of FWAs in the Wielkopolskie voivodeship have been active for more than 21 years whereas 34 % have been active for 11 to 20 years. The newest group of FWAs make up 17 % of the entire sample and have been active for 1 to 10 years.



Source: author's calculations

Fig. 3. Years of activity of FWAs in Wielkopolska region [%]

The FWAs offer an extremely broad range of products and services. The graph below shows the selected examples of products and services offered by FWAs in the Wielkopolskie voivodeship.



Source: author's calculations

Fig. 4. Range of products and services offered by FWAs in the Wielkopolskie voivodeship [%]

According to this study, over 67 % of FWAs are active in preparing festivals and cultural events. The key events supported by FWAs include: harvest festivals, Kupala night, Women's Day, Fat Tuesday, Potato Day. In an effort to preserve many popular and regional graphic designs, FWAs pay much attention to weaving and embroidery. Examples observed in the Wielkopolskie voivodeship include cutting out draperies of white parchment sheets. In turn, over 60 % of FWAs are active in crafts and in the production of Catholic devotions available for sale during many rural events. FWAs based in Wielkopolska willingly organize cooking and baking classes. Their services also include the production of compotes and jams. For the public, this is an opportunity to taste *pyry z gzikim*, duck roasted with apples, *plyndze*, *szagówka*, *czernina*, elderberry juice, quince *nalewka* etc. Other services offered by FWAs include making feathers for quilts, eiderdowns or cushions and teaching sports classes (13 %).

Currently, Polish women associated in FWAs are eligible for funding from the European Union. Since December 2018, the Republic of Poland has been implementing a dedicated measure to boost entrepreneurship among rural women. Essentially, this means that women register an FWA with the Agency for Restructuring and Modernization of Agriculture and, following this, apply for a subsidy from the Agency. The amount of aid depends on the number of members, as provided for in the National Register of Farmers' Wives' Associations (Table 1).

Table 1

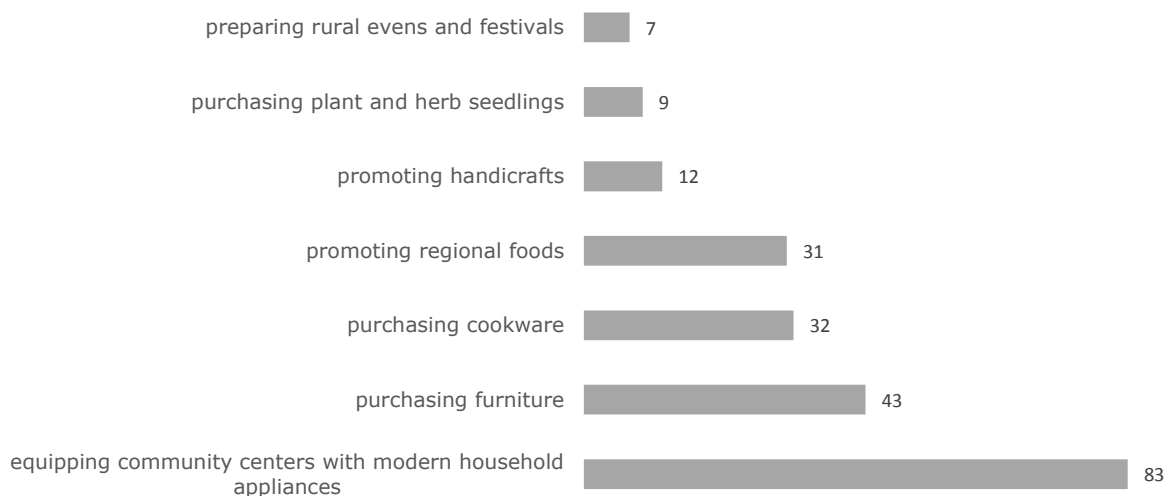
Amount of aid available to FWAs in Poland in 2019

No.	Number of members	Amount of aid [PLN]
1.	up to 30	3000
2.	from 31 to 75	4000
3.	above 75	5000

Source: author's calculations based on the Regulation of the Minister of Investments and Development of 28 November 2018 (Journal of Laws [Dz.U.], item 2229)

As shown by this study, nearly 60 % of FWAs located in the Wielkopolskie voivodeship are part of the second group with 31 to 75 members. The funds (PLN 4,000) applied for by the women are planned to be allocated to several activities (Fig. 5). The subsidy will be mainly used to: equip community centres with modern household appliances (83 %), purchase furniture (43 %), purchase

cookware (32 %), promote handicrafts (12 %), promote regional foods (31 %), purchase plant and herb seedlings (9 %), prepare rural events, e.g. *dożynki*, Potato Day, Kupala Night (7 %) etc.



Source: author's calculations

Fig. 5. **Allocation of EU subsidies granted to FWAs in Wielkopolska region [%]**

Note however that the projects intended to be implemented by the women contribute to improving competitiveness and entrepreneurship and to earning additional income from non-agricultural activities.

Conclusions, proposals, recommendations

Upon joining the European Union in 2004, Poland became eligible for additional financial support for rural development. In the context of the 2014–2020 Rural Development Program, access to funds allocated to the development of female rural entrepreneurship is of particular importance. Entrepreneurship in rural areas is seen as a way of stimulating action and gaining an additional source of income. Moreover, it gives an opportunity to become independent from social assistance, improve the quality of life and raise the standard of living of farmers and their families. Currently, in rural areas it can be seen that women in rural areas organise themselves and are active in different ways. Entrepreneurship of women living in rural areas is characterised by specificity. In Europe, on average, one in five farms is run by a woman. In the EU Member States, 13.7 million people worked permanently or temporarily in agriculture, of which 12.2 million were family members, 38 percent of whom were women (Report). Szepelska (2014) indicated that in the EU countries the economic activity of women in urban areas is higher than in rural areas. The highest participation rate of women from rural areas is in Sweden (68.7 %) and the lowest in Italy (45.4 %). Poland has a rate of 51.5 %. It is worth noting that Poland has a relatively high rate of self-employment of women. One of the possibilities of activating women in rural areas in Poland is the creation of FWAs. Funds financed by women will allow for building a local development strategy, as well as give an opportunity to have a real influence on the development of this area. In many scientific publications in Poland and abroad, such as Balinska (2014), Wojcieszak (2018), Poczta (2017), Poczta (2014), Kiryluk et al. (2018), it is stressed that the village is to be a place of work and residence, thanks to its high natural values and the creation of new jobs, it requires external support, which are certainly EU funds. The creation of the FWAs is an element of the concept of the so-called sustainable agriculture, which combines the idea of multifunctional agriculture and service and social agriculture. The idea of creating and

functioning of the FWAs may be a great opportunity to promote the region in the future, because firstly, it may generate additional income for these regions and secondly, the development of services, production of products and their sale by women associated in the FWAs may be a way to overcome the negative social and economic phenomena in rural areas. The functioning of the KGW and their creative activation increases women's sense of efficiency and entrepreneurship, which, in turn, allows them to enter public life and build a civil society. Therefore, it is important for the common agricultural policy to continue to maintain measures focused on the development of women in rural areas.

Bibliography

1. Act of October 8, 1982 on Social and Professional Organizations of farmers, Journal of Laws (Dz.U.) of 1982, No. 32, item 217
2. Act of November 9, 2018 on the Farmers' Wives' Associations (Dz.U.) poz. 2229
3. Balinska, A. (2017). Turystyka wiejska w kontekście teorii rozwoju endogenicznego (Rural tourism in the context of the theory of endogenous development). *SERiA*. No XVIII, 2. pp. 21-26.
4. Banski J. (2015). Uwarunkowania rozwoju przedsiębiorczości na wsi – wybrane zagadnienia (Conditions for the development of entrepreneurship in rural areas - selected issues). *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*. No. 102(1).
5. Central Statistical Office. (2017). <http://stat.gov.pl/>. Access:11.01.2019.
6. Davidova, S., Gorton, M., Fredriksson, L. (2010). Niskotowarowa gospodarka rolna w Europie. Raport „Niskotowarowa gospodarka rolna w UE: sytuacja dzisiaj i perspektywy na przyszłość” (Low-input farming in Europe. Report for the seminar „Low-input farming in the EU: situation today and prospects for the future”). Sibiu-Rumunia. 13–15.10.2010.
7. Dyjach, K. (2013). Teorie rozwoju regionalnego wobec zróżnicowań międzyregionalnych (Theories of regional development in the face of interregional disparities). *Annales Universitatis Mariae Curie-Skłodowska Lublin-Polonia*. Sectio H XLVII. pp. 50-51.
8. *Gender in agriculture and rural development* (2016). Luxembourg: European Institute for Gender Equality. Publications Office of the European Union.
9. Kaminska, W. (2011). Aktywność gospodarcza osób fizycznych na obszarach wiejskich w Polsce (Economic activity of natural persons in rural areas in Poland), [in:] W. Kaminska, K. Heffner (ed.), *Obszary wiejskie. Wielofunkcyjność, migracje, nowe wizje Rozwoju* (Rural areas. Multifunctionality, migration, new visions Developments). KPZK PAN. No. 133. pp. 103-127.
10. Kuryluk-Dryska, E., Beba, P., Wojcieszak, M. (2018). Czynniki wpływające na aktywność rolników w ubieganiu się o wsparcie z działania ułatwianie startu młodym rolnikom w województwie wielkopolskim (Factors influencing farmers' activity in applying for support from the measure facilitating the start of young farmers in Wielkopolskie voivodship). *Zagadnienia Ekonomiki Rolnej*. 4/2018. No. 357. pp. 103-116.
11. Komisja Europejska. 2014. Rozwój lokalny kierowany przez społeczności. Polityka Spójności na lata 2014-2020. (European Commission. Local development by communities. Cohesion policy for 2014-2020). European Commission, ec.europa.eu. [11.12.2018]
12. Kozera, M. (2015). Efektywność wykorzystania kapitału intelektualnego przedsiębiorstw rolniczych w Polsce (Effectiveness of the use of intellectual capital of agricultural enterprises in Poland). *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*. No. 102(2).
13. Kozera, M. (2014). Efektywność wykorzystania kapitału intelektualnego w przedsiębiorstwach rolniczych Wielkopolski (Effectiveness of the use of intellectual capital in companies agricultural Wielkopolska). *Przedsiębiorczość i Zarządzanie*. No. XV(6). pp. 165-179.
14. Kutkowska, B., Pilawka, T. (2012). Program odnowy wsi jako instrument wzbogacający jakość kapitału społecznego (Rural renewal programme as an instrument to enhance quality social capital). *Roczniki Naukowe SERiA XIV* (3). pp. 232-237.
15. Michalska, S. (2012). Social aspects of the functioning of small farms, *Problems of Small Agricultural Holdings*. No. 1. pp. 85–93.
16. Piers Thompson, Jones-Evans, D., Kwong, C. (2009). Women and Home-based Entrepreneurship: Evidence from the United Kingdom. *International Small Business Journal: Researching Entrepreneurship*, Volume 27, 2, pp. 227-239.
17. Poczta, W. (2010). Wspólna polityka rolna UE po 2013 roku – uzasadnienie, funkcje, kierunki rozwoju w kontekście interesu polskiego rolnictwa (Common Agricultural Policy of the EU after 2013 - justification, functions, directions of development in the context of the interest of Polish agriculture). *Wiś i Rolnictwo*. No. 3. pp. 38-55.
18. Report Policy Brief on Women's Entrepreneurship (2016). Luxembourg: Publications Office of the European Union.
19. Raport z badania Sytuacja kobiet w rolnictwie i na obszarach wiejskich. Specyfika, standardy, parytety (Research report Situation of women in agriculture and rural areas. Specifications, standards,

- parities)(2012). Warszawa: MRiRW, Konsorcjum Badawcze Focus Group Albert Terelak, Centrum Rozwoju Społeczno Gospodarczego Sp. z o.o.
20. Sawicka, J. (2009). Sytuacja kobiet wiejskich na rynku pracy i w rolnictwie (Situation of rural women in the labour market and agriculture), [in:] Piotrowska, J, Grzybek, A. (ed.): Raport. Kongres kobiet Polskich 2009. Kobiety dla Polski, Polska dla Kobiet. 20 lat transformacji 1989-2009 (Report. Congress of Polish Women 2009: Women for Poland, Poland for Women. 20 years of transformation 1989-2009.). Fundacja Feminoteka. Warsaw.
 21. Sikorska-Wolak, I., Krzyzanowska, K. (2010). Przedsiębiorczość w ujęciu teoretycznym i w praktyce, [in] K. Krzyzanowska (red.), Przedsiębiorczość na obszarach wiejskich. Stan i perspektywy rozwoju (Entrepreneurship in rural areas. State and prospects for development), SGGW, Warszawa.
 22. Situation of women in agriculture and rural areas. Specifics, standards, parities and expectations," a report by the FOCUS GROUP – CRSG, 2012; Report on the situation of women in rural areas of the EU (2007/2117(INI))) European Parliament.
 23. Szapelska, A.(2014). Bariery przedsiębiorczości kobiet zamieszkujących obszary wiejskie (Barriers to entrepreneurship for women living in rural areas). *Zeszyty Naukowe Ostrołęckiego Towarzystwa Naukowego*. No. 28. pp. 290-300.
 24. Tabor, K. (2010). Przestrzeń doradztwa i przedsiębiorczości na obszarach wiejskich (Advisory and entrepreneurial space in rural areas), [in] K. Krzyzanowska (red.), Przedsiębiorczość na obszarach wiejskich. Stan i perspektywy rozwoju (Entrepreneurship in rural areas. State and prospects for development). SGGW. Warsaw. pp. 125-141.
 25. Wojcieszak, M. (2018). Welfare farms in Poland as an example of entrepreneurial activities in rural areas, Proceedings of the 2018 International Scientific Conference „Economic Sciences for Agribusiness and Rural Economy” SGGW. No 2. pp. 161–166.

SUPPORT FOR THE DEVELOPMENT OF TECHNICAL INFRASTRUCTURE BY RURAL DEVELOPMENT PROGRAM 2007-2013 IN RURAL AREAS IN POLAND

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Abstract. The aim of the article is to determine how the Rural Development Program 2007-2013 supported the development of technical infrastructure in rural areas in Poland by implementing measure 321. The size and structure of public funds spent by types of infrastructure was determined and regional diversification was indicated in this respect. On the example of water and sewage infrastructure, the amount of funds allocation was compared to the results achieved in the field of changes in technical infrastructure in rural areas at the local level. The conditions of abortion of funds are also presented. The following data sources were used: database of the Ministry of Agriculture and Rural Development, data of the Central Statistical Office and qualitative research. The largest allocation of funds concerned water supply and sewage infrastructure, followed by marketplaces and investments in renewable energy. There were No significant differences in the structure of the allocation of funds in the regions. The effects of support are visible at the local level; the rural areas are definitely dominating in the poviat's structure, characterized by a large increase in the percentage of population served by the water and sewage network in 2006-2015.

Key words: rural areas, technical infrastructure, services for the population, RDP 207-2013.

JEL code: O18, Q18.

Introduction

Among the many problems of rural development in Poland, there is an underdevelopment of technical and social infrastructure and, consequently, problems in access to services by rural residents (Kondratowicz-Pozorska J., 2008; Heffner K, Klemens B., 2016). Both theory and practice combine the level of infrastructure equipment with the occurrence and intensity of the processes of socio-economic development (Bryden J, 2011). It is noted that infrastructure is a very important development factor (Wojtasiewicz L. 1997, Parysek J., 2001). Development in areas where there is an infrastructure gap is very difficult, if possible and largely dependent on the presence of other strong factors (Galazka A., 2004). Rural areas in Poland are mostly characterized by low access to pro-development factors and a relatively low level of development in relation to other areas, especially cities. This is accompanied by underdevelopment of infrastructure, especially technical infrastructure (Klodzinski M., 2015). Particular difficulties in this regard occur in the smallest units. Lack of access to basic elements of technical and social infrastructure in rural areas affects the living conditions of residents (Manggat I., Zain R., Jamaluddin Z., 2018) and is the foundation of economic activity, determining its structure, scope and spatial location (Satish P., 2007; Rutkowska G. 2007; Wojewodzka A. 2010; Zekic S., Kleut Z., Matkovski B., 2017).

In recent years, in Poland, a lot has changed in terms of quantitative and qualitative changes regarding infrastructure devices, mainly due to the possibility of obtaining non-returnable support for the implementation of rural infrastructure projects as part of the cohesion policy and the common agricultural policy of the European Union. Potential beneficiaries of financial support offered under EU financial instruments are very often local self-governments (LAU 2), which in their tasks have the obligation to provide residents with access to technical and social infrastructure (Ustawa o samorządzie gminnym, 1990). In practice, their activity in applying for funds varies (Rakowska J., 2016), depending on many factors, i.e. knowledge about support, the ability to prepare relevant

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documents, and financial capabilities of the unit related to providing own contribution (Stawicki M., Wojewodzka A, Zajac J., 2009).

The subject of the study is the Rural Development Program 2007-2013 (RDP 2007-2013) and its importance in the development of technical infrastructure in the rural area. The analysis covered measure 321 „Basic services for the economy and rural population” under axis III, which was entirely devoted to the support of technical infrastructure. The implementation of the measure complements the scope of support including investments planned for financing in 2007-2013 under cohesion policy, especially in programs such as regional operational programs, the Development of Eastern Poland program and the Infrastructure and Environment Program. Beneficiaries of measure 321 could be municipal self-governments or, in the case of marketplaces, inter-municipal associations. In the RDP 2007-2013, rural areas include rural, urban-rural communes and cities with less than 5,000 inhabitants. As part of the measure 321, the beneficiaries could apply for financial support for projects concerning: 1) water supply and wastewater management, in particular: a) water supply; b) wastewater disposal and treatment, including network sewage systems or farmstead sewage systems; 2) establishment of municipal waste collection, segregation and disposal system; 3) production or distribution of renewable energy, including energy from wind, water, geothermal energy, sun, biogas or biomass; 4) construction of broadband internet infrastructure; 5) construction or modernization of marketplaces (RDP 2007-2013, 2007). While discussing the issue of technical infrastructure support, it should be mentioned that municipalities could also apply for co-financing of this type of investment under the Leader approach (axis IV) of the RDP 2007-2013 (Wojewodzka-Wiewiorska A., 2017), which will not be the subject of this study.

The aim of the paper was to present how the Rural Development Program 2007-2013 supported the development of technical infrastructure in rural areas in Poland by implementing measure 321. To reach the purpose, the following tasks have been set: 1) to determine the size and structure of public funds spent by the type of supported infrastructure that could be co-financed; 2) to show the regional differentiation of the allocation of public funds; 3) to compare the amount of funds allocation with the obtained effects in the field of changes in technical infrastructure in the countryside at the local level 4) to identify of conditions for implementing measure 321 from the point of view of beneficiaries and implementing institutions.

The data was made available for the purposes of the study by the Ministry of Agriculture and Rural Development as at 31 Dec 2015 (MARD, 2017), in the form of a detailed database covering all projects implemented under measure 321. Taking into account the titles of projects, they were divided into categories depending on the type of infrastructure supported. The amount of the funds spent means the total public payments made in absolute terms according to the provisions of agreements of all beneficiaries. The paper used also the data from the Central Statistical Office. In the comparative analysis of the allocation of funds in regions, an indicator of expenditures per 1 inhabitant of rural areas was used, according to data for the Central Statistical Office of 2015 (CSO 2019). To determine the conditions for the implementation of public funds, data from individual in-depth interviews conducted in 2016 were used. Interviews were carried out with the authorities of rural communes, which were beneficiaries of funds under measure 321 (IDI, n = 2) and representatives of implementing institutions (IDI, n = 2). In addition, the source of information was the programming documents of the Ministry of Agriculture and Rural Development in Poland for the years 2007-2013 and 2014-2020. The research process used appropriate qualitative and quantitative

research methods: monographic method, content analysis and synthesis, grouping information and data using basic descriptive statistics such as arithmetic mean, median, quantiles.

Research results and discussion

1. The size and directions of spending financial resources

In Poland, PLN 773.4 million was spent on measure 321 from public funds, which constituted 10.5 % of RDP 2007-2013 funds in total. As far as the directions of spending are concerned, projects aimed at the development of water and sewage infrastructure were definitely dominant (tab. 1). At the national level, 92.27 % of the total funds of the entire operation were spent on them, implementing 82 % of all projects. Another type of infrastructure in rural areas which has been subsidized is infrastructure connected with local trade. Marketplaces were built or modernized, and expenditures for this purpose accounted for 3.53 % in the structure of expenditure of the entire measure. Projects on renewable sources received public support in the amount of 173.21 million PLN. In the structure of expenditures by directions, the share of projects covering the construction or purchase of infrastructure related to the operation of municipal waste management was small and represented 1.72 % of the total. The participation of projects supporting the development of the Internet network can be regarded as marginal. The projects differed from each other with the size of the co-financing obtained, also within a given type of infrastructure, as evidenced by basic statistical measures. The largest co-financing on average came from projects concerning the development of water and sewage infrastructure and marketplaces.

Table 1

Projects implemented under measure 321 of RDP 2007-2013 in Poland

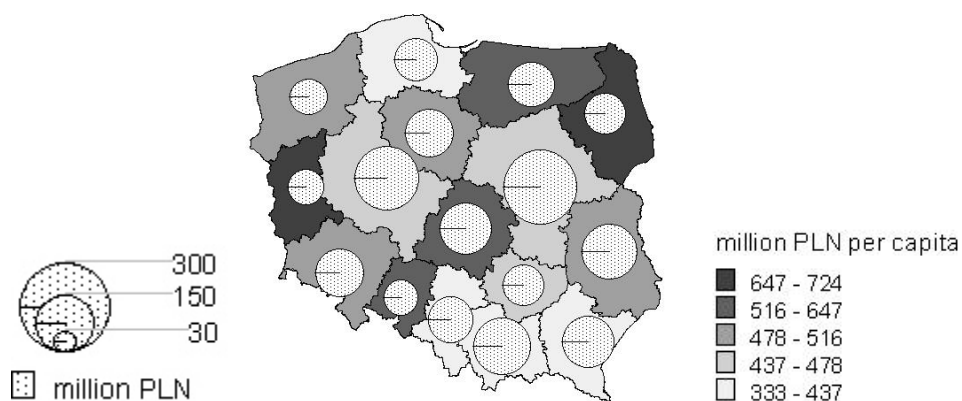
Type of infrastructure	Expenses (PLN million)	Expenses (%)	Number of projects	Co-financing of the project thousand PLN		
				average	minimum	maximum
water supply and sewage system	7135.56	92.27	4409	1618.41	11.9	10525.61
markets	273.3	3.53	247	1106.46	41.78	4381.79
renewable energy	173.21	2.24	274	632.16	23.11	3837.4
waste	132.94	1.72	384	346.2	5.68	8233.3
Internet	9.84	0.13	13	756.82	24.84	4013.95
other*	6.24	0.08	6	1432.91	75.48	3859.32
measure 321	7733.4	100	5333	1450.11	5.68	10525.61

* the title of the project does not allow assigning a project to one of the groups

Source: author's calculations based on MARD 2017 data

Analysing the structure of expenditures by type in the cross-section of regions, it can be concluded that individual regions did not differ in the directions of spending funds. In all voivodships, as in the whole country, the support of water supply and sewage infrastructure was dominant, which may result from existing needs in this area or be associated with high cost-consuming investments of this type, which without public funding could not be implemented by local governments based on own resources. Expenditure on water and sewage infrastructure constituted the smallest share in relation to the entire measure 321 in the Zachodniopomorskie Voivodeship (86.4 %), and the largest in the Opolskie and Wielkopolskie Voivodships (96 %). In absolute terms, the smallest allocation of funds took place in the Lubuskie and Opole voivodships (fig. 1), PLN 246 and PLN 250 million, respectively. They are relatively the smallest regions in Poland, which may be important in the implementation of this type of investment. In turn, the highest amount of funds in absolute terms was spent in Mazowieckie (PLN 883 million), Wielkopolskie (PLN 686 million) and Malopolskie (PLN 579 million),

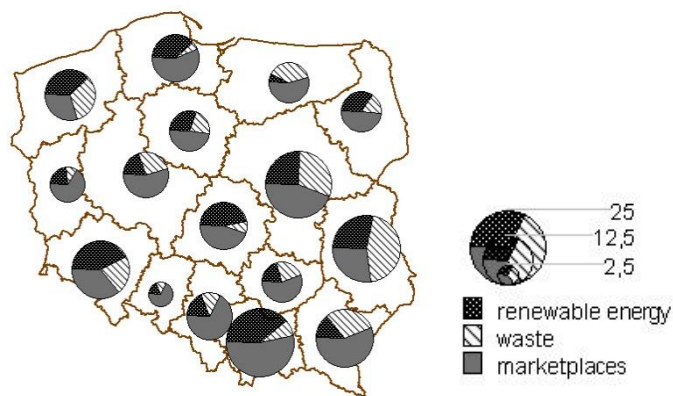
i.e. regions with relatively high development level as well as in the Lubelskie Voivodeship (PLN 551 million).



Source: author's calculations based on MARD 2017 data

Fig. 1. **Regional variation in the size of public expenditure on the development of water and sewage infrastructure in Poland under measure 321 of RDP 2007-2013**

With reference to the allocation of resources to the number of inhabitants of rural areas in individual regions, it can be stated that the largest amount of funds was spent in the Podlasie and Lubuskie voivodship (PLN 724 and 690 per capita). These are voivodships belonging to the so-called eastern walls (similarly to the Warminsko-Mazurskie Voivodeship, where the allocation was also high), characterized by a lower level of development in relation to the rest of the country. This may prove that the funds have been heavily used for neglected infrastructure. The least per capita funds - less than PLN 400 were spent in southern Poland, i.e. in the Slaskie, Malopolskie and Podkarpackie voivodships as well as in the Pomorskie voivodship (PLN 428).



Source: author's calculations based on MARD 2017 data

Fig. 2. **Regional variation in the amount of spending on infrastructure development in Poland as part of 321 RDP (PLN million)**

Less funds were spent on infrastructural projects concerning other issues, i.e. waste, renewals of energy sources or construction of marketplaces, while at the same time they enjoyed less interest from beneficiaries. In the expenditure structure of measure 321 they constituted from 4 % (Opolskie Voivodeship) to 13 % (Zachodniopomorskie Voivodeship). Expenses for the construction and modernization of marketplaces dominated in 9 regions (fig. 2), which may result from the direct motivation of self-governments by the very fact of the possibility of obtaining financial support for this purpose under the RDP or from real needs in this area. Local governments have previously treated trade infrastructure not with the most urgent needs, especially since its modernization is expensive. In the Lodzkie, Dolnoslaskie, Malopolskie, Pomorskie and Zachodniopomorskie voivodeships there was a great interest in renewable energy sources, by far the smallest in the

Warminsko-Mazurskie Voivodeship. These investments were treated as innovative and whether they were implemented or not depended on the knowledge and approach of local authorities and office staff. In individual voivodeship, there was a different interest in investments related to waste management, the largest in the municipalities of the Lubelskie and Warminsko-Mazurskie Voivodships. Internet projects were implemented only in 9 out of 16 provinces in Poland. In explaining this situation, it is necessary to take into account the fact that activities related to the Internet and renewable energy sources were introduced into the Common Agricultural Policy a bit later, due to the diagnosed needs and the adoption in 2008 of the European Economic Recovery Plan (Ledzion B., et al., 2016). After introducing these changes, it turned out that the interest of the beneficiaries in the development of the Internet is small. This resulted in the transfer of financial resources by reducing funds allocated for investments in the Internet, and increasing them to renewable energy sources, which were very popular.

2. Typology of rural areas by poviats depending on the amount of funds obtained and the results achieved

Considering the fact that the largest amount of public funds was directed to the development of water and sewage infrastructure and the availability of statistical data, the effects of the funds spent under measure 321 are shown on the example of this type of infrastructure. For the purpose of the study, the poviats in Poland¹ were divided into types depending on: (1) the amount of absorption of funds under Measure 321 (A) for water and sewage investments in rural areas (quartiles were used and the set was divided into poviats with relatively low absorption ($A \leq Q_1$), average ($Q_1 < A < Q_3$) and high ($A \geq Q_3$) and (2) changes in the percentage of population using the water supply and sewage network in 2006-2015 in rural areas (the median was used for percentage points and the set of poviats was divided into poviats characterized by low and high changes related to the population served by the networks). Thus, 12 types of rural areas were distinguished in the cross-section of poviats (tab. 2). In the structure of rural areas at the level of poviats, the dominance of three types of poviats can be found: type F (average absorption of public funds giving effects in the form of the development of the water supply network), then type H (poviats with average absorption of funds and effects in the growth of population using the sewage network) and type G (poviats with average absorption, where there was a visible increase in the number of people using both types of networks). Among poviats there are units, where the absorption of RDP resources is low, and the effects in the form of network development are above average, which certainly results from supplementing this source of support with other external means, e.g. under the cohesion policy. This applies, among others Mazowieckie, Wielkopolskie and Dolnoslaskie voivodships, which, as highly developed areas, are cheap to implement many projects simultaneously, without fear of overburdening their budgets with the necessity to provide their own contribution. Interestingly, in the Podlasie voivodship as much as 25 % of poviats is characterized by high absorption of funds, which is not accompanied by dynamic changes in the percentage of population using the network, and in every fifth poviat there is stagnation in infrastructure development with medium absorption of funds. The presented research results show that in Poland one can distinguish regions in which the greatest effects are visible in the case of the development of the water supply network. It can be a consequence of two issues. First of all, there are areas in Poland that are neglected in this respect (poorer), including those where

¹ In Poland there are three levels of territorial division of the country: voivodeship, poviat and municipality

the construction of the water supply is difficult for the municipality from an economic point of view (colonial housing).

Table 2

Rural areas in Poland according to the amount of support from the RDP 2007-2013 activity and effects in the field of water and sewage infrastructure

Type of rural areas	Characteristics of areas		Number of poviats	%	The voivodeship with the largest share of the type	
	Allocation	Type of effects			name	%
A	low	stagnation	29	9.24	Podkarpackie	20.7
B	low	water supply	18	5.73	Mazowieckie	27.8
C	low	water supply, sewage system	13	4.14	Wielkopolskie	23.1
D	low	sewage system	19	6.05	Dolnoslaskie	21.1
E	average	stagnation	31	9.87	Podlaskie, Zachodniopomorskie	19.4
F	average	water supply	47	14.98	Lubelskie	19.1
G	average	water supply, sewage system	36	11.46	Warminsko-mazurskie	16.7
H	average	sewage system	42	13.38	Wielkopolskie	28.6
I	high	stagnation	12	3.82	Podlaskie	25
J	high	water supply	19	6.05	Mazowieckie	45
K	high	water supply, sewage system	24	7.64	Malopolskie	20.8
L	high	sewage system	24	7.64	Podkarpackie	29.2

Source: author's calculations

On the other hand, some rural areas, located especially near large cities, are currently experiencing intensive development through a very dynamic increase in the number of new residents (mainly as a result of migration) and are forced to adapt their infrastructure to new realities. An important issue is also the large amount of diversity of Polish regions in the level of development (OECD, 2008), where in one region there are very well developed areas, including infrastructural ones and those characterized by infrastructure underdevelopment. Detailed conclusions in this respect could give more detailed research at the municipal level.

3. Conditions for the implementation of projects in the field of technical infrastructure

The two municipalities surveyed from the Podlasie Voivodship were characterized by deficiencies in the water and sewage infrastructure. and implemented respectively 3 and 2 projects from measure 321. According to the respondents co-financing from the RDP allowed to make up the existing arrears in the field of technical infrastructure, to improve the attractiveness of the area for residents and tourists. Among the barriers to applying for funds, first of all, there was No possibility to support road infrastructure, which could / should be built together with water and sewage infrastructure, lack of own funds for investments (especially for small municipalities); simultaneous need to modernize other elements of social infrastructure (mainly schools), which involves large financial resources and limits the possibility of implementing projects related to technical infrastructure. It was pointed out that support for RDP is very important for municipalities, also due to the ease of application and service in comparison with other support instruments. Without the RDP funds, water and sewage investments would be implemented because they are important from the point of view of the quality of life of the inhabitants, but would be significantly postponed („instead of 4 years would have been done in 15 years”). The respondents indicated that they intend to carry out projects related to the

development of technical infrastructure with co-financing from RDP, which is also interesting for those related to renewable energy.

Research on the representatives of implementing institutions shows that the municipalities affected by investments with RDP co-financing are known to them, which was reflected in the provisions of RDP 2014-2020. PROW 2014-2020 supports basic services in the countryside in the following areas: (1) construction or modernization of local roads, (2) water and sewage management, and (3) development of marketplaces or construction facilities for the purpose of promoting local products. Thus, the beneficiaries' demand regarding the possibility of road support was taken into account, which in practice met with great interest from local governments. From the point of view of the implementing institutions, municipalities are good at absorbing funds for the development of technical infrastructure, which is most often seen locally, usually RDP funds constitute a major contribution to the municipal budget. The problem that sometimes occurs concerns, for example, connecting residents to new networks, who have the option of connecting, refusing to explain economic reasons. The respondents drew attention to a significant problem related to the current refund system. Municipalities (usually poorer) to indemnify their own contribution are excessively indebted, which often results in the loss of their creditworthiness. This situation excludes municipalities to which RDP support is addressed. In the opinion of the surveyed representatives of implementing institutions, the state of water supply and sewage infrastructure improved the most among all types of technical infrastructure. The most difficult was support for the development of the Internet, which resulted from the late appearance of funding opportunities for this type of investment and the practical difficulties in implementation and ignorance of potential beneficiaries.

Conclusions, proposals, recommendations

- 1) The RDP 2007-2013 in Poland enabled the development of technical infrastructure in the rural area through measure 321, to which PLN 773.4 million was directed, i.e. 10 % of the funds of the entire Program. The largest allocation of funds concerned water supply and sewage infrastructure, followed by marketplaces and investments in renewable energy. There were No significant differences in the structure of the allocation of funds in the regions. This use of resources reflects the real needs of rural areas, which for various reasons have a need to build or modernize water and sewage infrastructure. Often, without external support, the municipalities would not be able to undertake these very expensive investments. It can be assumed that in the future the directions of infrastructural investments may change. Firstly, the important direction of the investment will be the modernization of local roads, to which, according to the expectations of potential beneficiaries, support from the RDP 2014-2020 can be obtained. In addition, after satisfying the needs of the water supply and sewage network, recognized as the basic element shaping the living conditions of the residents, the attention of beneficiaries will probably be directed to activities related to, for example, renewable energy sources treated in the examined perspective as innovative investments. This is also due to the change in the awareness of the authorities and residents and knowledge about the benefits, especially the economic benefits of using this type of energy.
- 2) The effects of support for infrastructure investments by RDP 2007-2013 are visible at the local level. In Poland, the poviats' structure is definitely dominated by rural areas characterized by a large increase in the percentage of population served by the water and sewage network in 2006-2015.

- 3) Experience from the implementation of infrastructure projects 2007-2013 shows that for the allocation of funds to take place effectively, support should be prepared very well. Any changes during the term of the documents introduce chaos and result in low interest on the part of the beneficiaries and inefficient spending of funds, which is confirmed by the example of investment in the development of the Internet network.

Bibliography

1. Bryden, J. (2011). Rural Development Indicators and Diversity in the European Union. Retrieved: <http://citeseerx.ist.psu.edu>, p. 11. Access: 20.01.2019.
2. Central Statistical Office, Local Data Base. Retrieved: <http://stat.gov.pl/bdl/>. Access: 21.01.2019.
3. Galazka, A. (2004). Uwarunkowania i stan rozwoju infrastruktury na obszarach wiejskich w okresie transformacji (Conditions and State of Development of Infrastructure in the Rural Regions during the Transformation Period). *Studia Obszarow Wiejskich*. Vol 6. pp. 145-164.
4. Heffner, K., Klemens, B. (2016), Potencjaly i strefy problemowe w zakresie świadczenia usług publicznych na obszarach wiejskich w skali regionalnej (Potentials and Problem Areas in the Provision of Public Services in Rural Areas at Regional Scale), *Studia Obszarow Wiejskich*, vol 42, pp. 26-28, doi.org/10.7163/SOW.42.2
5. Kłodzinski, M., (2015). Zagrożenia i szanse stojące przed rozwojem sektora przedsiębiorczości wiejskiej (Threats and Opportunities Facing the Developmental sector of Rural Entrepreneurship). *Wies i Rolnictwo*. No 2. (167) pp. 125-138.
6. Kondratowicz-Pozorska, J. (2008). Analiza kierunkow rozwoju usług na terenach wiejskich województwa zachodniopomorskiego w latach 2000–2006 (Analysis of Directions of Services Development in Rural Areas of West Pomeranian Region in Years 2000–2006). *Zeszyty Naukowe SGGW - Ekonomia i Organizacja Gospodarki Żywnościowej*. No. 68. pp. 117-126.
7. Ledzion, B., Grabowska, I., Kupiec, T., Płoszaj, A., Widla-Domaradzki, L., Wojewodzka-Wiewiorska, A., Rauzer A. Wojtowicz, D. (2016). *Ocena wpływu PROW 2007-2013 na jakość życia na obszarach wiejskich z uwzględnieniem podejścia LEADER (Evaluation of the RDP 2007-2013 Impact on Quality of Life in Rural Areas Taking into Account the LEADER Approach)*, Evaluation report, EGO, Warsaw, pp. 58-59; 115-116.
8. Manggat, I., Zain, R., Jamaluddin, Z., (2018). The Impact of Infrastructure Development on Rural Communities: A Literature Review, *International Journal of Academic Research in Business and Social Sciences*, 8(1), pp. 650-651.
9. Ministry of Agriculture and Rural Development. (2017). Data of the Agency for Restructuring and Modernization of Agriculture concerning the implementation of projects under the 3rd axis of the Rural Development Programme 2007-2013 from 31. Dec 2015.
10. Parysek, J. J. (2001). Podstawy gospodarki lokalnej (*Basics of the Local Economy*), Wydawnictwo Naukowe Uniwersytetu w Poznaniu, Poznan, p. 19.
11. Przeglądy terytorialne OECD. Polska. (*OECD Territorial Reviews Poland*). (2008). Warsaw: OECD, p. 14.
12. Rakowska, J. (2016). *Samorzady gmin jako beneficjenci polityki spójności UE w latach 2007-2013 (2015) (Municipal Self-governments as Beneficiaries of the EU's Policy of Cohesion in 2007-2013 (2015))*. Wydawnictwo SGGW, Warszawa, pp. 92-94.
13. Rural Development Programme for 2007-2013. (2007). Ministry of Agriculture and Rural Development. Warsaw.
14. Rutkowska, G. (2007). Analiza porównawcza infrastruktury technicznej i społecznej w wybranych gminach z wymogami UE (*Comparative Analysis of Technical and Social Infrastructure in a Selected Commune with EU Requirements*), *Inżynieria i kształtowanie środowiska*, No 2(36), pp. 64-72.
15. Satish, P. (2007). Rural Infrastructure and Growth: An Overview. *Indian Journal of Agricultural Economics*. Vol. 62, No.1, Jan.-March. pp. 33-35.
16. Stawicki, M., Wojewodzka, A., Zajac, J. (2009). Uwarunkowania absorpcji funduszy strukturalnych UE na poziomie powiatów. Analiza i rekomendacje (*Conditions of Absorption of EU Structural Funds at the Poviast Level. Analysis and Recommendations*). Ministerstwo Rozwoju Regionalnego. Warsaw. pp. 31-33.
17. Ustawa o samorządzie gminnym z dnia 8 marca 1990 r. (*The Act of 8 March 1990 on Local Government*), Dz.U. 1990 nr 16 poz. 95.
18. Wojewodzka, A. (2010). Infrastruktura jako czynnik rozwoju lokalnego i regionalnego (*Infrastructure as a Factor of Local and Regional Development*). *Logistyka* 2010; 3, pp. 1-13.
19. Wojewodzka-Wiewiorska, A. (2017). The Importance of the Leader Programme 2007 – 2013 in the Rural Areas Development in Poland, *Research for Rural Development* Vol. 2, Jelgava, pp. 97-103. DOI:10.22616/rrd.23.2017.055.
20. Wojtasiewicz, L., Czynniki rozwoju lokalnego – nowe ujęcia metodologiczne (*Local Development Factors - New Methodological Approaches*), (in): Maik W., (ed.) *Problematyka rozwoju lokalnego w warunkach transformacji systemowej*, Biuletyn KPZK PAN, vol. 177, Warsaw, p. 10.
21. Zekic, S., Kleut, Z., Matkovski, B. (2017). An Analysis of Key Indicators of Rural Development in Serbia: a Comparison with EU Countries. *Economic Annals, Volume LXII, No. 214 / July – September 2017*, p. 118.

DEVELOPMENT OF AGRICULTURAL FARMS IN TERMS OF COMMON AGRICULTURAL POLICY SUPPORT IN THE OPINION OF FARMERS

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Abstract. The rural areas are a place of living and work of much of the society and agricultural production is essential for the Polish national economy. The aim of this paper has been to determine the prospects for the development of agricultural family farms. With that in mind, an important aspect has been to diagnose the opinions of the farmers on the key sources of income, benefiting from the CAP support, the recent investment projects completed, opinions on changes in the operation of agriculture after the integration with the EU, its impact on the development potential of the farms under study as well as plans for the farms. The research material was acquired from the surveys made in 2018 which included 60 respondents residing in the Zławies Wielka commune. The survey research has demonstrated that a great majority of the respondents were living mostly from agricultural production, only some used other support than direct payments. Less than half of the respondents were making efforts to develop their farms through the investments made over the recent years. The farmers planned handing over the farm to their successors or continuing the work themselves.

Key words: agriculture, agricultural farm, the European Union, Common Agricultural Policy.

JEL code: D21, O10, Q10, Q12, Q18, Q19.

Introduction

The Common Agricultural Policy is the oldest and the most comprehensive community policy of the European Union and one of the pillars of the European integration (Bardaji I., et. al., 2009, Potter C., Tilzey M., 2005). To a great extent, it determines the operation of the agricultural sector and the situation of the rural areas of the EU member states (Piorr A., Viaggi D., 2015, Santiago-Freijanes J.J., et. al., 2018, Van de Poele L., 2015, Vlahos G., Louloudis L., 2011). The CAP determines the principles of homogenous operation, protection of and assistance to the agricultural sector in the EU member states. The CAP key objectives include the agricultural market stability, multi-functional development of the rural areas, supporting investments to diversify the operation of the agricultural farms (Benjamin C., 1994, Galluzzo N., 2017), and providing the farmers with an adequate income and living conditions. Poland's joining the European Union has created new opportunities of solving many economic and social problems (compare Kalinowski S., 2018). It is true for every sector of the Polish economy, especially agriculture (Kielbasa B., Grzelak A., 2014).

Poland's membership in the European Union has changed the economic conditions of Polish agriculture management (Chrzanowska M., 2017, Gazinski B., 2016, Kisiel R., Marks-Bielska R., 2007, Marks-Bielska R., et. al., 2011, Piecuch J., Paluch L., 2018). Prior to Poland's joining the EU, the national budget support for agriculture was inconsiderable, and in the first years of the transformation, namely in the 1990s, it hardly existed. The agricultural policy was changing too frequently and it was not part of any comprehensive long-term strategy, which limited its efficiency and effectiveness. Prior to the referendum on Poland's joining the European Union there were concerns how the rural voters would vote as the rural areas were in a difficult situation after the transformations initiated in 1989. A considerable group of the farmers were afraid of competition from imports of foreign food, which could, in their opinion, result in bankruptcy of many agricultural farms, dairies and meat processing plants, to mention just a few. On the one hand, the prospect of Poland's EU membership triggered concerns of a possible failure of the Polish agrifood market,

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however, on the other hand, it gave hope to the farmers for higher payments for agricultural production and for a greater stability of production conditions and marketing (Borys B., Slosarz P., 2003). The concerns were being eliminated with difficulty and Euro-enthusiasts were bigger and bigger in number together with direct payments and the CAP financial programmes. Interestingly, the process of Poland's integration with the European Union enhanced the volume of agricultural produce and incomes generated from it, an increase in income from the entire agricultural sector would not be possible without a considerable increase in CAP payments (Poczta W., et. al., 2012).

The evolution of agrarian systems in the countries with a fragmented land structure, including Poland, leads to a decreasing number of agricultural farms and an increase in acreage and effectiveness of enterprises developing their business. Next to the Common Agricultural Policy instruments being implemented, also the local factors show much impact on the changes (Wojewodziec T., et. al., 2017). A possibility of benefiting from the pre-accession funds and a prospect of EU membership became a strong trigger to develop new institutional frameworks to introduce a new type of agricultural policy and the system of supporting the development of rural areas and agrifood processing modernisation in Poland. A very fast launch of direct payments must be considered a success of the first months of the EU membership. In the rural areas the spirits got higher, optimism and support for Poland's integration with the European Union got definitely enhanced (Roman M., Roman M., 2018).

Despite visible deficiencies in some sectors, one must state that Poland's joining the EU and the Polish agriculture being covered by the CAP instruments have changed the conditions of agriculture operation significantly (Piecuch J., Paluch L., 2018, Roman M., Nuskiewicz K., 2013). The membership in the European Union structures translates into an almost unlimited access to a vast consumer market, which is especially important for agricultural producers; it creates new opportunities of generating income due to the EU market size and CAP subsidies.

The aim of the study has been to diagnose the farmers' key sources of income and to evaluate using EU programmes for development-enhancing investments on farms. There was also estimated the percentage of the farms keeping their accounts and the source of accounting assistance. The investment projects executed in the last 4 years have been diagnosed and the opinions of the respondents on a change in the situation of farms upon Poland joining the EU and the forecast of that situation for the successive 2 years have been provided.

Material and the research method

To verify the key assumptions of the paper, own survey research was performed. The survey covered 60 farmers from agricultural farms of various village administrations of the Zławies Wielka commune. 15 people refused to take part. The survey was made from 22 to 24 June 2018.

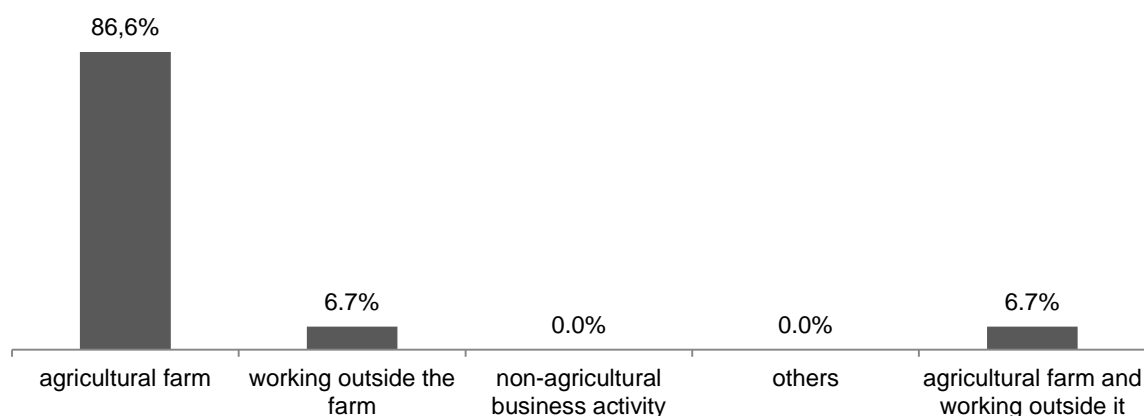
The commune is found in the kujawsko-pomorskie province, in the Torun county, between Bydgoszcz and Torun, and it covers the area of 17753 ha with the population of 13786, with 10195 people of legal age. In 2017 402 persons were registered as unemployed, including 79 people entitled to unemployment benefits. The commune's agricultural land accounts for 64 % of the total area, while woodland, most of which constitutes preserved landscape, accounts for 26 %. It is common knowledge that the Zławies Wielka commune is typically agricultural (Gmina..., 2018).

In the Zławies Wielka commune, most respondents running agricultural farms were men (60 %), whereas women accounted for 40 %. Of all the respondents, 46.7 % were people aged 41-55, 23.3 % – aged 56-65 and people aged 65 (6.7 %). The persons below 40 years of age accounted for more

than 23.3 %. Most of the farmers surveyed had a vocational education background (63.0 %), while 24.0 % – secondary school background, and 10.0 % – higher education background. The lowest percentage (3.0 %) of the respondents had a primary school background only. Among the respondents only 20.0 % declared their willingness to enhance their qualifications. In the Zławies Wielka commune, most farms fell within the range from 10 to 14.99 ha (43.3 %), many farms – from 20 to 50 ha (30.0 %) and 15 to 19.99 ha (13.3 %), whereas many fewer – from 5.0 to 9.99 ha (6.8 %) and from 2.0 to 4.99 ha (3.3 %). The survey included 2 people (3.3 %) with a farm more than 50 ha in size.

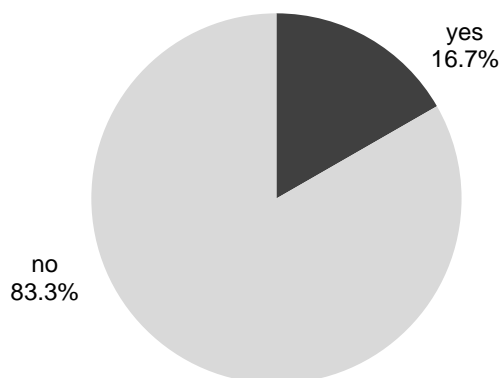
Research results and discussion

Various strategies of income diversification make it possible for the farmers to deal with changing conditions in a changing economic situation better (Pacin F., Oosterheld M., 2014, Weltin M., et. al., 2017). The farms which run additional business on top of the traditional agriculture and are diversified enough to generate income from two or more types of business activity have a chance for a greater stability from increased incomes (Barnes A. P., et. al., 2015, Edmond H., Crabtree J. R., 1994, Northcote J., Alonso A. D., 2011). The results show that 86.6 % of the respondents claimed that agricultural production was as the main source of income. Only 6.7 % said they were working outside the farm. Also 6.7 % of the respondents claimed having both income variants at the same time. As for the types of work outside the farm, working at school, in the library and in the offices of public authorities were most frequently listed (Fig. 1). Unfortunately, none of the respondents claimed running a non-agricultural business activity. The potential of the strategy much depends on the availability of the capital on a given farm. For that reason non-agricultural employment is often the most available strategy not only to ensure the household income but also to supplement the income required to keep the farm running (Meert H., et. al., 2005). The information acquired from the respondents shows that only 16.7 % of the respondents benefited from the EU assistance other than direct payments (Fig. 2), which could have been also the reason of a lack of interest in non-agricultural business activity which often requires making necessary investments (Nguyen T. H. T., et. al., 2016, Reardon T., et. al., 2000).



Source: author's calculations based on research

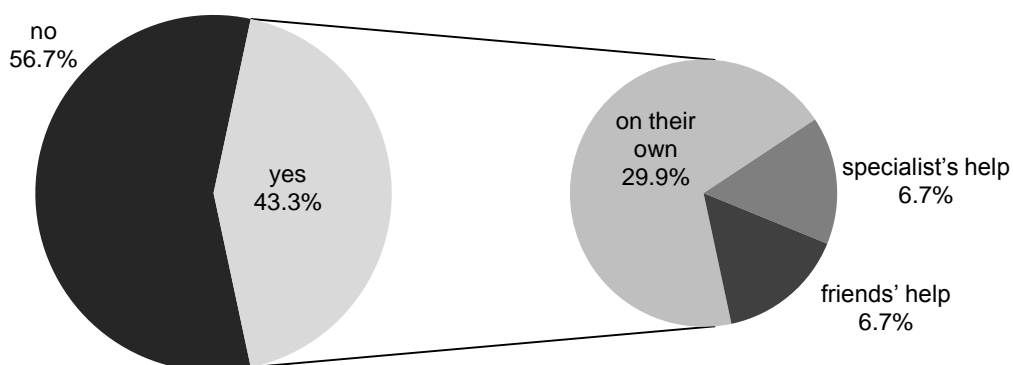
Fig. 1. Main source of income



Source: author's calculations based on research

Fig. 2. Benefiting from the EU financial support other than direct payments

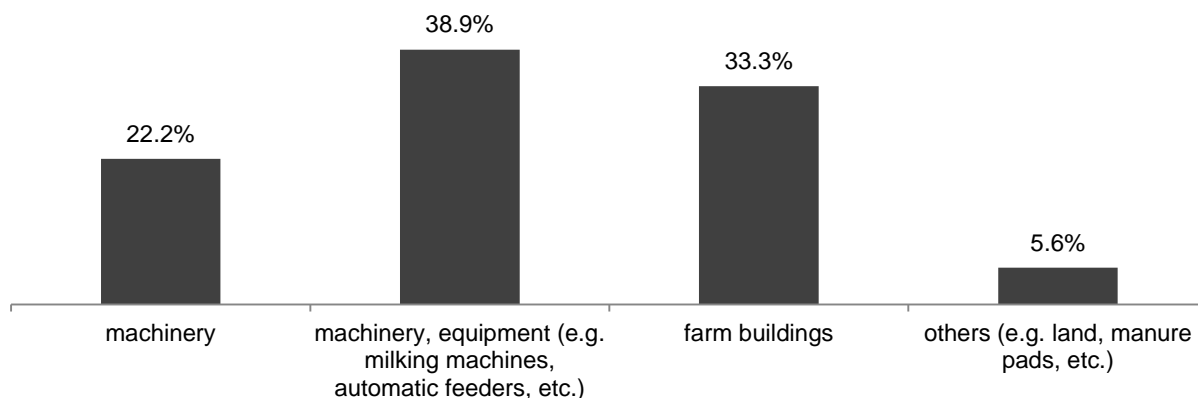
For an effective agricultural farm management, book-keeping is helpful as it facilitates recording information on what is history and what happens on farms, which provides the grounds for defining the objectives and tasks, methods and means of executing them, it is the condition for the right judgements, decisions, and effective farm management (Rozanska E., 2015). With the data acquired in the survey, only 43.3 % of the persons were book-keeping on their farm, with 29.9 % book-keeping on their own, and 6.7 % using the assistance of the specialist or friends (Fig. 3).



Source: author's calculations based on research

Fig. 3. Book-keeping

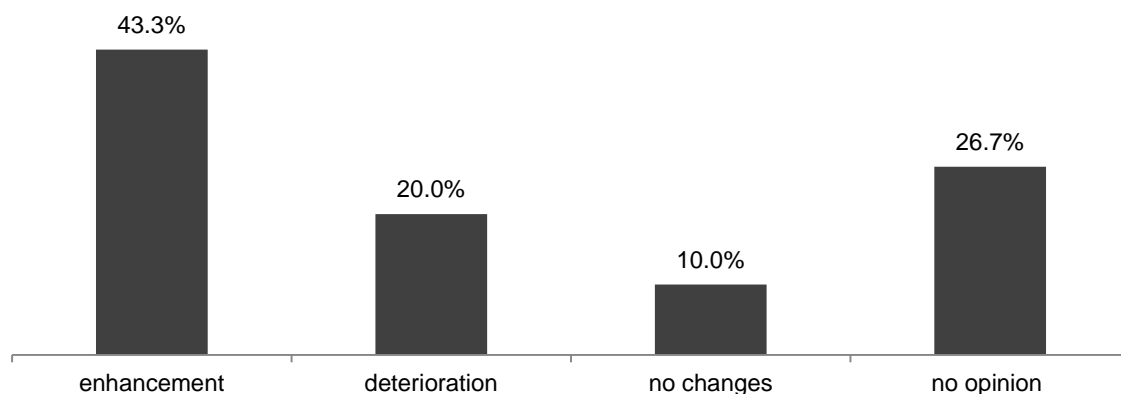
The research performed in the Zławies Wielka commune shows that over the last 4 years more than PLN 50000 has been invested in own farm; 43.3 % respondents. Most frequently the purchase of machinery and equipment (38.9 %) and the modernisation of farm buildings (33.3 %) were financed. Slightly less (22.2 %) was allocated to field works machinery, whereas 5.6 % – to the purchase of land and the construction of manure storage pads and surface hardening (Fig. 4).



Source: author's calculations based on research

Fig. 4. Investment projects completed over the last four years

Most of the respondents claimed that Poland's joining the European Union enhanced the situation of the farm (43.3 %), while 20.0 % claimed the opposite, and 26.7 % of the respondents did not express their opinion, and the lowest number of the respondents (10.0 %) claimed that joining the EU did not change the situation on the farm (Fig. 5).

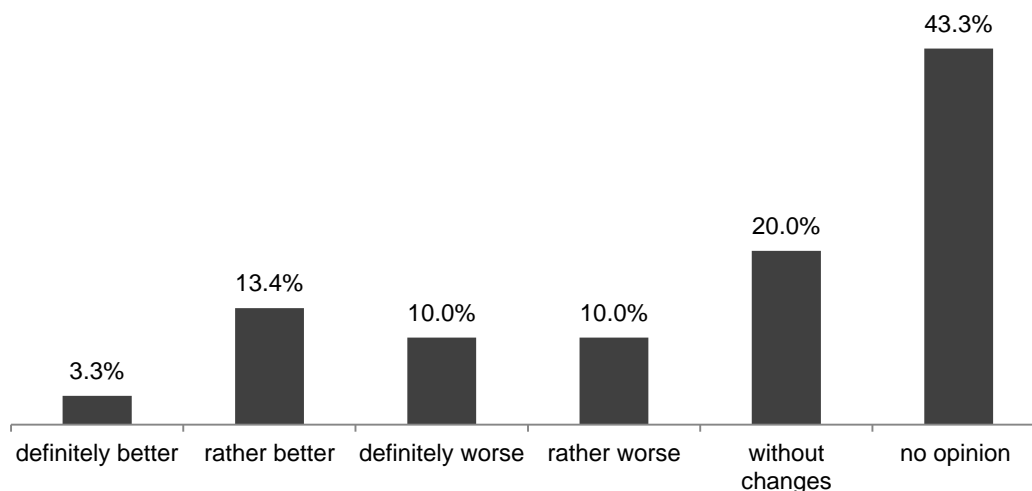


Source: author's calculations based on research

Fig. 5. Change in the farm's situation upon Poland's joining the European Union

In the countries of Central and Eastern Europe, already for a few years after joining the European Union the dynamic processes of structural changes are reported, including a decrease in the number of small agricultural farms. The tendencies are appreciated, however the fact is disregarded that some farms give up agricultural production officially only, and the arable land, especially in the regions with land fragmentation, is held by the units which still recently have been production entities, which can be due to Central and Eastern Europe-specific historic, cultural and institutional conditions and the economic calculation, including the land owners pursuing economic rents, including area payments (Satola L., et. al., 2018). Most of the respondents claimed that running a farm without assistance from the European Union would not be cost-effective (43.3 %). Another opinion was expressed by 26.7 % of the respondents, and 30.0 % did not express any opinion. Most of the respondents did not have any definite opinion on the prospective situation of their farm in 2 years (43.3 %); 20.0 % of the respondents claimed that the situation will deteriorate or it will remain unchanged. Only 16.7 % expected an improvement in the situation of their farm (Fig. 6). A long-time persistence of unfavourable costs-to-production relation on the farm for a long time triggers some concern as it can lead to progressive decapitalisation of the property and disregarding the remuneration for own work, which, sooner or later, poses a threat of the farm's economic failure.

The situation where, for a positive financial result, one must acquire external funds (subsidies, payments), is especially dangerous in terms of the EU Common Agricultural Policy changes planned. The payments and subsidies limitations planned can lead to a serious crisis in the sector as a considerable part of the entities will not be able to run their business in a way as to generate the production surplus over costs (Satola L., et. al., 2014).



Source: author's calculations based on research

Fig. 6. Forecast situation on the farm in 2 years

The analysis of the plans for their farms declared by the respondents were interesting. Most respondents (46.7 %) planned to hand over the farm to a family member (mostly children) in the future. Selling it was declared by 10.0 %, while more than 16.7 % wanted to keep on managing it, of which 5.0 % did not intend to make any changes in the acreage, whereas 11.7 % planned to increase the acreage. Every fourth person (26.6 %) did not have any precise farm management plans.

Conclusions

- 1) A vast majority of the respondents claimed that agricultural production was their key source of income. Some also combined it with being a hired labourer outside their own farm. Unfortunately, No interest in non-agricultural business activity was recorded.
- 2) As for benefiting from the CAP funds, direct payments prevailed. Other forms of assistance to agriculture were hardly indicated.
- 3) Almost half of the farmers surveyed were running their agricultural book-keeping, which facilitated a more effective farm management.
- 4) Almost half of the agricultural farm owners made substantial investments on their farms, trying to modernise both the farm buildings and the machinery.
- 5) Most farmers believed that Poland's joining the European Union enhanced the situation of their farm.
- 6) The farmers planned to hand over the farm or declared to keep on working further on the farm, which can suggest that the prospect of developing their farms and the agricultural sector in Poland is seen as positive.
- 7) Interestingly, due to the scope of research, the results cannot be generalised. The considerations provided in this paper concerning the results analysis only refer to a relatively inconsiderable, as compared to the entire community, group of farmers. For that reason the paper is a diagnosis,

which covers only a certain group of respondents, and the reader should not treat the results as representative for all the agricultural farm owners.

Bibliography

1. Bardaji, I., Iraizoz, B., & Rapun, M. (2009). The Effectiveness of the European Agricultural Quality Policy: a Price Analysis. *Spanish Journal of Agricultural Research*, 7(4), pp. 750-758.
2. Barnes, A. P., Hansson, H., Manevska-Tasevska, G., Shrestha, S. S., Thomson, S. G. (2015). The Influence of Diversification on Long-term Viability of the Agricultural Sector. *Land Use Policy*, 49, 404-412.
3. Benjamin, C. (1994). The Growing Importance of Diversification Activities for French Farm Households. *Journal of rural studies*, 10 (4), 331-342.
4. Borys, B., Slosarz, P. (2003). A Note on the Opinions of Farmers from Lowland Regions of Poland Concerning Factors Affecting the Operation of their Family Farms on the Threshold of Accession to the EU. In *Livestock Farming Systems in Central and Eastern Europe*. Wageningen Academic Publishers, Wageningen, pp. 215-221.
5. Edmond, H., Crabtree, J. R. (1994). Regional variation in Scottish pluriactivity: The Socio-economic Context for Different Types of Non-farming Activity. *Scottish Geographical Magazine*, 110 (2), 76-84.
6. Galluzzo, N. (2017). The Development of Agritourism in Romania and Role of Financial Subsidies Allocated under the Common Agricultural Policy. *Geographia Polonica*, 90(2), pp. 25-39.
7. Gazinski, B. (2016). Poland Recast. Agriculture and Rural Development during a Period of the Transformation and European Integration. An Overview. *Agrolife Scientific Journal*, 5(1), pp. 69-82.
8. Chrzanowska, M. (2017). Multidimensional Comparative Analysis of the Polish Agri-Food Sector in Regard to other EU Countries in the Years 2004-2014. *Proceedings of the International Conference „Economic Science for Rural Development”*, Jelgava, Latvia, No. 44, pp. 323-329.
9. *Gmina Zławies Wielka (Zławies Wielka Commune)* (2018). Retrieved: <https://www.powiattorunski.pl/8056,gm-zlawies-wielka>. Access: 19.04.2018.
10. Kalinowski, S. (2018). The Working Poor in the European Union. *Proceedings of the International Scientific Days 2018 „Towards Productive, Sustainable and Resilient Global Agriculture and Food Systems”*, Nitra, Slovak Republic, pp. 977-991.
11. Kielbasa, B., Grzelak, A. (2014). Assessment Of The Use Of The European Union Funds To Support Investments On Polish Farms In The Regional Perspective. *Acta Scientiarum Polonorum: Oeconomia*, 13(2), pp. 49-61.
12. Kisiel, R., Marks-Bielska, R. (2007). Polish Rural Areas and Agriculture in the Aspect of Globalization. *Proceedings of the 3rd International Scientific Conference on Rural Development*, Kaunas, Lithuania, pp. 62-66.
13. Marks-Bielska, R., Babuchowska, K., Nazarczuk, J. M. (2011). Polish Countryside and Agriculture on the Background of Global Changes. *Proceedings of the 5th International Scientific Conference on Rural Development - In Global Changes*, Kaunas, Lithuania, pp. 44-48.
14. Meert, H., Van Huylenbroeck, G., Vernimmen, T., Bourgeois, M., Van Hecke, E. (2005). Farm Household Survival Strategies and Diversification on Marginal Farms. *Journal of rural studies*, 21(1), 81-97.
15. Northcote, J., Alonso, A. D. (2011). Factors Underlying Farm Diversification: the Case of Western Australia's Olive Farmers. *Agriculture and Human Values*, 28(2), 237-246.
16. Nguyen, T. H. T., Tran, V. T., Bui, Q. T., Man, Q. H., de Vries Walter, T. (2016). Socio-economic Effects of Agricultural Land Conversion for Urban Development: Case Study of Hanoi, Vietnam. *Land Use Policy*, 54, 583-592.
17. Pacin, F., Oosterheld, M. (2014). In-farm Diversity Stabilizes Return on Capital in Argentine Agro-ecosystems. *Agricultural systems*, 124, 51-59.
18. Piecuch, J., Paluch, L. (2018). The Evolution of the Agricultural Sector in Central and East European Countries after 12 Years of Membership in the EU on the Example of Poland. *Proceedings of the International Conference „Economic Science for Rural Development”*, Jelgava, Latvia, No. 47, pp. 238-248.
19. Piore, A., Viaggi, D. (2015). The Spatial Dimension of Public Payments for Rural Development: Evidence on Allocation Practices, Impact Mechanisms, CMEF Indicators, and Scope for Improvement. *Ecological Indicators*, 59, pp. 1-5.
20. Potter, C., Tilzey, M. (2005). Agricultural Policy Discourses in the European Post-Fordist Transition: Neoliberalism, Neomercantilism and Multifunctionality. *Progress in Human Geography*, 29 (5), 581-600.
21. Począta, W., Pawlak, K., Czubak, W. (2012). Production and Income Situation in Polish Agriculture after Accession to the European Union. *Berichte über Landwirtschaft*, 90(1), pp. 133-158.
22. Reardon, T., Taylor, J. E., Stamoulis, K., Lanjouw, P., Balisacan, A. (2000). Effects of Non-farm Employment on Rural Income Inequality in Developing Countries: an Investment Perspective. *Journal of Agricultural Economics*, 51(2), pp. 266-288.
23. Roman, M., Nuszkiwicz, K. (2013). Changes in Agricultural Production in Poland after Accession to the European Union. *Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie. Problemy Rolnictwa Światowego*, 13(4), pp. 156-161.

24. Roman M., Roman M. (2018). The Similarity of the Structure of Foreign Trade in Dairy Products in the European Union. *Proceedings of the 27 International Scientific Conference Agrarian Perspectives XXVII. Food Safety – Food Security*, Czech University of Life Sciences, Prague, pp. 297-303.
25. Rozanska, E. (2015). Korzyści z prowadzenia rachunkowości w gospodarstwie rolnym (Benefits of Accounting on an Agricultural Holding). *Poradnik Gospodarski*, 01, pp. 26-27.
26. Santiago-Freijanes, J.J., Pisanelli, A., Rois-Díaz, M., Aldrey-Vázquez, J.A., Rigueiro-Rodríguez, A., Pantera, A., Vityi, A., Lojka, B., Ferreiro-Dominguez, N., Mosquera-Losada, M.R. (2018). Agroforestry Development in Europe: Policy Issues. *Land Use Policy*, 76, pp. 144-156.
27. Satola, L., Wojewodzic, T., Dacko, M. (2014). Do Divestments and Investments Determine Farm Development? *Bulgarian Journal of Agricultural Science*, 20(6), pp. 1281-1288.
28. Satola, L., Wojewodzic, T., Sroka, W. (2018). Barriers to Exit Encountered by Small Farms in Light of the Theory of New Institutional Economics. *Agricultural Economics*, 64(6), pp. 277-290.
29. Van de Poele, L. (2015). Rural Development from the Grassroots: Twenty Years of the EU „Leader Approach”. In *Constructing a New Framework for Rural Development*. Emerald Group Publishing Limited, Bingley, pp. 195-207.
30. Vlahos, G., Louloudis, L. (2011). Landscape and Agriculture under the Reformed Common Agricultural Policy in Greece: Constructing a typology of interventions. *Geografisk Tidsskrift-Danish Journal of Geography*, 111(2), pp. 131-147.
31. Weltin, M., Zasada, I., Franke, C., Pierr, A., Raggi, M., Viaggi, D. (2017). Analysing Behavioural Differences of Farm Households: An example of income diversification strategies based on European farm survey data. *Land use policy*, 62, 172-184.
32. Wojewodzic, T., Sroka, W., Plonka, A. (2017). Local Conditions of Production and Economic Disagrization of Farms. *Proceedings of the 8th International Scientific Conference Rural Development 2017: Bioeconomy Challenges*, Aleksandras Stulginskis University, pp. 1400-1404.

SPECIAL ECONOMIC ZONE AS INNOVATION BOOSTER IN LESS DEVELOPED REGIONS

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Abstract. Based on statistical data about financial indicators in the regions of Latvia, there can be observed a general finding that economic situation in the regions of Latvia is improving. But at the same time regional disparities between regions still remain. To decrease regional disparities, a variety of regional development instruments are used in Latvia. One of them is a special economic zone, which should be established in less developed regions. To operate in a special economic zone, companies should make investments in their business, primarily in fixed assets. The authors of research paper have discussed whether a special economic zone may be considered as an innovation booster in less developed regions. By using descriptive methods, the authors described economic situation in the regions of Latvia, defined main measure points of innovation level in regional aspect and analysed examples of innovative companies in special economic zones. The authors concluded, that if special economic zones play a role as innovation booster in less developed regions, than companies which operate in a special economic zone should primarily focus on investments in technology as innovation agent.

Key words: innovation; regional development; special economic zone, investment.

JEL code: O31; R11; F21.

Introduction

For the past years, statistic data shows that economic situation in the regions of Latvia is changing rapidly. Gross domestic product (hereafter – GDP) in statistical regions during the period of 15 years has grown more than four times on average. According to economic trends in the regions of Latvia, the gap in GDP per capita between the richest region (Riga) and less developed region (Latgale) has decreased, but at the same time Latvia remains the country with 9th highest regional disparities between regions (in the Organization for Economic Co-operation and Development countries (hereafter – OECD)) (Regions and Cities..., 2018).

Variety of regional development instruments are used in the regions of Latvia to improve their socio-economic situation and one of such instruments is establishment of special economic zones with an aim to attract investments and create new job places. A special economic zone can attract foreign and local investment, promote export-oriented growth and generate employment (Special economic zones..., 2018). Particularly special economic zones in Latvia (in total five) are established in less developed regions (two special economic zones are located in Latgale region) and in well-developed regions as Kurzeme and Riga, where two free ports and one special economic zone operate. This fact leads to assumption that a special economic zone can work as an agent of innovation booster especially in less developed regions.

The aim of the research paper is to examine whether a special economic zone can boost innovation in less developed regions. To achieve the aim, the following tasks were set:

- 1) to describe the economic situation in the regions of Latvia;
- 2) to define the measure points of innovation level in a regional aspect;
- 3) to analyse Latvia's experience in special economic zones as innovation booster in less developed regions.

The descriptive methods mainly (analysis and synthesis) were used in the research; the novelty of which is description of examples according to innovation intensive investment projects in special economic zones.

Research results and discussion

Heretofore the authors of the research paper start a discussion on the linkage between special economic zones and innovation, it is necessity to understand the background of economic situation in the regions of Latvia in the time period from 2000 to 2016. As shown in the Table 1, the GDP in Latvia during the period from 2000 to 2016 has increased 4.4 times.

Table 1

Gross domestic product in statistical regions of Latvia, in 2000-2016 (per one inhabitant, EUR)

No	Region of Latvia	2000.	2001.	2014.	2015.	2016.	Increase, times
1.	Riga* region	4849	5419	19739	20523	21078	4.3
2.	Pieriga region	2256	2431	9375	9830	10445	4.6
3.	Vidzeme region	1787	1980	7944	8050	8404	4.7
4.	Kurzeme region	2559	2822	8892	9035	9505	3.7
5.	Zemgale region	1826	1942	7518	7825	8046	4.4
6.	Latgale region	1424	1558	6183	6375	6516	4.6

*Riga region – as a region of the capital city.

Source: author's calculations based on the data of the Central Statistical Bureau of Latvia

Looking from the perspective of regions, the major increase in regional GDP is observed in Vidzeme region (4.7 times), followed by Pieriga region and Latgale region (each 4.6 times). Despite the rapid growth, GDP in Latgale region still lags behind other regions of Latvia. At the same time, specific regional development instruments such as special economic zones are available in Latgale region, which leads to the question – how special economic zones can boost innovations in less developed regions.

Regarding the above mentioned, the economists do not have consensus on the following contrasting suppositions:

- a) it is impossible to capture the benefits of innovation within GDP (Coyle D., 2017);
- b) economic growth can be slower when innovation accelerates, because of the fact that productivity depends also on the increase of physical and human capital (Gordon R.J., 2018);
- c) innovation is the key driving force behind regional economic growth, standards of living and international competitiveness (Acs Z.J, et al, 2002).

Responding to first supposition (a)), the authors have defined few measure points of innovation level in a regional aspect by using the statistical data available at the regional level. Authors claim that the main problem why it is impossible to capture benefits of innovation within GDP is a lack of statistical data and probably – composition of GDP should be reviewed with aim to capture economic growth from innovation. Regarding the second supposition (b)), it should be mentioned that economic growth can shrink due to the influence of innovation, e.g. resulting in a smaller number of job places needed to serve companies and business. Regarding the third supposition (c)), the European Central Bank claims that innovation can lead to higher productivity as the same input generates superior output in a business area – when productivity raises, more goods and services are produced (How does innovation..., 2017).

1. Measure points of innovation level in regional aspect

European Innovation Scoreboard 2018 (European Innovation Scoreboard..., 2018), which evaluates innovation development indicators in the European Union Member States and is adapted by the European Commission, measures performance of innovation systems by average performance

on 27 indicators such as human resources, attractive research systems, as well as innovation-friendly environment etc. European Innovation Scoreboard ranks Latvia among the group „Moderate innovator“. The group of Moderate Innovators includes those Member States where innovation performance is between 50 % and 90 % of the EU average – a Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Portugal, Slovakia, and Spain. The highest possible value of index is 100. According to the data of European Innovation Scoreboard 2018, the score of Latvia is 43.18 %. Latvia's overall performance tends to improve, ranking Latvia in 34th place (score for year 2017). Latvia has the strongest performance in „innovation-friendly environment“ and in „finance and support“ dimensions. Thus, „innovators“ and „firm investments“ are the weakest innovation dimensions.

There is a lack of regional level statistical data to evaluate innovation level in the regions of Latvia. The authors of this research paper consider that innovation level in the regions of Latvia can be observed by such groups of indicators as:

- human capital (population by age groups; level of education; number of educational institutions);
- financial indicators (economically active statistical units of the market sector per 1000 inhabitants, non-financial investments per one inhabitant, total sum of direct foreign investment per 1000 inhabitants).

The European Commission's 2014 Regional Innovation Scoreboard found that better circumstances for entrepreneurship and innovation are in those regions where inhabitants show more positive attitude towards new things and ideas. Such a statement leads to the fact that young people have more positive attitude towards new things and ideas. According to the data of the Regional development indicators module, the highest number of population in the analysed age group (from 15 to 61 years) is in Latgale region (62.8 % of total population, year 2018), followed by Zemgale and Vidzeme regions (each 62.5 % of total population in 2018).

Education level is one of the indicators which can describe human capital in the prism of innovation. The aggregated results of the Central Statistical Bureau (of Latvia) in 2011 on Population and Housing Census lead to the conclusion that people with a higher level of education are concentrated in densely populated areas. Accordingly, 62.4 % of the total population in Riga region are inhabitants with higher education, including doctor degree holders. Specific situation was demonstrated by Latgale region, where 40.9 % of the total population are inhabitants with vocational secondary education or vocational education. Education level in other regions of Latvia reveals more or less proportional distribution of education levels, including secondary education. Academic researchers and policymakers consider that education leads to growing numbers of innovation and that the number of innovation or inventors can be increased through educational policy (Does education lead..., 2013). The authors consider that in a region with lower level of education it would be more difficult to introduce and implement innovation than in the regions with population that have relevant higher education level. In such situation one of possible solutions could be to strengthen innovation capability within secondary education.

The Innovation Strategy of the OECD provides that education systems are essential for innovation by developing skills, promoting new ideas and technologies (Education and Skills, s.a.). It is most often assumed that higher education institutions are the main stage of education where understanding and innovation abilities of students (future inhabitants in giving age) are promoted; however, attention should also be paid to other levels of education. In 2018, there were 847 educational institutions in Riga region (from them 44 higher education institutions), followed by

Latgale region with 125 educational institutions (from them five were higher education institutions). Three higher education institutions were in Kurzeme region, two in Zemgale region, and only one in Vidzeme region.

Financial indicators. Component of GDP – „investment by spendings in business” indirectly can show the impact of innovation process, whether economic situation is improving. It should be taken into account that innovation is not as simple as spending more money in technologies. Innovation process includes reallocation of available resources and agile planning process. Researchers state that innovation and spending in research and development can enhance the growth of economy and can be a driver of sustainable development (Fernandez Fernandez Y., et.al, 2018).

The indicator which demonstrates non-financial investments per capita indirectly can show the impact of innovation as well. According to the data revealed in the Table 2, the lowest non-financial investments per capita are in Latgale region, while Riga region takes the lead by five times higher (year 2017) value of this indicator. Non-financial investments can include specific investments in innovations, thus the lowest rate in less developed regions should be stipulated with specific regional development instruments such as special economic zones.

Table 2

**Financial indicators in the regions of Latvia, in 2015 and 2017
(per capita, EUR)**

No	Region of Latvia	2015	2017	2015	2017	2015	2017
0.	Financial indicators	Economically active statistical units of the market sector per 1000 inhabitants, number		Non-financial investments per capita, EUR		Total sum of direct foreign investment per 1000 inhabitants, EUR	
1.	Riga region	91.98	93.42	3188.65	2974.89	1 880 567.76	1 452 781.19
3.	Vidzeme region	76.37	79.83	1096.54	1161.02	469 875.80	77 077.66
4.	Kurzeme region	67.97	73.86	1376.98	1118.88	485 785.92	480 803.52
5.	Zemgale region	61.52	63.33	1006.93	1128.64	173 110.70	164 272.16
6.	Latgale region	61.86	61.24	683.15	610.67	82 294.29	65 969.57

Source: author's calculations based on the data of Regional development indicators' module

The trend of non-financial investments and direct foreign investment shows that in a period of 2015 to 2017, these indicators decreased, which confirms the before mentioned supposition that economic growth can be slower when innovation accelerates. At the same time, the authors cannot confirm the assumption that the decrease of these financial indicators was caused by direct influence from innovation.

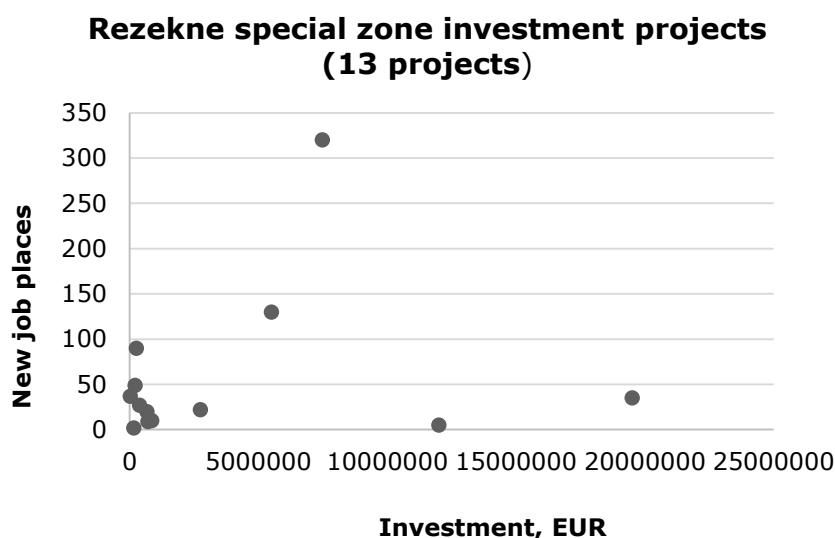
The indicator which increased during the period of 2015 to 2017, is the number of economically active statistical units of the market sector. According to the specific features of regional statistics, it is problematic to evaluate whether economically active statistical unit of market sector is innovative. The growth of this indicator gives evidence of higher competition in the market between different economically active statistical units, where is a possibility of innovation growth.

2. Latvia's experience in special economic zones as innovation booster in less developed regions

The European Parliament's Committee on Regional Development stresses that innovation can be most effectively addressed at regional level, where physical proximity can encourage partnerships between such actors as universities, research organizations, companies and regional, local authorities (Opinion of the..., 2011). This report points out that the most dynamic technology sectors are not

always present in or near urban municipalities, but close to the most innovative universities. The Committee on Regional Development calls all regions to invest in innovation and to adapt regional innovation strategies in order to increase their efficiency and as well to rejuvenate human capital and to increase the capacity of companies to innovate.

In case of Latvia, there are two special economic zones in less developed region (Latgale) - Latgale special economic zone and Rezekne special economic zone. The existing aid mechanism in special economic zones of Latvia does not focus on innovation, it primarily motivates investment intensive projects only in fixed assets, thus the innovation aspect in modern technologies usually is secondary.



Source: author's calculations based on the data of the Ministry of Environmental Protection and Regional Development

Fig. 1. **Linkage between amount of investment (EUR) per new workplaces created in Rezekne special economic zone**

As Figure 1 demonstrates, from 13 projects (shown as example without implementation year) the authors have highlighted two investment projects, where investment per one new workplace is noticeably higher than in other projects. The first project with investment amount of 12 000 000 EUR creates only five new workplaces (2 400 000 EUR of investment per one new workplace). The second project with investment amount of 19 513 100 EUR creates 35 new workplaces (557 517 EUR of investment per one new workplace). It can be considered that usually innovative investment projects have an impact on technologies, thus new workplaces which are created within the project are secondary. The authors agree on that, based on project examples from Rezekne special economic zone. In most of cases the companies which operate in special economic zone do not concentrate on innovation because the profile of these companies is woodworking, metal working, production of beverages, production of textiles etc. (Investors, s.a.). Such entrepreneurship profiles according to the data in Figure 1 make low investments per one new workplace –while another project with investment amount of only 27 000 EUR creates 37 new workplaces (730 EUR of investment per one new job place). At the same time, in the special economic zone also companies with such profile as production of fiberglass products operate and their manufacturing process in its turn demands to ensure research and development progress to increase productivity.

Examples of innovative investment projects in special economic zones of Latvia (in less developed regions). The authors observed few innovative projects among the applicants intending to acquire status of special economic zone. In 2018, the status of Rezekne special economic zone was assigned to the company „RSEZ SIA FLORAPLANET” that provides an electronic trading platform

for agricultural plant manufacturers. Such technologies demand high investment amount to ensure development of information technologies which are used in the company „RSEZ SIA FLORAPLANET“. The site or electronic trading platform is still in the process, but flowers and plants from many European suppliers are already available to Russian consumers.

The company „RSEZ SIA LEAX Rezekne“ ensures serial metal processing services as production of parts for automotive, mining and machine production industries. To satisfy the demand of the leading automotive customers, the company pays special attention to upgrading production processes. It can be implemented within cooperation in research and development area involving customers, higher education institutions, local municipality and special economic zones.

In Latgale special economic zone, the company SIA „LIGHT GUIDE OPTICS INTERNATIONAL“ operates, which is one of the world's largest optical fibre producers. Since y 2013, the company's research department has developed new products and production technologies, thus acquiring the world's most advanced industry technologies with high staff qualification.

Conclusions and proposals

- 1) Economic development trends in the regions of Latvia demonstrate that there is a possibility to boost innovations in less developed regions, which certifies the fact that better circumstances for innovation are available in the regions where inhabitants (young generation) have more positive attitude towards new things and ideas.
- 2) The existing aid mechanism in special economic zones of Latvia does not focus on innovation, it primarily motivates investment intensive projects only in fixed assets, thus the innovation aspect in modern technologies usually is secondary.
- 3) Since special economic zones play a role as innovation booster in less developed regions, those businesses that operate in a special economic zone should primarily focus on technology as innovation agent.
- 4) Most of companies which operate in a special economic zone do not concentrate on innovation because of their companies' profile (woodworking, metal working, production of beverages, production of textiles, etc.), which does not require specific solutions to increase productivity.
- 5) As a proposal, the authors suggest that the state aid in the form of decreased corporate income tax should be given within those investment projects, which increase innovation level in the company which operates in a special economic zone.

Bibliography

1. *European Innovation Scoreboard* (2018). Retrieved: https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en Access: 01.02.2019.
2. *Innovation Strategy* (2010). Retrieved: <https://www.oecd.org/site/innovationstrategy/> Access: 01.02.2019.
3. *Special Economic Zones: challenges and opportunities* (2018). Retrieved: <https://worldinvestmentforum.unctad.org/session/free-special-economic-zones-challenges-and-opportunities/> Access: 06.02.2019.
4. *How Does Innovation Lead To Growth?* (2017). Retrieved: <https://www.ecb.europa.eu/explainers/tell-me-more/html/growth.en.html> Access: 07.02.2019.
5. *Does Education Lead To More Innovation?* (2013). Retrieved: <https://voxeu.org/article/does-education-lead-more-innovation-0> Access: 07.02.2019.
6. Fernandez Fernández, Y., Fernandez Lopez, M.A., Olmedillas Blanco, B. (2018). Innovation For Sustainability: The Impact Of R&D Spending On CO2 Emissions. *Journal of Cleaner Production*, Volume 172, p.3459-3467.
7. Coyle, D. (2017). Rethinking GDP. *Finance & Development*, Volume 54, No.1, p. 16-19.
8. Gordon, R.J. (2018). Why Has Economic Growth Slowed When Innovation Appears To Be Accelerating? National Bureau of Economic Research, Working paper No. 24554.

9. Acs, Z.J., Groot, H.L.F., Nijkamp, P. (2002). Knowledge, Innovation and Regional Development. The Emergence of the Knowledge Economy, p. 1-14.
10. *Investors* (s.a.). Retrieved: <http://www.rsez.lv/index.php/en/about-us> Access: 14.02.2019.
11. *Education and Skills* (s.a.). Organization for Economic Co-operation and Development countries. Retrieved: <http://www.oecd.org/going-digital/topics/education-skills/> Access: 07.02.2019.
12. *Regions And Cities At a Glance 2018 – Latvia* (2018). Organization for Economic Co-operation and Development countries. Retrieved: <https://www.oecd.org/cfe/LATVIA-Regions-and-Cities-2018.pdf> Access: 07.02.2019.
13. *Opinion Of The Innovation Union – transforming Europe into a post-crisis world* (2011). Retrieved: http://www.europarl.europa.eu/meetdocs/2009_2014/documents/regi/ad/861/861338/861338lv.pdf Access: 12.02.2019.

TYPICAL WORK ENVIRONMENT RISKS, THEIR CAUSES AND REDUCTION MEASURES IN CONSTRUCTION

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Abstract. The aim of the paper is to identify the most typical and dangerous work environment risks in construction and their causes, put forward the proposals for risk reduction. Comparison and grouping methods for the analysis of statistic data, as well as methods and schemes for evaluating work environment risks were used in the research. Proposals for reducing the causes of the most typical and hazardous risks are presented in the paper. Specific solutions for each of hazardous risks and their causes are offered paying particular attention to the means of collective protection, as well as a model of corporate system is offered to regulate the procedures by which employees should be instructed and examined in order to improve the quality and control of labour protection instructions in construction for companies.

Key words: labour protection, risks, environment risk.

JEL code: R19, L89, F60.

Introduction

The construction sector is one of the largest economic sectors of Latvia and the European Union by number of employees and financial turnover. During the economic crisis, construction volumes of the sector fell significantly and a highly skilled workforce went in search of jobs outside the country's borders, which contributed to the lack of highly skilled professionals in Latvia. As construction volumes increased after the years of crisis, workers with lower qualifications and fewer working experience got involved in the construction market.

From the point of view of labour protection, construction is considered to be one of the most dangerous areas in national economy, which is characterised by large number of employees' accidents as well as occupational diseases more often than on average in Latvia. Construction is one of the sectors where completely all the risks of work environment can be identified, from them specifying the most typical and hazardous that result in serious and fatal accidents. This is related to the fact that construction works vary widely, works of different types are carried out at the same time by a large number of employees of different professions and with varied professional training level and the works should be performed in short periods of time and different weather conditions. All of this generally contributes to a high risk of the work environment in construction, accidents of varying degrees. However, the basis of everything is a lack of understanding of labour protection issues on the part of employers, as well as employees and contractors (Riga Stradins University, 2011). In order to avoid dangerous situations, the employees should be instructed and experienced, which contributes to their safety and the safety of their co-workers.

The complex of successful actions is based on a system, and labour protection system in construction companies is of great importance in creating safe and health-friendly work environment. In construction companies, labour protection system should be focused on close co-operation between employees and employers, searching for common solutions. The system is essential for development of a qualitative and effective performance of instruction in labour protection, for consolidation of employees' knowledge and practical skills.

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Accident statistics in the construction sector in Latvia

From the point of view of labour protection, construction is considered to be a rather dangerous sector, where each year there occur dozens of accidents and employees suffer lasting health problems, i.e. occupational diseases (Riga Stradins University, 2016).

According to the accident statistics of the State Labour Inspectorate, there has been a total of 12.446 accidents at work during the period 2009-2016, of which 1.086 in construction, i.e. an average of 8,7 % of the total (Table 1).

Table 1

Statistics on the number of accidents in construction sector in Latvia from 2009 until 2016

	2009	2010	2011	2012	2013	2014	2015	2016	Total
Accidents in work places									
Nationwide	1.203	1.232	1.397	1.545	1.748	1.763	1.712	1.846	12.446
Construction sector	120	102	138	174	157	149	122	124	1.086
%	10	8	10	11	9	8	7	6.7	8,7
From them: serious accidents in work places									
Nationwide	175	175	196	219	230	213	166	184	1.558
Construction sector	37	27	30	41	45	42	22	39	283
%	21	15	15	19	20	20	13	21	20,7
lethal accidents in work places									
Nationwide	32	25	34	35	31	41	41	38	277
Construction sector	7	5	10	11	3	5	2	5	48
%	22	20	29	31	10	12	5	13	17,3

Source: authors' construction based on the data of the State Labour Inspectorate

As a whole, the trend over the years shows that the number of accidents is declining, while 2016 data show that severe and fatal cases have increased compared to 2015. In general, this shows the trend of improving the attitudes of entrepreneurs and workers towards labour protection and the culture of workforce themselves from year to year.

The most common causes of serious and fatal accidents are non-compliance with safety regulations or instructions (27 %), unsatisfactory instruction and training of workers (14 %) and insufficient attention (12 %) (State Labour Inspectorate, 2015).

The most common work environment risks in construction

Typical work environment of construction sites has the following characteristic features:

- a constantly changing work place at different sites;
- a lot of heavy machinery and equipment;
- significant levels of noise, vibration, dust and various chemicals;
- high risk of transport accidents at sites (Riga Stradins University, 2016).

Statistic data show that accidents at construction work places in Latvia mostly occur due to lack of attention of employees and failure to comply with the specified labour protection requirements. A large part of identified occupational diseases have developed due to both poor and dangerous working conditions, failure to comply with elementary labour protection requirements and lack of caution. This is why it is important for employers, labour protection specialists and employees to be informed about the essential labour protection requirements, the most dangerous factors of work environment and possible labour protection measures when working in this sector (Riga Stradins University, 2016).

The safety and health of employees are the most important aspects from the point of view of labour protection, which should not be threatened due to the influence of different work environment risk factors. Of course, it should be noted that failure to comply with labour protection requirements can also cause financial loss to a company (equipment, raw materials, etc. can be damaged) and „third persons“ employees of other employers working at the site, passers-by or other people close to sites can suffer. Environmental contamination may also occur (for example, leakage of chemicals – paints, solvents etc.) (Riga Stradins University, 2016).

From the point of view of employees' safety and health, risk factors at construction sites may have a significant impact on the health of employees.

Essential aspect is the rapid pace of construction, which defines the continuous variability of a construction site. Technology changes quickly, subcontractors have different working methods, used equipment and chemicals etc., and, therefore, working conditions and risks employees are exposed to are variable. Lack of time and urgency during implementation of construction projects are an additional aspect which has a direct impact on the level of labour protection. Unfortunately, employers and contractors often believe that time and money can be saved at the expense of labour protection. For example, in order to reach a wall above 1,5 m or access the ceiling, one cannot do without sound scaffolding, so it needs to be raised, but railing is optional, because work can be done anyway. Similar thing happens when one does the roofer's job. Safety belt and safety ropes are uncomfortable so a worker cannot move fast and do the job as quickly as without these safety measures. In both cases ignoring of safety requirements essentially reduces work quality and increases the risk of accidents. Therefore, it should be remembered that, in case of an accident, costs will be higher than while respecting safety rules (Riga Stradins University, 2016).

Major factors leading to accidents occurring in construction:

- work at a height without protective fencing and inappropriate scaffolding, which creates a risk of falling, as well as work at a height on mobile ladders, and non-use of individual anti-fall protective equipment;
- drop of objects;
- snagging, stumbling in a disordered workplace etc.;
- electrical injuries, danger of explosion;
- various accidents involving the driving of heavy machinery (cranes, lorries etc.);
- work with work equipment and hazardous equipment (cranes, pulleys, lifts etc.);
- work in trenches without shoring (Riga Stradins University, 2016).

Work at a height is widely spread in a large number of sectors, particularly, in construction, building maintenance, energy and telecommunication, but employers, employees and even persons responsible for labour protection often underestimate the risks that may be the cause for falling from height. The accidents related to falling from height usually have serious consequences for employees' health and can cause their death. Therefore, it is necessary to timely plan the works where falls from height may be minimised by performing risk assessment and envisaging sufficient and adequate preventive measures (Riga Stradins University, 2011).

Falling from small height is dangerous because the fall time is very short – for falls from height up to 5 m it is less than or equal to the average response time (Riga Stradins University, 2011).

To prevent the danger of falling from height, one should use:

1) Collective labour protection equipment (for collective labour protection measures):

- preventing falls (railings, scaffolding, coverings etc.);

- receptive equipment (anti-fall networks, absorbing pillows etc.);

2) Individual protection equipment (anti-fall systems) (Riga Stradins University, 2011).

Work in trenches and foundation pits is very common in construction. While performing the works, basic labour protection requirements are not observed and accidents occurring have very serious consequences or end up with victim's death. Usually people are threatened by landslides from trenches without shoring or employees are hit by excavated land or other materials. Such risks are especially increased by heavy machinery working in the vicinity of trenches or other employees. In some cases, not reported in the project communication systems (gas pipeline, electricity cable) or explosive objects must be encountered. The risks related to getting in and out of a trench should also be mentioned (Riga Stradins University, 2016).

Noise in construction is a very common work environment risk factor. It is caused by a variety of work equipment (such as perforators, saws, mixers, angle grinding machines etc.) and heavy machinery. Starting each machine creates noise – a chaotic mix of sounds of different frequencies and varying intensity, which can significantly exceed the permissible (safe) level (Riga Stradins University, 2016). Noise exposure level within normal working hours must not exceed 87 dB(A) or a peak level 140 dB(A). If the noise exposure limit value is exceeded, labour protection measures should be taken immediately to reduce noise exposure level to the exposure limit value of 87 dB(A).

At work places where the noise level exceeds the lowest noise exposure action value 80 dB(A), the employer should provide:

1) Employees with individual hearing protection means;

2) Training and instruction for employees and trusted persons regarding the risk caused by noise paying particular attention to:

- the nature of risk caused by noise and risk for employees' hearing and other organ systems likely to occur due to noise;
- labour protection measures taken and to be taken to reduce or prevent the risk caused by noise and the conditions under which these measures are to be taken, specifying in particular the measures to be taken by employees themselves;
- the correct use of individual hearing protectors;
- the importance of hearing testing and signs of hearing damage, as well as reporting to the employer of hearing worsening;
- the conditions in which employees are entitled to health checks and the importance of these checks;
- safe working methods to reduce exposure to noise (Labour Protection Requirements..., 2003).

Vibration is a very common factor in work environment that should be encountered with operating of most equipment that causes not only noise but also vibration when working. Vibrations are usually based on poorly balanced rotational or directional components and the occurrence of vibration is determined by the operating principles of the equipment. Construction workers are often affected by arm and hand, as well as by whole body vibration. To arms and hands vibration is transmitted through employee's hands with work equipment the operation of which is based on strokes and rotation. Whole body vibration is transmitted through the supporting surfaces of a stationary or seated worker and affects the whole body (Riga Stradins University, 2016).

Chemicals and dust are a daily phenomenon in construction that arises from both the fuel used and from the construction materials.

Essential risk factor in construction is dust which can occur in the process of performing almost all construction works. Abrasive dust and abrasive particles (derived from grinding), lime and chalk dust, silicate dust, wood, concrete and cement dust (silica dust) are most widespread in construction. Glass and stone waddings are often used in construction. Some dust is held off by the hair of the nose, a portion of the passage lands in the wet mucosa, and other dust particles are held in the throat and laryngeal membranes. The lining of the nose not only stops, but thanks to the bactericidal properties, also kills bacteria. The most harmful are microscopic dust, particularly particles of 0,5-2,5 mm size, which is capable of entering deep airways, even alveolus, which causes acute inflammation, which can then pass into chronic inflammation. Asbestos containing dust is especially harmful, asbestos fibres are a proven occupational carcinogen (Riga Stradins University, 2016).

The most common problems in construction are the misuse of different chemicals (construction materials or different consumables) and the lack of awareness of the hazards of workers, as well as the storage of these substances in unsuitable and unlabelled containers. Very often workers are not provided with correct and appropriate individual protective equipment, such as gloves and respiratory protective devices (Riga Stradins University, 2016).

Handling weights, forced posture, frequent and repetitive movements are ergonomic risk factors. It should be noted that „weight“ is a notional size, whether the object is heavy, depends on the individual characteristics of the employee. Forced postures, body or its parts being in a long-term constant state. Forced postures can be very different — sitting, standing, walking, lying, squatting, bending and stretching. Depending on their type, forced posture can affect the neck and shoulder band, elbows and hands, back, hips or legs. In construction, the most frequent forced postures are associated with long-term tufting on the knees (e.g. flaps, roofers) or long-term sitting (Riga Stradins University, 2016).

Construction may involve frequent and repeated movements in many working processes; particularly harmful if requires an expressed physical effort of more than 50 % of working time, such as grinding, plastering, painting and other interior works (Riga Stradins University, 2016).

Options for reducing the causes of trenching risks

The analysis of accident statistics, more specifically, the number of fatal accidents, revealed that trenches are among the most dangerous in terms of the number of fatal accidents. The risk assessment for a particular situation identified the most dangerous risks of strengthening trench walls as well as getting in, getting out and moving along the trench. Also a major risk is an unordered and unplanned construction site, which creates a chaotic interaction between workers and heavy machinery moving around the construction site.

To reduce risks before starting work, it is necessary to correctly understand the task of the work to be carried out in order to ensure full protection against accidents, and it is therefore important to attract the competent persons and bodies to assess, draw up and give an opinion on:

- the soil composition;
- preparing a labour protection plan for a specific object (designing PPE and CPE);
- the absence of engineering communications in the work area or a plan to protect engineering communications;
- a work project accepting the interaction between construction machinery and workers on the construction site, with a particular focus on correctly strengthening the walls of trenches, building pits;

- high-quality instructions for a specific object with the specific nature of its work.

It is prohibited to dig holes and trenches without additional corroboration if they exceed the following depths:

- in sand ground – more than 1 metre;
- in moor sand ground – more than 1,25 metres;
- more than 1,5 metres in sandy and clay soil;
- on hard ground, when crowbars and hacks are used – more than 2 metres (Riga Stradins University, 2010).

Building pits and trenches must be constructed with slanted walls without corroboration or with vertical walls, securing them throughout the height. The walls must also be strengthened if there is a risk of collapse of the edges.

In order to get in and out of the trench, it is necessary to use tested ladders which need to be stabilised, so that there is No risk of falling down during climbing and creating an accident risk. If there is less place in the trench, the portable ladders should be selected, but the ladders should preferably be placed on a stable surface, with the possibility of fixing them preventing the possibility of movement, as well as the length of the stairs must extend sufficiently across the edge of the trench to allow workers escape the trench freely.

During trenching and digging works, workers are at risk of injury from construction equipment located on the site, it is therefore important to plan correctly the work of the machinery and workers on the construction site.

If technical works are carried out adjacent to an unfixed trench and the edges of the slopes, the minimum technical distances should be observed. If these distances cannot be observed, the trench edges must be fixed. Movement roads must be wide enough for construction machinery and workers without obstacles, if possible, separated and enclosed. Workers must move around a construction object with reflecting vests.

Options for reducing the causes of working at heights and on a rooftop risks

Working at height on the roof is one of the most dangerous types of work in construction, what is also reflected by statistics on fatal accidents. Similarly to works in trenches, the most significant risk of working on the roof is the absence of collective protective equipment or disassembly. In terms of collective protection means, it is most commonly observed that there is No guarantee of the roof perimeter from falls in case when the worker has not been provided with individual protection means or has committed a mistake through negligence. Collective means of labour protection protect not only workers but also third parties from objects which may fall from the roof.

Before starting construction work on a roof, careful planning and risk assessment would be necessary. The specific nature of the roof works differs, as the height and roofing of houses vary greatly, as well as the changing weather conditions in Latvia have a significant impact. A construction permit should not be received for the replacement of roofing, which means that if the roof structure is not involved in the works, only a proof card is required for replacing the roofing (Building Regulations, 2014).

The most significant risk in the roof works is falling from great height, so collective means of protection should always be provided along the perimeter of the building. The perimeter of the building must be provided with scaffolding in the direction of the slope. It is important to supplement

the roof scaffolding with a covered sieve which prevents the fall of various objects from the roof in case of strong breeze or a worker's inattentive dropping.

When assembling scaffolding, it is important that:

- the work is carried out by a certified assembler who is familiar with and observes the assembly schemes and solutions of the scaffolding manufacturer. Before the work is carried out, a scaffolding assembly plan is prepared;
- the scaffolding shall be placed on the stable surface so that it does not lose its resilience;
- scaffolding shall be equipped with all necessary safety elements.

In practice, there are cases when scaffolding cannot be placed on the street, in such case one of the solutions for collective protection is to place scaffolding on consoles under the ledge of the building. It is necessary to carry out additional research and resilience to the building's enclosing structure, since the consoles are based on penetrating anchorages in the building's wall structure.

There are situations where it is possible to place the scaffolds only along the part of the building's ledge and the walls of the end are attached to other houses, which makes it impossible to install the scaffolding. In these parts, as well as parts where there is no active operation but movements of workers are possible, it is necessary to install a railing system that is easy to mount and dismantle and also serves as a stable protection. Railings of this type must also be placed around openings in coverings.

In addition to those collective protection means, in order to ensure additional safety, there are anti-fall protective networks which provide additional protection, if one of the above-mentioned means has not worked. Such a solution is not particularly popular in Latvia. Nets may be used under covering openings for different areas where it is possible to fall to a lower level.

A typical risk is the fall of unattached instruments from great height. To reduce this risk, it is recommended not to keep the materials on the roof which can easily change their location, and workers should choose different modern solutions so that the instruments falling out of hand are provided with an anti-falling mechanism.

Working on the roof mostly involves a complicated working area and uncomfortable working poses. To minimize these risks, a variety of mechanisms, such as wooden, aluminium or scaffolding type ladders, can be used that allow to stay in one of the work areas without additional effort. The ladders are usually hooked by the ridge and they can be selected by the required length.

The proposed collective protection solutions contribute significantly to the prevention of fatal accidents, as well as reduce the risks to third parties, while the safety of the workers themselves should certainly provide for personal protective equipment. There are many and different methods of roof coverings, for example, flat roofs are often encased by a method of melting where open fire is used. Metal works use a method of soldering, the surface is purified mechanically or chemically and, respectively, chemical vapours appear, followed by soldering. In order to reduce risks to health and the potential development of an occupational disease, it would be necessary to apply all the necessary personal protective means to the specific nature of the work:

- a chin-strap helmet that ensures that the helmet is not dropped while bending one's head;
- protective footwear S3 with toe protection, the upper part shall ensure that moisture does not penetrate, oil and petrol resistant, anti-static and non-slip soles;
- protective clothing securing against mechanical fittings and appropriate to climate conditions and allowing easy movement;
- protective goggles against mechanical shocks;

- respirators appropriate for the specific nature of the work;
- hearing aids, easy to use and used, as appropriate, when noise is above 80 dB(A);
- gloves against mechanical resistance, tailored to the specific nature of the work and the climate conditions of the moment;
- fall prevention systems (restricting systems, job positioning systems) and fall stop systems.

The reports of the State Labour Inspectorate and practice often show that major infringements relate to disassembly and operation of scaffolding. Before the scaffolding is installed, it is important to prepare the ground, the base where it will be placed. It is important to ensure that the ground is sufficiently stable and does not lead to decay. It is important:

- to test the stability of the ground;
- to seal the bottom or to build a stable base;
- to make sure that works are not carried out in the immediate vicinity, which could create particular risks for the loss of stability of scaffolding;
- to make sure that rain water will not lead to ground erosion;
- use base plates in the case of flat base to prevent slipping;
- scaffolding must not be based on hollow building materials or bending wood parts (Legally Non-Binding Guidance..., 2008).

It is mandatory for the assembler to verify their condition before assembling the elements, to replace the damaged parts with the corresponding undamaged ones. For scaffolding in the vicinity of air lines, electrical installations and scaffolding on the roof of high-rises, grounding is recommended. Scaffolding base must be located on a secure base.

Prior to the assembly of scaffolding, the responsible specialist must draw up plans for the assembly, dismantling and use of scaffolding (scaffolding plan), which must include information on the overview and side-view of the structure of the scaffolding, the location of the scaffolding structure at the site (at the building or other site), the dimensions of the scaffolding structure (length, width, height, area placements, diagonal placements, anchorage points and mountings) and restrictions on use. The scaffolding must be assembled, operated, dismantled and maintained in accordance with the requirements of the manufacturer and lessor, the instructions for use, the technical documentation and the scaffolding plan. Scaffolding must be mounted in full assembly (Labour Protection Requirements..., 2014).

Improvements in performing instructions for reducing the causes of risks

Analysing the causes of accidents in the construction sector, it can be concluded that the causes of accidents involving poor performance or lack of quality of labour protection instructions (lack of compliance with safety regulations or instructions, unsatisfactory instructing and training of workers, use of unacceptable or inappropriate working methods, insufficient attention) are 64,6 %.

In the second half of 2018 the authors had made a survey among employees of more than 10 construction companies in Latvia in the field of labour protection. Survey results showed that 66 % of those surveyed received the full instruction. 11,4 % are not instructed at all when job duties change. 25,7 % do not receive new instructions, and most mention that the instructions are received in the work area or in the dressing room.

These statistical indicators clearly show that there is need for improvements and arrangements in the conduct of instructions. The success of this process requires a system governing the procedures in which employees should be instructed and their knowledge checked.

In spite of the implementation of the system, important nuances should be highlighted, which would encourage labour protection instructions to be of better quality and make employees understand them better:

- instructions must be simple and specific without complex words and legislative points;
- instructions must be carried out in rooms intended for them, not at the workplace or in the dressing room;
- the employees must be paid for the time spent on instructions;
- in relation to the fact that a large proportion of employees in Latvia do not understand the Latvian language and are from other countries, it is desirable to perform the instructions in a number of languages, in Latvian and in a language that is understood by the employee;
- the use of easily perceived images, infographic images;
- instructions must be short;
- let the instructed ask questions, if any.

Conclusions, proposals, recommendations

In carrying out the assessment of the risks of work environment in the field of construction in Latvia, the authors of the work concluded the following.

- 1) Construction workers are exposed to many and different combinations of risks to the working environment, since very often a number of risks to the working environment are simultaneously exposed and are able to reinforce each other's effects, such as concreting, bricklaying, finishing works etc. The short time limits for carrying out works contribute to this.
- 2) Accident statistical data indicate that accidents take place in case of a lack of attention of employees and failure to comply with the specified labour protection requirements. These accidents are based on poor instruction and monitoring of the labour protection plan, as well as lack of time and costs that contribute to stress, leading to errors of negligence and forgetfulness. The result is an accident.
- 3) The most important risk factors for the working environment in construction are: mechanical and traumatism factors, physical factors, chemicals, dust, ergonomic factors, psychosocial factors and biological factors. The main factors leading to accidents include working at a height without collective and personal protective means, falling objects, stumbling (tripping), electrical injuries, collisions with heavy machinery, working with hazardous equipment, working in unforced trenches.
- 4) Due to resource and time saving, instructions are carried out even in workplaces or dressing rooms, which prevents workers from concentrating and correct perception of instructions. There is No practical demonstration or No verification of the information that has been heard to determine whether the worker has received and understood the information of instruction.

During the project execution stage, monitoring and control of labour protection requirements, including collective and personal protection requirements, should be ensured on the construction site, as well as making sure that all employees in the construction facility are instructed, trained and familiar with the labour protection requirements. It is recommended that the following measures should be taken at the project execution stage.

- 1) In order to successfully operate a construction company in the field of job protection, the company needs an internal system of labour protection. The system does not need to be international or recognised by any special standards, which requires high costs.

- 2) After performing instructions, it is necessary to control the acquired knowledge; the control could be in the form of interactive tests. In order to improve the culture of labour protection on the part of employees, it would be important for the company to create a motivational system for employees. For example, the best employee of the month, who has not violated labour protection requirements or otherwise provided valuable information about problems at the construction site, should be rewarded with paid holidays or sponsored entertainment beyond working hours.
- 3) To place informative, easily perceivable booklets in the areas of construction sites where active operations are taking place with the most important information regarding the works to be performed. Placed at arm's length, information would serve as an additional means of reducing risks and would not require major investments.
- 4) To improve the content and presentation of instructions, short briefings should be supplemented with easily perceived practical examples, such as how to properly handle an angle grinder or use a respirator. It is advisable to use images or create instructions in the form of infographics. Instructions should be topical and adapted to the needs of employees. After conducting instructions, it is necessary to check the knowledge of the instructed, for example by means of a test.

Bibliography

1. *Building Regulations* (2014). Republic of Latvia Cabinet Regulation No.529, Adopted 2 September 2014.
2. *Labour Protection Requirements for Protection of Employees from the Risk Caused by the Noise of the Work Environment* (2003). Republic of Latvia Cabinet Regulation No.66. Adopted 4 February 2003.
3. *Labour Protection Requirements Working at a Height* (2014). Republic of Latvia Cabinet Regulation No.143, Adopted 18 March 2014.
4. *Legally Non-Binding Guidance on Best Practices in the Implementation of Directive 2001/45/EK (Working at Height)* (2008). Office for Official Publications of the European Communities, Luxembourg. 82 p.
5. Riga Stradins University (2010). *Labour Protection Requirements for Road Construction*. Riga: Riga Stradins University Institute for Occupational safety and environmental health. 16 p.
6. Riga Stradins University (2011). *Labour Protection Requirements for Working at Height*. Riga: Riga Stradins University Institute for Occupational safety and environmental health. 18 p.
7. Riga Stradins University (2016). *Work Environment Risks in Construction*. Riga: Riga Stradins University Institute for Occupational safety and environmental health. 18 p.
8. State Labour Inspectorate (2015). *Report to the National Labour Organisation on the Results of the 2014 Performance of the State Labour Inspectorate*. Riga, 18 p.

EXPENDITURE ON INNOVATIONS OF SMES AND SOURCES OF THEIR FINANCING IN POLAND AS ILLUSTRATED BY THE EXAMPLE OF MALOPOLSKIE VOIVODESHIP

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Abstract. Due to increasing globalization, innovations have become a basic method utilized by enterprises to gain competitive advantage and improve the efficiency of operations. Their introduction is a prerequisite for the growth of any business, however, in the case of the sector of small- and medium-sized entrepreneurs, the implementation of new solutions is their way to survive. The purpose of this paper is to analyse and evaluate the expenditure made towards innovative activities of SMEs in Poland in 2012–2016. Data published by GUS (Statistics Poland) and Eurostat on innovative activities of SMEs in Poland have been used, with a special focus on the Małopolskie Voivodeship.

Key words: sector of small- and medium-sized enterprises, R&D expenditure, innovations, sources of funding.

JEL code: 032, 039, 056.

Introduction

Due to Poland's accession to the European Union, the increasing globalization and scientific and technical progress, innovativeness of enterprises has become a matter of particular importance. It should continue to steadily increase as innovations are recognized as an opportunity to meet challenges made by consumers. For that reason, research interest in innovations has not decreased as evidenced by numerous papers published in the literature. The above is reflected in the basic importance of innovativeness to the development and achievement of competitive advantage and the improved standard of living of society. The research on innovativeness requires constant activity of economic entities which not only must observe and analyse changes in their environment but must also be prepared to embrace them and become their inspirers. All such activities allow to adapt to the ever-changing environment, respond to its needs and create changes which, in turn, enables them to create their competitive advantage. Currently, innovations are major factors determining a country's social and economic development and a driving force of the entire economy. That is why efforts to introduce innovations can be seen in all branches of the economy. Innovations have undoubtedly become both the sign and the requirement of the modern-day civilization progress.

The strategic and multidimensional nature of innovations stems from their variability and a growing pace of such changes, dynamism and connection of the enterprise and its future, the mutual synergic pervasion and, finally, their economic effectiveness. The intensification of innovative decisions is the product of many variables. Innovative decisions are one of basic sources of gaining a competitive advantage by enterprises, especially SMEs which, to grow, need innovations such as new products or services, new technologies, organization systems and new markets.

The purpose of the paper is to assess the condition of the investment expenditure on innovations at small- and medium-sized enterprises in Poland with a special focus on the Małopolskie Voivodeship. This paper relies on secondary data published in GUS Statistical Yearbooks and Eurostat data. Based thereon the dynamics of changes in 2012-2016 has been presented, including both industrial and service enterprises.

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1. Innovativeness as an opportunity for competitiveness of entrepreneurs

The basic purpose for which innovations have been implemented by enterprises, especially SMEs, is the pursuit of the competitive advantage on the market. The process of constant improvements in the area of the management of enterprises indicates a broad range of activities that are required to be implemented to gain such level of competitiveness that allows a company to gain a strong market position (W. M. Grudzewski, I. K. Hejduk). The above, however, requires the application of various concepts, methods or techniques of the organization and management of an enterprise (D. Zuzek. L. Paluch 2016; D. K. Zuzek, I. Wielewska 2017; I. Wielewska 2017).

From the economic perspective, the most important business innovations should be those innovations that are of strategic importance, ensuring stable development in the long run. Thus, access to IT infrastructure, the quality of labour force (education, mobility) and technical and technological development should be regarded as vital aspects. That is why scientific and innovative policy plays a very important role in the enterprises' impact on social and economic growth.

In order to operate on the European Union market, SMEs face high demands as regards the introduction of innovations. Adapting to the ever-changing customer expectations and fast-paced technical and technological progress are key to attain a significant market position and can be possible through the intensification of innovations leading to their improved effectiveness and competitiveness. SMEs attach special importance to attaining best performance levels by sourcing properly qualified staff, proper co-operation with the immediate and external surroundings, and implementing effective production methods responding to market needs. Such factors may build the image of innovative enterprises and at the same time be their strengths of their operations on a global market.

The innovativeness of enterprises depends on a number of factors determining its scope and level and the following may be regarded as major innovation and competitiveness factors (J. Pawlowski 2005):

- the capacity to invent, create and engage in innovations;
- the capacity to absorb innovations;
- the structural capacity to strengthen a competitive position, namely, the potential to increase a market share related to technical and organizational infrastructure;
- competences of the development of product innovativeness and assortment based on technical and technological as well as financial potential;
- the innovation capacity of the technical and technological potential being the degree of attractiveness and innovativeness of technical and technological means;
- the capacity to finance innovative activities and activities fostering competitiveness on the market.

Modern small- and medium-sized enterprises should be innovative and one should remember that a business can be regarded as innovative if (A. Jasinski 2005):

- it has been engaged in a wide range of R&D works or has been relying on the results of such works performed externally;
- it has spent relatively large expenditure on innovations;
- it has been regularly implementing new scientific and technical solutions;
- the proportion of innovations in production or services is high;
- it has been regularly creating and introducing innovations into production, work organization and the market.

However, attention should be had to the fact that frequently innovative activities of SMEs are not based on developing new products or technologies as in the case of large companies. Due to financial limits, they are not engaged in their own large-scale research. Their innovations are strictly related to market needs and the needs of their potential customers and users, and involve popularization of new product and technological solutions created by large entities and research institutions in that way fuelling faster economic growth.

2. Expenditure on innovations at SMEs

Polish SMEs have been more and more innovative and have been actively engaged in R&D works and increasingly interested in partnerships. The above is also applicable to the growing tendency among entrepreneurs to take risk being an inseparable part of innovations. Entrepreneurs see benefits that stem from innovations and have been more and more active in that field, although there is still much room for improvement as regards the sphere of R&D and innovations.

Research and development expenditure to GDP is regarded as one of key measures of the economy's innovativeness and technological progress. In Poland the growth rate of R&D expenditure is usually higher than the GDP growth rate, however, it is still insufficient (Table 1).

Table 1

GDP and R&D expenditure growth rates in Poland in 2012-2016*

Indicator	2012	2013	2014	2015	2016
GDP growth rate	101.6	101.4	103.3	103.9	103.3
R&D expenditures	122.8	100.5	112.1	111.7	95.28

*Previous year = 100

Source: 2012-2016 data by GUS, Warsaw

The above is also confirmed by data pertaining to EU member states. Poland's rate (approx. 1 % GDP) is clearly below the average EU rate (2.03 %). On the other hand, the steadily growing R&D expenditure of SMEs is promising. In 2016 the sector invested, in nominal terms, an amount which was more than four times larger vis-à-vis 2010 and its share in total R&D expenditure amounted to 65.7 % (in 2010 – 26.6 %). Compared to other EU member states, BERD being the percentage of GDP was higher in Poland than in Portugal, Slovakia and Latvia (BERD in Latvia was the lowest) (Przedsiębiorczość w Polsce /Entrepreneurship in Poland, 2018).

In 2018, Poland ranked 25th in the European Innovation Scoreboard among the so-called moderate innovators. The strengths of the innovation-friendly environment as per the ranking included broadband penetration and entrepreneurship whereas innovators and attractive research systems were the weakest innovation dimensions (<https://polska.pl/economy/investments-projects/poland-climbs-39th-position-global-innovation-index/>). On the other hand, in the 2018 Global Innovation Index¹ report Poland ranked 39 out of 126 countries, right behind Bulgaria, Slovakia and Latvia, with Switzerland, Holland and Sweden as the ranking's leaders (<https://polska.pl/economy/investments-projects/poland-climbs-39th-position-global-innovation-index/>).

A growing number of entrepreneurs have been engaged in innovations and the share of innovative enterprises in industry has been steadily increasing since 2012. Current data pertaining to innovations by enterprises in 2014-2016 show that the share of innovative businesses stood at 18.7 % in industry (the increase by 1.1 percentage point y-on-y) and 13.6 % in services (the increase

by 3.8 percentage points y-on-y). Increases were also seen among innovation active enterprises. In 2014-2016 industrial and service innovation active enterprise accounted for 20.3 % and 14.5 % of a total number of such entities, respectively (vis-a-vis 18.9 % and 10.6 % in 2013-2015, respectively) (Przedsiębiorczość w Polsce, 2018).

The level of innovativeness of enterprises mostly depends on the choice and structure of tools and instruments of the innovation policy. Changes made by entrepreneurs allow to identify vital components of the model of an innovation process with the integration of varied and extensive market relations and flexible adaptation to market requirements and possibilities of organization by the process of continuous innovation being its indispensable elements, i.e. regular product and service modification. Major reasons why the Polish innovation policy was poorly rated include (Warunki zdynamizowania innowacji w polskich przedsiębiorstwach.....):

- an incompatible government strategy as regards the development of technical and technological solutions or industrial policy,
- taking basic decisions regarding the directions of the industry development which do not always account for the goals of the entire economy,
- insufficient financial R&D expenditure,
- poor co-operation between Polish scientific and research units and industrial enterprises with research centers and foreign industrial enterprises,
- inaccurate and unstable legislation.

Ineffective domestic innovation policy is the result of the weakness of individual segments of the domestic innovation system and little connection between them (the size and structure of innovation expenditure, a tax policy, an intellectual property protection system, a competition policy, a system of legal norms). Institutions supporting those activities and creating legal and institutional solutions should develop a new culture incorporating values and attitudes such as entrepreneurship, creativity, expertise, activity, professionalism, the involvement in activities of organizations, the acquisition of new qualifications and skills with the use of new technologies. A major barrier includes low financial outlays on innovations which, during the final period of transformation, practically continue to be invariably low (relative to GDP). Moreover, an important disadvantage of the subject structure of R&D works carried out in Poland is a relatively high share of basic research vis-a-vis applied research and development works. That results in little chance of joint research by entrepreneurs and higher education units focused on basic research. Poland lacks sufficient concentration of investment outlays (on a small scale) on selected fields of knowledge and technology which leads to their dispersion in various areas, resulting in, in turn, failure to create an expected synergy effect, unlike in, for example, Finland or Ireland (Wisniewska, J., Janasz K., 2018).

Innovations among enterprises mean engaging in different types of activities facilitating their implementation and incurring the related expenditure. For years Poland has had a low proportion of innovative enterprises, both in the industrial and service sectors. Over the past few years it did not increase significantly in industry, and in the service sector, after a few years of decline, No increase was recorded until 2016 (table no. 2). Even though the data shows that the share of innovative enterprises has been increasing gradually, it still remains unsatisfactory.

Table 2

Innovative enterprises in Poland in 2012-2016 [in %]

Innovative enterprises	Innovation types	Years				
		2012	2013	2014	2015	2016
Industry	Overall	16.51	17.13	17.52	17.58	18.7
Services		12.38	11.41	11.41	9.79	13.6
Industry	Product	11.19	11.01	11.72	11.77	12.4
Services		7.05	5.81	6.78	4.82	6.9
Industry	Process	12.44	12.82	12.95	13.03	15.2
Services		9.11	8.50	8.39	7.39	10.4

Sources: Data by GUS 2012-2016, Warsaw

Based on the analysis of the data in the table, although the percentage of innovative enterprises in industry went up by 13.3 % in total over the entire period under analysis (the highest increase was recorded in 2016), in the case of enterprises engaged in rendering services, until 2015 basically a downward trend had been observed (a decline by as much as 21 %) which continued until 2016.

Over the past few years a change in the structure of expenses related to innovations was visible, both in regard of Poland and the Malopolskie Voivodeship. In 2007 the vast majority of expenses of enterprises engaged in industrial processing was spent on investments – on average industrial enterprises spent 85 % of funds on investments and in the Malopolska Voivodeship the average investment expenditure totaled 79 %. Such structure of expenditure is characteristic of regions which are less developed in terms of innovations.

2016 witnessed a change of the structure of expenditure both in Poland and especially in the Malopolska region. The share of expenditure on investments in tangibles in total innovation expenditure of industrial processing enterprises diminished (Poland - 77 %; Malopolska - 68 %), while the share of R&D expenditure rose (up to 18.5 % and 31 %, respectively). The above may prove that the investments of industrial enterprises in tangibles rose which led to the shift in the structure of expenditure. Such direction of changes may be the effect of the domestic and regional policy of supporting innovations of enterprises financed mostly with European Funds until 2020 focusing on R&D works. The above is particularly noticeable in the case of the following voivodeships: Lubelskie, Podkarpackie and Świętokrzyskie (covered by the Eastern Poland Program 2014-2020), which, compared to other voivodeships, stand out thanks to the relatively higher share of R&D expenditure (Aktualizacja pogłębionej diagnozy innowacyjności..... 2018).

As regards Poland's GERD, its value slightly diminished in 2015-2016. In the case of the Małopolskie Voivodweship, the situation is different and showed an upward trend. GERD rose particularly sharply between 2015 and 2016, i.e. by 48 %. Even a sharper rise has been seen in regard of BERD – between 2015 and 2016 in the Malopolska region it went up by 150 %. Such sharp rise results from the significant increase of R&D expenditure (overall and in the case of enterprises, as well) with the voivodeship's insignificant rise of GDP. One of reasons of such sharp rise of the expenditure is the fact that in 2016 the entities seated in the Malopolskie Voivodeship obtained the highest amount of Smart Growth Operational Program (POIR) funds – the value of funding agreements in Malopolska amounted to EUR 133.58m, i.e. 8 % more compared to the Mazovian Voivodeship which ranked second (Aktualizacja pogłębionej diagnozy innowacyjności..... 2018).

It is a positive phenomenon in the context of the region's innovativeness. It should be noted in that context that GERD is also affected by expenditures incurred by research units whose saturation

(both in the Malopolskie and Mazowieckie Voivodeships that are in the lead in terms of the value of that rate) is high.

Compared to the EU average and selected regions, the Malopolskie Voivodeship's R&D expenditure was much lower until 2015. In 2016 total R&D expenditure and the R&D expenditure of the sector of enterprises rose significantly and slightly exceeded the EU average. In 2016 Malopolska's GERD was 22 % higher vis-a-vis the EU average and in 2016 BERD was 25 % higher.

Malopolska's R&D expenditure *per capita* has also demonstrated an upward trend. Between 2007 and 2015 it rose by EUR 88, namely, the increase by 250 %. Average R&D expenditure *per capita* is 34 % higher than the domestic average, however, it accounts for nearly 50 % of the analogical expenditure recorded for the Mazovian Voivodeship. Given the 2016 data, it should be expected that the trend will be upward (Aktualizacja pogłębionej diagnozy innowacyjności..... 2018).

As regards the comparison of average R&D expenditure incurred by the Malopolska region and selected European regions in EUR (*per capita*) in 2007-2015, it is not so favorable. The expenditure of the Malopolska region in 2015 was 3.9 times lower than the average EU expenditure, but at the same time such difference has been diminishing year by year. On the other hand, the expenditure incurred by the Malopolska region has been increasing at a faster pace than in the European Union. Although slow in general, those changes have been showing an upward trend which has a positive effect on the increase of the region's innovations.

Conclusions, proposals, recommendations

The increasing innovation expenditure recorded in the case of Polish SMEs is an opportunity to accelerate Poland's economic growth. The analysis of the structure and dynamics of the innovation expenditure showed that it is small industrial enterprises that have been investing in innovations and regularly increasing their innovation expenditure.

SMEs have seen that the Polish economy has large innovation potential and possible R&D activities that can be undertaken by them have significant impact on the development of modern product and process solutions and the scale of expenditure made towards innovations.

- 1) The change of the structure of expenses towards innovations in Poland has been observed for a few years, especially in the case of industrial processing enterprises– on average 85 % of the expenditure and in the case of the Malopolska region - 79 %.
- 2) The Malopolska region's R&D expenditure *per capita* continues to grow. In 2007 – 2015, that figure was EUR 88 higher (the rise by 250 %).
- 3) Average R&D expenditure *per capita* of the Malopolskie Voivodeship is 34 % higher than the average figure in Poland, however, it accounts for less than 50 % of the analogical expenditure recorded by the Mazowieckie Voivodeship.

Bibliography

1. Grudzewski, W. M., Hejduk, I. K. (2004). Metody projektowania systemów zarządzania (*Methods of designing management systems*). Difin. Warszawa
2. Jasiński, A. (1995). Przedsiębiorstwo innowacyjne na rynku (*An innovative enterprise on the market*), „Marketing i Rynek” (*Marketing and the Market*). No 3, pp. 2.
3. Pawłowski, J. (2005). Diagnoza potencjału innowacyjności i konkurencyjności przedsiębiorstw (*Diagnosis of enterprises' innovativeness and competitiveness potential*). „Przegląd Organizacji”. pp. 5- 29.
4. Poland climbs to 39th position in Global Innovation Index, Access: <https://polska.pl/economy/investments-projects/poland-climbs-39th-position-global-innovation-index/>. Retrieved: 28.12.2018
5. Przedsiębiorczość w Polsce (*Entrepreneurship in Poland*). (2018). Ministerstwo Przedsiębiorczości i Technologii (*the Ministry of Entrepreneurship and Technology*)

6. Warunki zdynamizowania innowacji w polskich przedsiębiorstwach przemysłowych. Raport z realizacji grantu Narodowego Centrum Nauki w Krakowie. (*Conditions of the dynamization of innovations in Polish industrial enterprises. A report on the implementation of a grant by the National Science Center*) K. Poznańska i S. Sudoł (red.). 2016. Wyd. Wyższej Szkoły Menedżerskiej w Warszawie im. Prof. L.J. Krzyżanowskiego, Warszawa
7. Wielewska, I., (2017). Eco-innovations and sustainable development of businesses in rural areas of Kujawsko-pomorskie Province of Poland [in:] Economic Science for Rural Development. Proceedings of the International Scientific Conference, No 44, Latvia University of Agriculture, Jelgava, pp. 205-211.
8. Zuzek, D. K., Wielewska, I. (2017). Rola innowacji w generowaniu przewagi konkurencyjnej małych i średnich przedsiębiorstw w regionie małopolskim (The role of innovation in generating the competitiveness of small and medium enterprises in malopolska region) [in:] Marketing i Rynek, No 10, pp. 798-807.
9. Zuzek, D., Paluch, Ł. (2016). Wpływ działalności innowacyjnej na konkurencyjność sektora MSP w Polsce (*The impact of innovative activities on competitiveness of the SMEs sector in Poland*). Marketing i Rynek, no10, pp. 632 – 642.

MOTIVATION FACTORS FOR REZEKNE MUNICIPALITY ENTREPRENEURS TO ENGAGE IN MENTORING ACTIVITIES

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Abstract. In recent years, the role of mentoring in entrepreneurship is increasingly discussed by scientists and the public. The research aim is to identify and analyse motivational factors for entrepreneurs in Rezekne municipality to engage in mentoring activities. The theoretical literature review done by the authors shows that mentoring refers to relationships and communication that involve sharing experience and support provided by an individual who shares his/her knowledge, experience and wisdom to another individual – a mentee – who is ready and who has a wish to benefit from the exchange and to improve his/her professionalism. The research results revealed that in Rezekne municipality, entrepreneurs were motivated to get new contacts and cooperation partners and have an opportunity to do a job benefiting the entire society. However, mentees were motivated by an opportunity to learn and increase their self-confidence and a wish to successfully start up a business. The survey done by the authors revealed that mentoring in entrepreneurship in Rezekne municipality could contribute to the development of unexperienced enterprises. Mutual communication between potential mentors and mentees would avoid a lack of information and advice, and sharing experience would develop their initiative. Accordingly, it is necessary to continue the research started by the authors by establishing a database for and identifying potential mentors and mentees in the other municipalities of Latgale region who can and are ready to engage in the business mentor network.

Key words: mentoring, mentor, motivational factors, mentee.

JEL code: A00; L26.

Introduction

Steady economic growth in the regions of the country plays an important role in the growth of the national economy. Reports, research investigations and publications by the Ministry of Economics of the Republic of Latvia, the State Regional Development Agency and the Bank of Latvia indicate that disparities in income, employment opportunities and output between the central part of Latvia and the other part of the country, particularly Latgale region and southwestern Kurzeme, continue increasing (Ekonomikas ministrija, 2017).

To reduce territorial disparities, the government produced the Regional Policy Guidelines for 2013-2019 that are, to some extent, a continuation of the Action Plan for Growth in Latgale Region 2015-2017 (VARAM, 2017). Both documents envisage the improvement of transport infrastructures to reach development centres and financial and technical assistance for entrepreneurship, the revitalisation of degraded areas and other activities throughout Latvia and Latgale region in particular. However, as pointed out by the Ministry of Economics, to achieve faster growth in Latgale, it is necessary to focus on the development centres of the region by promoting the attraction of foreign investments and the transfer of technologies as well as the development of industrial areas and human resources (Ekonomikas ministrija, 2017).

Researcher R.Zvirgzdina who examined business development in the rural areas of Latvia believes that fostering economic activities in the rural areas requires a comprehensive approach, which would involve retraining the rural population and creating opportunities for acquiring basic knowledge of business, general economic knowledge and advice (Zvirgzdina R., 2006). Other researchers who

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examined the entrepreneurial environment in the regions (LU, 2010; LIAA, 2009; Altum, 2017) referred to the need to apply experience transfer techniques. Such an opportunity is provided by mentoring whereby experienced mentors transfer their knowledge to mentees. Mentoring is based on the knowledge and experience of a mentor that allows a mentee to consider his/her disposable options and resources and encourages the mentee to use them to solve some problem or achieve a goal (Konstantinova E., Rivza B., 2007).

According to Lursoft data, the number of liquidated enterprises considerably rose in 2018 (Lursoft, 2019). The problems of the failed enterprises were diverse, yet the key problems, particularly for new enterprises, were as follows: 1. lack (inaccessibility) of funds; 2. lack of knowledge and experience;

3. lack of connections and contacts in the relevant business field (Biedriba „Lietisko sieviesu apvienība”, 2012). There are still No unified and complex solutions to meet all the needs in the field of transfer of knowledge and experience in all the regions of Latvia.

The research hypothesis is as follows: it is impossible to determine the motivational factors for entrepreneurs in Rezekne municipality to engage in mentoring activities.

The research aim is to identify and analyse the motivational factors for entrepreneurs in Rezekne municipality to engage in mentoring activities.

To achieve the aim, the following specific research **tasks** are set: 1. to examine the theoretical aspects of mentoring; 2. to assess the results of a survey of mentors and mentees in Rezekne municipality.

Research methods employed: monographic and descriptive; analysis and synthesis, statistical analysis and sociological methods – surveying and interviewing.

The research conducted a survey of mentors (entrepreneurs) and mentees with the aim of collecting information and data on entrepreneurs wishing to participate in business mentor network activities in Rezekne municipality. Questionnaires were sent electronically, enterprise managers were spoken to in person and interviewed via phone as well as the questionnaires were published on the Facebook page of the Rezekne municipality local government. Two kinds of questionnaire were disseminated, appealing to current entrepreneurs being ready to become mentors as well as future entrepreneurs wishing to learn and get inspired by experienced entrepreneurs. This study was conducted from November 2018 to January 2019.

The research used the specific literature on mentoring and business development, the legal frameworks and policy documents of the Republic of Latvia and the EU, publications and other sources, relevant research papers of national and foreign scientists as well as industry specialist articles on the given topic.

Research results and discussion

1. Theoretical aspects of mentoring

In recent years, mentoring as a kind of knowledge transfer became increasingly popular and widespread in Latvia. This means that a person (mentor) having experience in a relevant field transfers the experience to a person (mentee) having No such experience or having little experience.

The origins of mentoring are found in Japan, England, Sweden and the USA, yet mentoring soon became popular in the other European countries as well. The way mentoring is used slightly differs in each country. In North America, mentoring is mainly used for career growth, and the mentor is responsible for building up skills and talents in the mentee and for the mentee's career growth, while

in European mentoring the mentor helps the mentee to enhance the skills and make success him/herself (LIAA, 2009).

In Europe, mentoring takes various forms, it has adapted to various purposes and needs and found diverse uses.

Effective business mentoring is based on the mentor's knowledge of and experience in business and communicative skills as well as the encouragement of the mentee in a friendly and positive way (LIAA, 2012). Mentoring is an effective knowledge transfer process that came to Latvia owing to assistance provided by the European Commission; it is implemented by experienced mentors working with their mentees (Konstantinova E., Rivza B., 2007). Researcher Stern, however, points out that the history of mentoring as a knowledge transfer process is long. In Latvia, this approach has been employed since the 14th century – masters from various fields taught their apprentices who later became masters themselves, transferring their skills to others (Sterns I., 1997).

Scientist R.Sullivan stresses the strong relationship between the mentor and the mentee that creates a safe environment for the growth and development of the mentee (Sullivan R., 2000). This opinion is supported by researchers who emphasise that the mentor has to be sensitive to the emotional and intellectual world of the mentee. Sensitivity is the basis for trust in relations between mentoring participants and better conditions for learning. This perspective of mentoring is typical of mostly psychology and education researchers (Konstantinova E., 2008).

Researcher E.A.Ensher defines mentoring as „...prudent formation of pairs of persons with different experience and skills with the aim of contributing to the growth of, and building up specific skills in less experienced persons...” (Ensher E.A. et al., 2002). According to researchers D.Clutterbuck and D.Meginson, the mentor becomes a trusted person and, giving assistance, achieves considerable change in the mentee's knowledge, work and thinking (Clutterbuck D. et al., 2005).

Mentoring could be characterised as bilateral „communicative relations” that consist of verbal and nonverbal behaviour and whose goal is to offer or request assistance. Performing this dialogue communication, mentors develop and give relevant messages that are referred to as a specific communicative behaviour or one party's action aimed at benefitting someone or helping others (Burleson B. et al., 2002). This implies mentors have to regularly adapt their communication in order to understand the needs of the other party; therefore, both parties need an understanding of their communication style and a wish to objectively assess the behaviour of the person assisted (Radu Lefebvre M., Redien-Colloot R., 2013).

The literature review of mentoring has revealed that gender effects on mentoring programmes are extensively analysed and researched. In the world, most of the mentors are men, as the men are those who take leading job positions at many companies. It has been found that mentors play a great role in men's career growth and even a greater role in women's career growth (Burke R.J. et al., 1994). As found in research studies, both male and female mentees confirmed that they were more satisfied with the mentors who provided psychological support for their career growth. It was found that the relations between the mentor and the mentee could range from excellent to very unsatisfactory (LIAA, 2009). This allows concluding that mentors themselves do not guarantee growth, yet the quality of growth depends on the relations between the mentor and the mentee or more precisely, consistency between the mentee's needs and the mentor's ability to support the needs (LIAA, 2009).

The authors' theoretical literature review indicates that mentoring refers to relationships and communication that involve sharing experience and support provided by an individual who shares his/her knowledge, experience and wisdom to another individual – a mentee – who is ready and who has a wish to benefit from the exchange and to improve his/her professionalism. Since mentoring requires the mentor to go deep into in the mentee's problems and the matters to be discussed, the mentor does not teach but encourages the mentee him/herself to make a decision.

Further, the authors analyse the results of a survey of mentors and mentees in Rezekne municipality.

2. Results of the survey of mentors and mentees in Rezekne municipality

The quantitative survey of entrepreneurs was conducted from November 2018 to January 2019. Among the respondents, women represented 18.2 % and men 81.8 %; the highest percentage (36.4 %) was found for the group aged 41-45 who had a Bachelor's degree or second-level professional higher education (36.4 %) in natural sciences (36.5 %). Among the mentees, 52.6 % were women and 47.4 % were men; the highest percentage (31.6 %) was observed for the group aged 26-30 who had a Bachelor's degree or second-level professional higher education in social sciences (36.5 %).

The surveyed enterprises engaged in mentoring were divided into three categories: 1. microenterprises (0-5 employees) – 72.7 % of the total respondents; 2. small enterprises (6-10 employees) – 18.2 % of the total respondents; 3. medium enterprises (31-40 employees) – 9.1 % of the total respondents.

The participation activity of entrepreneurs (mentors) in the survey was low in Rezekne municipality. Only 11 questionnaires were received back from entrepreneurs (mentors) and 19 from future or new entrepreneurs (mentees).

Based on the information available in public databases and on the Internet, 98 enterprises registered in Rezekne municipality (Table 1) were selected; the enterprises were sent an invitation to participate in the online survey conducted by use of the indirect surveying method (information on the survey was sent to the potential respondents via email, requesting them to fill in a questionnaire electronically on the portal google.com. The invitation was sent twice – in the beginning of November 2018 and in December (the second one was a reminder about the participation in the survey). In view of the low activity of entrepreneurs, the authors made a decision to do interviews by phone, speaking to every potential respondent in person and filling in questionnaires themselves.

Table 1

Characteristics of the sample reached

Kind of study	Number
Number of email addresses that were sent an invitation to participate in the survey	98
Number of completed web questionnaires	12
Telephone – the number of interviews	25
Size of the sample	37
Number of valid and processed questionnaires	30

Source: authors' study

To reach a larger number of potential mentees, which could be also represented by entrepreneurs who are establishing their own enterprise or only plan to do it and their contact information is not available publicly, the authors used an opportunity to publish the questionnaires on the Facebook page of the Rezekne municipality local government.

A questionnaire was filled in for every entrepreneur individually (or it was done by the entrepreneur him/herself). The research group tested the questionnaires received for validity. The questionnaires meeting the quality standards were prepared for data processing and summarisation.

Among the respondents – Rezekne municipality entrepreneurs (mentors) –, the highest percentage was found for those representing enterprises engaged in agriculture, forestry and fisheries, wholesale and retail trade and repair of motor vehicles and motor cycles (27.3 %). Of the respondents, 36.4 % indicated that earlier they worked in another enterprise engaged in the same field of economic activity; 90.9 % noted that besides entrepreneurship they had experience in other fields, the duration of their enterprises was 6-10 years (45.5 %) and the average number of employees was 0-5 (72.7 %).

As regards the mentees, the highest percentage was found for those representing enterprises engaged in agriculture, forestry and fisheries as well as accommodation and food service activities (21.1 %). Of the respondents, 42.1 % indicated their enterprises were in the process of establishment.

To identify the factors motivating Rezekne municipality entrepreneurs – potential mentors – to engage in the mentoring network, a question was asked, „What factors motivate you to engage/work in business mentor network activities as a mentor” (n=11)?” (Table 2).

Table 2

Factors motivating individuals to engage in business mentor network activities as a mentor, (n=11) (respondents could choose several reply options)

Factors	Replies		Occurrence frequency, %
	Number	% of total	
Opportunity to do a job benefitting the entire society	4	22,2	36,4
Opportunity to help others to successfully start up a business	3	16,7	27,3
Opportunity to get new contacts/cooperation partners	6	33,3	54,5
Opportunity to contribute to self-development and self-confidence	3	16,7	27,3
Others	2	11,1	18,2
Total:	18	100,0	163,6

^aDichotomy group tabulated at value 1

Source: authors' study

Of the respondents, 33.3 % referred to „Opportunity to get new contacts/cooperation partners” and 22.2 % – „Opportunity to do a job benefitting the entire society” as important motivational factors. „Opportunity to help others to successfully start up a business” and „Opportunity to contribute to self-development and self-confidence” were also considered important motivational factors by 16.7 % respondents. Those who ticked the reply option „Others” wrote that they would be motivated by guaranteed remuneration or another material benefit.

To identify the factors motivating entrepreneurs – mentees – to engage in the mentoring network, a question was asked, „What factors motivate you to engage/work in business mentor network activities as a mentee?”

Of the respondents, 34.5 % considered „Opportunity to learn and get confidence in one's own abilities” an important motivational factor, while 24.1 % would be motivated by the „Wish to successfully start up a business” and 20.7 % – by the „Opportunity to get new contacts/cooperation partners”. A relatively low percentage, 6.9 %, of the respondents saw No motivation to engage in the mentoring network (Table 3).

Table 3

Factors motivating individuals to engage in business mentor network activities as a mentee, (n=19) (respondents could choose several reply options)

Factors ^a	Replies		Occurrence frequency, %
	Number	% of total	
Get advice on/a solution to business problems	4	13.8	21.1
Wish to successfully start up a business	7	24.1	36.8
Opportunity to get new contacts/cooperation partners	6	20.7	31.6
Opportunity to learn and get confidence in one's own abilities	10	34.5	52.6
No motivation	2	6.9	10.5
Total:	29	100.0	152.6

^aDichotomy group tabulated at value 1

Source: authors' study

The survey data revealed that most respondents – both potential mentors and mentees – considered purposefulness and persistence to be the most important personality traits contributing to success in entrepreneurship, 24.4 % and 21.4 % of the total replies, respectively (Table 4). The potential mentors also referred to diligence, love for work and knowledge and education. The mentees recognised diligence, love for work and the sense of responsibility and duty as equally important. The mentors, choosing the reply option „Others“ (9.8 % of the total replies), indicated the following: foreign language skills, optimism and employee management. The mentees (7.1 % of the total replies), however, specified that the heart had to be put in work, success was needed or you had to be at the right place and time, contacts were needed, and not only knowledge and experience.

Table 4

Personality traits contributing to success in business and management, %
 (respondents could choose several reply options)

Traits	Mentors (n=11)	mentees (n=19)
Purposefulness and persistence	24.4	21.4
Communicative skills	9.8	12.5
Knowledge and education	14.6	12.5
Diligence, love for work	19.5	16.1
Sense of responsibility and duty	4.9	16.1
Flexibility, adaptation	9.8	5.4
Tendency to risk	7.3	8.9
Others	9.8	7.1
Total:	100.0	100.0

Source: authors' study

The potential mentors, assessing hardships and problems they had faced when starting up their businesses, noted a lack of capital and funds and a lack of information/advice as the most important factors. A lack of contacts and cooperation, difficulty in combining family life and work, a lack of a workforce and problems with selling the product were equally assessed by them.

The mentees, assessing the most considerable barriers to entrepreneurship, recognised a lack of funds, a lack of resources and relevant experience and a lack of initiative as the most important ones. Besides, 17.6 % of them hoped that they would attract more investment and funds for their enterprises by means of a mentor. The survey results confirmed the necessity for a business mentor network, as well as the need for financial support instruments for entrepreneurs.

The survey results revealed that neither the mentor's age and gender nor his/her job position were important to the mentees, while the mentor had to possess the following traits of character: esteem, leadership, honesty and talent.

The authors' research indicates that mentoring in entrepreneurship could contribute to the development of unexperienced enterprises in Rezekne municipality. Bilateral communication between potential mentors and mentees would avoid a lack of information and advice, and sharing experience would contribute to their initiative. Therefore, it is necessary to continue the research started by the authors by establishing a database for and identifying potential mentors and mentees in the other municipalities of Latgale region who can and are ready to engage in the business mentor network.

Conclusions

- 1) Mentoring is one of the most effective ways of how to transfer experience among enterprises by actively sharing knowledge, experience and contacts. Mentoring in entrepreneurship is mainly used for developing new and unexperienced enterprises.
- 2) In Rezekne municipality, entrepreneurs are motivated to become mentors by an opportunity to get new contacts/cooperation partners and to do a job benefitting the entire society. Mentees, however, are motivated by an opportunity to learn and get confidence in one's own abilities and a wish to successfully start up a business.
- 3) The hypothesis put forward by the research did not prove to be true, and, the authors believe, continuing the research would clearly identify the motivational factors.
- 4) The survey revealed that most respondents – both potential mentors and mentees – considered purposefulness and persistence to be the most important personality traits contributing to success in entrepreneurship. The potential mentors also referred to diligence, love for work and knowledge and education. The mentees, however, recognised diligence, love for work and the sense of responsibility and duty as equally important.
- 5) It is necessary to continue the research started by the authors by establishing a database for and identifying potential mentors and mentees in the other municipalities of Latgale region who can and are ready to engage in the business mentor network.
- 6) The authors believe that the local government of Rezekne municipality and advisors in entrepreneurship should promote the dissemination of information about business opportunities, ideas and experience as well as business success stories, as the survey revealed that mentees would appreciate an opportunity to learn from mentors – experienced entrepreneurs.



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Bibliography

1. Attīstības finansu institūcija Altum (2017). ALTUM pētījums: Iesaistoties uzņēmējdarbībā, uzlabojas apmierinātība ar dzīvi un finansiāla situācija (Development Finance Institution Altum. Altum Study: Engagement in Business Enhances Satisfaction with the Life and the Financial Position). Retrieved: <https://www.altum.lv/lv/jaunumi/-altum-petijums-iesaistoties-uznemejdarbiba-uzlabojas-apmierinatiba-ar-dzivi-un-finansiala-situacija>. Access: 24.10.2018.
2. Biedrība „Lietisko sieviešu apvienība” (2012) Lietisko sieviešu apvienības administratīvās kapacitātes celsana. Mentoringa programma (Business Women Association. Increasing the Administrative Capacity of the Business Women Association). Retrieved: http://www.sif.gov.lv/nodevumi/nodevumi/4949/mentoringa_programma.pdf. Access: 26.10.2018.
3. Burke, R.J., McKeen, C.A., McKenna, C. (1994). Benefits of Mentoring in Organizations: The Mentor's Perspective. Retrieved: <https://www.emeraldinsight.com/doi/abs/10.1108/02683949410062556>. Access: 30.10.2018.

4. Burleson, B., MacGeorge, E., Knapp, M., & Daly, J. (2002). Supportive Communication. Handbook of Interpersonal Communication (3rd ed., pp. 374-424). London, England: SAGE.
5. Clutterbuck, D., Megginson, D., Garvey, B., Stokes, P., Garrett-Harris, R. (2005). Mentoring in Action, 2nd ed. London: Kogan Page. 288 p.
6. Ensher, E.A., Murphey, S.E., Vance, C.M. (2002). Mentoring and Self-management Career Strategies for Entrepreneurs. International Journal of Entrepreneurship and Innovation, vol.1, No.2, pp.99-108.
7. Konstantinova E., Rivza, B. (2007). Mentoringa rokasgramata. Metodiskais materials. LLU sadarbība ar Interreg III B projektu FEM (Mentoring Handbook. Methodological Material. LLU in cooperation with Interreg III B project FEM (Female. Entrepreneurs' Meetings in the Baltic Sea Region)), Jelgava.
8. Konstantinova, E. (2008). Mentorings ka zināšanu pārnese process uzņēmējdarbības veicināšanai Latvijas laukos. Promocijas darbs ekonomikas doktora (Dr.oec.) zinātniska grāda iegāšanai (Mentoring as Knowledge Transfer Process for Promoting Entrepreneurship in Rural Areas of Latvia. Dissertation for the scientific degree of Dr.oec.), LLU.
9. Latvijas Investīciju un attīstības aģentūra (2009). Labas prakses piemēri mentoringa (Best Practice Examples in Mentoring). Retrieved: www.liaa.gov.lv/files/liaa/attachments/16_labas_prakses_piemeri_mentoringa.pdf. Access: 24.10.2018.
10. Latvijas Investīciju un attīstības aģentūra (2012). Biznesa mentoru tīkla rokasgrāmata mentoriem un pieredzes pārnēmjiem (Investment and Development Agency of Latvia. Business Mentor Network Handbook for Mentors and Mentees). Retrieved: http://new.lkkc.lv/sites/default/files/baskik_p/pielikumi/mentorings-vadlinijas.pdf Access: 03.09.2018.
11. Latvijas Universitāte. (2010). Mentoru rokasgrāmata (University of Latvia. Mentor's Handbook). Retrieved: <https://skolas.lu.lv/mod/resource/view.php?id=20582>. Access: 24.10.2018.
12. LR Ekonomikas ministrija (2017). Aseradens: reģionu attīstības sekmēšana ir Latvijas ekonomikas straujākas izaugsmes avots (Ministry of Economics of the Republic of Latvia. Aseradens: Promoting Regional Development is a Source of Faster Economic Growth in Latvia). Retrieved: <https://em.gov.lv/lv/jaunumi/14899-asera-dens-regionu-attistibas-sekmesana-ir-latvijas-ekonomikas-straujakas-izaugsmes-avots> Access: 01.10.2018.
13. Lursoft (2019). 2018.gada jauns likvidēto uzņēmumu skaita rekords (2019) (New Record of the Number of Liquidated Enterprises in 2018). Retrieved: <http://blog.lursoft.lv/2019/01/02/2018-gada-jauns-likvideto-uznemumu-skaita-rekords/> Access: 10.01.2019.
14. Radu Lefebvre, M., Redien-Collot, R. (2013). „How to do Things with Words”: The discursive dimension of experiential learning in entrepreneurial mentoring dyads. Journal of Small Business Management, 51, pp.370-393.
15. Sullivan, R. (2000). Entrepreneurial Learning and Mentoring. International Journal of Entrepreneurial Behaviour and Research, vol.6, No.3, pp.160-175.
16. Sterns, I. (1997). Latvijas vēsture 1290-1500 (History of Latvia 1290-1500). Daugava, Rīga. 478 p.
17. Vides aizsardzības un reģionālās attīstības ministrijas darbības stratēģija 2017. - 2019.gadam (2017) (Operational Strategy for the Ministry of Environmental Protection and Regional Development for 2017-2019). Rīga, 50 p.
18. Zvirgzdina, R. (2006). Uzņēmējdarbības aktivizēšana lauku reģionos globalizācijas kontekstā (Enterprises Activated in Country Regions in Global Context), Economic Science for Rural Development, No. 10, pp. 227-233.

PRODUCTION AND CO-OPERATION IN AGRICULTURE

PROCUREMENT OF ORGANIC FOOD BY LATVIAN SCHOOLS

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Abstract. Organic and local food are a focus in discussions on sustainable school catering systems. A number of European regions have already implemented public procurement policies that give a priority to the use of organic food in school meals. At present, Latvia has not designed a single policy on public food procurement. As a result, progression towards green public procurement is hindered. The research aim is to analyse the public procurement of organic food by educational institutions in Latvia. The research employed document analysis, the monographic method and descriptive statistics. A case study of the involvement of certified organic enterprises focused on the results of the EU-co-funded programme „School Milk and Fruit” for the period 2014-2017. The research found that local farmers could provide local schools and kindergartens with organic food, as the organic farming system was economically diversified. Besides, farmers preferred selling their organic produce in the market rather than using it for self-consumption. The current involvement of certified organic enterprises in public food procurement is low. It is affected by both exogenous and endogenous factors. Strategies on public organic food procurement should be designed by local governments based on an analysis of the situation in the particular region. The analysis would allow identifying territorial factors and market constraints, based on which the local governments could design an organic food „basket”, determining the price and product quality standards.

Keywords: organic food, public procurement, supply chain, schools.

JEL code: Q1; O13; P36.

Introduction

The European Union moves towards environment-friendly public procurement by educational institutions. Organic and local food is in the centre of discussion on sustainable school catering systems. It is believed the public organic food procurement contributes to the regional economy and sustainable resource use. Over the last decades, researchers as well as national and municipal institutions have focused on sustainable food, including organic, procurement by schools (Filippini R., De Nonib I. et al., 2018). At present, a number of European regions have already implemented public procurement policies that give a priority to the use of organic food in school meals (Braun L. C., Rombach M et al., 2018). For example, in the city of Malmo in Sweden, organic food procured by schools account for 40 % of the total amount of food procured by schools; in Rome (Italy) – 69 %, while in Denmark from 2015 onwards organic food has to make up 90 % of the total amount of food procured (Biologisko partikas produktu...,2014). At present, Latvia does not have a single policy on public food procurement by educational institutions. Public procurement is carried out in accordance with the Public Procurement Law and Cabinet Regulation No. 172 Regulations regarding Nutritional Norms for Educatees of Educational Institutions, Clients of Social Care and Social Rehabilitation Institutions and Patients of Medical Treatment Institutions. The economically most advantageous tender for the supply of food to educational institutions is determined based on a criteria rating scale. A good illustrative example regarding organic food consumption at educational institutions in Latvia is the EU-co-funded Rural Support Service programme for the supply of vegetables, fruits and milk to schools. To date, the key barriers to the supply of organic food to schools and kindergartens in Latvia were considered to be high prices and bureaucratic rules for public procurement. Approximately 20 % of the total amount of food consumed by the population is the food procured by national and municipal institutions, and a considerable proportion of it is consumed by schools and kindergartens (Biologisko partikas produktu..., 2014). The research **object** is organic food. The research **subject** is the demand of organic food in the

public procurements by educational institutions in Latvia. The research aim is to analyse the public procurement of organic food by educational institutions in Latvia. Research **tasks**:

- 1) to analyse the organic food production output in the years 2012 to 2017;
- 2) to estimate the consumption trends of fruits, vegetables, fresh milk within the EU co-funded programmes for public schools from 2014 till 2017;
- 3) to define the main obstacles for inclusion of organic food within the public procurements for schools in Latvia.

The research analysed the quantity of organic food produced in the period 2012-2017 by food category as well as the consumption of the organic food. Employing the case study method, the research analysed previous school food programmes regarding the supply of fruits, vegetables and fresh milk implemented in the period 2014-2017 as well as identified the key obstacles to the public procurement of organic food by schools.

Research results and discussion

1. Output of organic food in Latvia in the period 2012-2017

The most popular kinds of organic food in the EU were fresh fruits and vegetables, accounting for approximately a fifth of the total organic food turnover in Italy, Ireland, Norway, Sweden and Denmark. The Nordic countries demonstrated a very high proportion of organic dairy products in total milk output, while organic meat products were very popular in Belgium, the Netherlands, Finland and France, which comprised about 10 % of the total quantity of organic food. Organic drinks had a considerable market share in Croatia and France, wine in particular, accounting for more than 10 % of the total market (Organic farming statistics..., 2015).

The organic farming system in Latvia is economically diversified. The dominant organic industries were crop production (36 %), milk (21 %), beef cattle (9 %), pig (9 %), fruit (8 %), vegetable (8 %) and goat production (8 %), while sheep, rabbit and poultry production are less popular (Biologiska lauksaimniecība..., 2013). In the period 2012-2017, the highest growth rate was reported for vegetable production (58.3 %) and hen egg production (31.4 %), while the production of meat (-11.1 %), potato (-3.9 %) and honey (-1.4 %) decreased (Table 1).

Table 1

Output of certified organic food in Latvia in the period 2012-2017, thou. t

Product	2012	2013	2014	2015	2016	2017	Average change, %
Milk, thou.t	69.1	69.6	74.9	83.5	98	96.5	7.1
Grain, thou.t	56.9	50.9	57.8	77.8	85.5	80.9	8.4
Potato, thou.t	21.7	19.2	18.1	19.5	19.6	17.5	-3.9
Meat, thou.t	3.2	3.5	2.9	2.7	1.6	1.6	-11.1
Fruits and berries, thou.t	1.5	1.9	2.6	2	3.2	2.5	15.7
Vegetables, thou.t	0.8	3.2	2.4	2.2	2.9	2.7	58.3
Hen eggs (mln. pcs.)	0.55	0.55	0.63	1.2	1.6	1.9	31.4
Honey, thou.t	0.25	0.23	0.26	0.5	0.5	0.4	-1.4

Source: authors' calculations based on Latvijas lauksaimniecība 2015, 2016, 2017

In 2017, the proportions of grain (80.9 thou.t.) and potato (17.5 thou.t) in the total output of crops were the highest, while milk production (96.5 thou.t.) had the highest proportion in the total output of livestock products. An analysis of ten educational institution statutes in relation to food purchase through public procurement tendering revealed that the food was divided into 14 categories: 1) milk and dairy products; 2) meat and meat products; 3) frozen products; 4) bread

and bakery products; 5) non-perishable foods; 6) eggs; 7) sugar; 8) fruits and vegetables; 9) apples; 10) blackcurrants; 11) potato; 12) cabbage; 13) carrot; and 14) red beet. This allows concluding that out of the 14 categories, sugar and part of non-perishable foods, e.g. rice, salt and cacao, are not organic products. Any educational institution procures food in accordance with the Public Procurement Law; therefore, the procurement procedures and documentation are the same. The tendering process is usually carried out in summer. This, in its turn, makes planning operations and supplying the products difficult for businesses. Besides, procurement documents prescribe one winner in each product category, which, in its turn, prevents organic farms from supplying, for example, buckwheat in case the farms cannot supply another kind of non-perishable foods. In this way, educational institutions give advantages to wholesalers rather than local farmers.

According to a fact sheet website on the European Union, a large number of self-consumption farms is characteristic of Latvia (Faktu lapa par..., 2015). Basic data on organic food are shown in Table 2. The authors identified the situation with organic farming based on a case study.

Table 2

Production, sales and self-consumption of organic food in Latvia in the period 2012-2017, thou. t

Primary products	2012			2017			Change in quantity sold 2017/2012
	Produced	Sold	Self-consumed	Produced	Sold	Self-consumed	
Milk	69.1	56.66	12.44	96.5	79.23	17.27	22.56
Grain	56.9	19.35	37.55	80.9	36.97	43.93	17.63
Potato	21.7	4.56	17.14	17.5	6.20	11.31	1.64
Meat	3.2	2.94	0.26	1.6	1.40	0.20	-1.54
Fruits and berries	1.5	0.77	0.74	2.5	1.04	1.46	0.27
Vegetables	0.8	0.18	0.62	2.7	0.93	1.77	0.75
Hen eggs	0.55	0.26	0.29	1.9	0.79	1.11	0.54
Honey	0.25	0.16	0.09	0.4	0.21	0.19	0.05

Source: authors' calculations based on Latvijas lauksaimniecība, 2013, 2018

In 2012, as shown in Table 2, the most market-oriented commodities were milk, meat and honey. The proportion of quantity sold for the mentioned commodities exceeded 70 %, whereas the other commodities – grain, potato, fruits, berries, vegetables and hen eggs – were mainly self-consumed. In 2017 compared with 2012, the kinds of market-oriented commodities have not changed, yet overall the quantity sold increased for all the product categories, except meat. This means organic farmers perceive this kind of farming as a source of profits and consider sales opportunities, environmental protection and healthy nutrition.

Overall, one can conclude that educational institutions can potentially purchase organic food. An illustrative example regarding organic food consumption at educational institutions in Latvia is the EU-co-funded Rural Support Service programme for the supply of vegetables, fruits and milk to schools.

2. Organic food for the EU-co-funded programme „School Milk and Fruit”

The EU-co-funded programme „Support for Purchasing Dairy Products for Educatees” or the „School Milk” programme is one of the single market support instruments, even though the key objectives of the programme pertain to promoting healthy nutrition and milk consumption among schoolchildren rather than market regulation. On 1 October 2015, the principles of calculation of national co-funding rates were changed, pegging the rates to the quarterly change in milk purchase

prices (Table 3). Furthermore, the national co-funding rates were differentiated according pack volume (packs sized less than 250 ml and packs sized more than 250 ml), including the possibility to set an extra subsidy for milk produced in compliance with organic farming scheme requirements. At the same time, maximum support thresholds (comprised of EU funding and national co-funding) and maximum costs pertaining to milk processing, packaging, transport and distribution applicable to every academic year were set as well. In Latvia, any milk producer, dairy product distributor, the educational institution itself as well as the local government in whose administrative territory the particular educational institution is located may participate in the programme. The programme is administered by the Rural Support Service. National co-funding is granted for the supply of pasteurised drinking milk (without additives, flavourings, sweeteners etc.) to preschool and general education 1st-9th-year educatees. The educatees are given an opportunity to get a glass of milk (up to 250 ml) free of charge every day owing to the national co-funding. In the reporting period from the academic year 2014/2015 through to the academic year 2016/2017, the implementation of the programme „School Milk” continued expanding in terms of amount of support paid and number of educatees involved. For example, the amount of support paid (EU funding and national co-funding put together) in the reporting period rose by 4 % or EUR 111.4 thou., while the number of educatees who received dairy products under the programme increased by 8.2 % or 17.8 thou. (Table 3).

Table 3

**Implementation of the programme „School Milk” in the academic years
2014/2015–2016/2017 in Latvia**

Characteristics	Academic year	2014/2015 (01.09.2014- 31.08.2015)	2015/2016 (01.09.2015- 31.08.2016)	2016/2017 (01.09.2016- 08.06.2017)
Number of educational institutions involved		1037	1086	1083
Number of educatees, thou.		217.6	233.1	235.4
Quantity of milk and dairy products, t		4176.6	4761.9	4220.3
Purchase price of non-pasteurised milk, the average for a 3-year period, EUR/l		0.1869	0.1869	0.1869
Support per litre of non-pasteurised milk, EUR/l:		x	x	x
Organic milk		0.9137	0.8945	1.0198
Other milk		0.8763	0.8751	0.9824
Bidders involved in the programme		115	115	115
Certified organic enterprises		0	0	0
Conventional enterprises		115	115	115
Support paid (EU and national funding), thou. EUR		2943.5	2853.3	3054.9
incl. EU funding, thou. EUR		758.0	864.0	765.9
incl. national funding, thou. EUR		2185.4	1989.3	2288.9

Source: authors' calculations based on RSS and Ministry of Agriculture report data, 2017

In the period of analysis, as showed in Table 3, not a single certified organic enterprise participated in the School Milk programme, even though the output of organic milk rose by 7.1 % a year in the period 2012-2017. This means schoolchildren could be provided with organic milk, yet it was not done because out of all the procurement eligibility criteria, the priority was given to the lowest price on milk.

However, the European Commission programme „**School Fruit**” is a way how the Member States, using national and EU funding, can provide schoolchildren with free fruits and vegetables with the aim of increasing the consumption of the products as well as contributing to healthy eating habits among the school children. In the academic year 2016/2017, 780 schools participated in the programme – 0.1 % fewer than in the previous academic year –, yet the number was larger than

the five-year average (778 schools) (Table 4). Under the programme, schoolchildren received 100 grams of fresh fruits (apples, peaches and large cranberries), vegetables (cabbage, kohlrabi, carrot, swede and pumpkin) or a portion of assorted products free of charge three times a week.

Table 4

**Implementation of the programme „School Fruit” in the academic years
2014/2015–2016/2017 in Latvia**

Characteristics	Academic year	2014/2015 (03.11.2014– 27.02.2015)	2015/2016 (02.11.2015– 26.02.2016)	2016/2017 (01.11.2016– 17.02.2017)
Number of schoolchildren - % of the total number of general day-school schoolchildren		92.7	94.4	97.4
Number of educational institutions involved		793	781	785
Quantity of fruits and vegetables distributed, t		711.7	719.0	684.8
Fruit and vegetable subsidy rate, EUR/100 g (unpacked/paced)		x	x	0.12/0.16
Subsidy if products are organic, EUR/100 g		x	x	0.03
Bidders involved in the programme		132	122	267
incl. certified organic enterprises		x	x	5
Support paid (EU and national funding), thou. EUR		1109.2	1114.1	1080.0
incl. EU funding, thou. EUR		850.2	774.6	827.8
incl. national funding, thou. EUR		259	259.4	252.1

Source: authors' calculations based on RSS and Ministry of Agriculture report data, 2017

The Table 4 data allow concluding that the amount of vegetables distributed varied from year to year. Out of all the fruit and vegetable suppliers approved by the Rural Support Service, five were organic enterprises: the farm „Liepkalni-Vezi”, the farm „Kurpnieki”, the agricultural service cooperative „Zalais Grozs”, the farm „Mazie Gavari” and the agricultural service cooperative „Latgales Ekoprodukti”. In general, one can conclude that farmers were reluctant to participate in the school food programmes.

3. Barriers and potential solutions to the inclusion of organic food in school food programmes

Organic food procurement is a structured set of activities affected by a number of factors. First, it is the **seasonality of and logistics for** organic foods (Sonnino, 2009; Risku-Norja and Loes, 2016; Mikkelsen and Sylvest, 2012). For example, the Riga Waldorf School has hired a cook who prepares dishes from seasonal products without using imported vegetables in order to reduce the impact of seasonality on the school menu. As pointed out by the director of the school, „catering enterprises can be flexible enough, yet they are often reluctant to purchase domestic vegetables, as their profits depend on the costs of inputs they buy” (Biologisko partikas produktu..., 2014). At the same time, a study done in Northern Ireland revealed that the introduction of organic food has to be the initiative by catering enterprise management, and the policies of local governments on domestic and certified products have to be also taken into account (Filippini R. , Nonib De I. At al., 2018). In the opinion of the authors, the shorter the food supply chain is, the easier the communication among the parties involved is and the higher the confidence in product quality is. In Latvia, public food procurement requirements usually prescribe that the distance for the delivery of the food has to be less than 100 km. This, in its turn, restricts the delivery of food to cities from remote rural areas. Besides, food with short expiry dates (bread and bakery products, milk and dairy products, meat and meat products) has to be delivered three times a week, while the other foods have to be delivered one-two times a month. In the opinion of the authors, educational institutions have to take into consideration the frequency of food delivery by farmers when producing their public food

procurement rules. The logistics cost decreases farmer profits. For this reason, optimum, i.e. longer delivery times should be set for the food that could be stored for a long period.

Second, unlike wholesalers that can often meet quality standards and food safety and hygiene requirements, **domestic organic food suppliers are unable to meet quality standards** (Risku-Norja and Loes, 2016). For this reason, wholesalers are better suited for public procurement by schools in urban areas, as they can supply the required quantity of food within the desired delivery time and at the required quality.

Third, **organic food prices** are considered to be one of the most important disadvantages of organic food, as organic food consumption is not viewed from the environmental and economic perspectives. (Mikkelsen and Sylvest, 2012).

Fourth, the inclusion of organic food in public procurement largely depends on the parties involved: national institutions, catering enterprises and local governments (Galli et al., 2014). According to the director of the Riga Waldorf School, „organic food could not be procured without support provided by parents and the understanding of the administration of the school that it is worth investing more time and changing practices in order that the schoolchildren can consume domestic organic food” (Biologisko partikas produktu..., 2014).

Fifth, the inclusion of organic food in school food programmes depends on **market constraints**, e.g. the availability and cost of organic food compared with those for conventional food (Mikkelsen and Sylvest, 2012; Risku-Norja and Loes, 2016).

Sixth, the structure of organic food procurement might be affected by **territorial factors** that, on the one hand, indicate the type, diversity and spread of organic farms in the region and, on the other hand, pertain to other territorial aspects, e.g. population density, age structure etc. (Torjusén et al., 2004; Lehtinen, 2012). In the opinion of the authors, procurement documentation has to be prepared in a timely manner – in winter months – so that before sowing, farmers know the quantities of vegetables needed to be supplied next autumn. Unfortunately, practice shows that national and municipal institutions announce calls for tenders in summer when farmers have sown their fields and have already made contracts with potential buyers.

Conclusions, proposals, recommendations

- 1) Public organic food procurement could be a significant local economy instrument for promoting sustainable food consumption. In Latvia, farmers could provide local schools and kindergartens with organic food, as the organic farming system is economically diversified. Besides, farmers prefer selling their organic produce in the market rather than using it for self-consumption.
- 2) At present in Latvia, certified organic enterprises are reluctant to participate in public procurement. In the period 2014-2017, five entrepreneurs participated in the programme „School Milk and Fruit”, while not a single entrepreneur offered to supply organic milk to schools and kindergartens. At the same time in Latvia, the output of organic milk and fruits as well as vegetables exceeds the demand for them.
- 3) The participation of certified organic producers in public food procurement is affected by both exogenous and endogenous factors. Strategies on public organic food procurement should be designed by local governments based on an analysis of the situation in the particular region. The analysis would allow identifying territorial factors and market constraints, based on which the local governments could design an organic food „basket”, determining the price and product

quality standards. Institutions announcing calls for tenders have to take into consideration agricultural seasonality, which affects the production and sales of agricultural products.

Bibliography

1. Biologiska lauksaimniecība 2007-2020 (Organic Farming 2007-2020) (2013). Latvian Organic Farmers Association. Retrieved: http://webcache.googleusercontent.com/search?q=cache:wfCiLkgXv4wJ:laukutikls.lv/system/files_force/informativie_materiali/lbla_nozares_ekspertu_zinojums_2013.pdf%3Fdownload%3D1+&cd=15&hl=lv&ct=clnk&gl=lv. Access:10.01.2019.
2. Biologisko partikas produktu iepirkums skolas – Rigas Valdorfskolas piemērs un praktiski padomi (2014). (Organic Food procurement by Schools: the Example and Practical Advice of the Riga Waldorf School). Retrieved: <http://www.lbla.lv/bio-partikas-produktu-iepirkums-skolas#more-1367>. Access: 09.01.2019
3. Braun, L.C., Rombach, M., Häring, M. A., and Vera Bitsch V. (2018). A Local Gap in Sustainable Food Procurement: Organic Vegetables in Berlin's School Meals. Retrieved: <https://www.mdpi.com/2071-1050/10/11/4245/htm>. Access:10.01.2019.
4. Faktu lapa par Lauku attīstības programmu Latvijai (Fact sheet on the Rural Development Programme of Latvia) 2014-2020 (2015). European Commission. Retrieved: http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/lv/factsheet_lv.pdf. Access:10.01.2019.
5. Filippini, R., Noni De, I., Corsi, S., Bocchi, S. (2018). Sustainable School Food Procurement: What factors Do Affect the Introduction and the Increase of Organic Food? Food Policy, Volume 76, April 2018, pp. 109-119.
6. Galli, F., Brunori, G., Di Iacovo, F., Innocenti, S., (2014). Co-producing Sustainability: Involving Parents and Civil Society in the Governance of School Meal Services. A case study from Pisa, Italy. Sustainability 6, pp. 1643-1666.
7. Haack, M.; von Münchhausen, S.; Häring, A.M. (2016). Discrepancy between Theory and Practice: Procurement of Local and Organic Food in Public Catering Systems. IFSA Conference Proceedings. Retrieved: <https://www.harper-adams.ac.uk/events/ifsa/papers/5/5.9%20Haack.pdf>. Access:10.12.2018.
8. Kopsavilkums par augli skolai programmu (Summary of the School Fruit Programme) (2017). Retrieved: http://www.lad.gov.lv/files/statistika_augli_skolai_25012017_3f2f1.pdf. Access:04.12.2018
9. Kopsavilkums par skolas piena programmu (Summary of the School Milk Programme) (2017). Rural Support Service. Retrieved: http://www.lad.gov.lv/files/statistika_skolas_piens_24012017_65291.pdf. Access:04.12.2018.
10. Latvijas lauksaimniecība (Agriculture of Latvia) (2013). Ministry of Agriculture of the Republic of Latvia. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/29/28/LS_ZINOJUMS_2013.pdf. Access:04.01.2019.
11. Latvijas lauksaimniecība (Agriculture of Latvia) (2015). Ministry of Agriculture of the Republic of Latvia. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/63/66/LS_gadazinojums_2015.pdf. Access:04.01.2019.
12. Latvijas lauksaimniecība (Agriculture of Latvia) (2016). Ministry of Agriculture of the Republic of Latvia. Retrieved: (https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/90/30/fs-01usersLinda.BirinaDesktopAA2016_lauksaimniecibasgadazinojums.pdf). Access:04.01.2019.
13. Latvijas lauksaimniecība (Agriculture of Latvia) (2018). Ministry of Agriculture of the Republic of Latvia. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/01/33/19/Gadazinojums.pdf. Access:04.01.2019.
14. Mikkelsen, B.E., Sylvest, J. (2012). Organic foods on the public plate: technical challenge or organizational change? J. Foodservice Business Res. 15, 64–83.
15. Organic farming statistics (2015). EUROSTAT. Retrieved: http://ec.europa.eu/eurostat/statistics-explained/index.php/Organic_farming_statistics. Access:04.06.2018.
16. Risku-Norja, H., Loes, A.-K. 2016. Organic food in food policy and in public catering: lessons learned from Finland. Org. Agric. pp. 1-14.
17. Sonnino, R. (2009). Quality food, public procurement, and sustainable development: the school meal revolution in Rome. Environ. Planning A 41, pp. 425–440.
18. Sumberg, J., Sabates-Wheeler, R. (2011). Linking agricultural development to school feeding in Sub-Saharan Africa: theoretical perspectives. Retrieved: <https://www.sciencedirect.com/science/article/abs/pii/S0306919211000406>. Access:03.12.2018.
19. Torjusen, H., Sangstad, L., O'Doherty Jensen, K., Kjærnes, U. (2004). European Consumers' Conceptions of Organic Food: A Review of Available Research (Oslo (SIFO), Norway: National Institute for Consumer's Research). <http://orgprints.org/2490/1/haccrapport.pdf>. Accessed 13.09.2017.

TRENDS OF THE PROCES OF MODERNIZATION OF FARMS MANAGED BY YOUNG FARMERS

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Abstract: The paper presents an analysis of the farms manager by young farmers. The research was carried out in 2018 in the Warminsko-Mazurskie Voivodeship and included two groups, including 32 young farmers and 48 farmers aged 40 or over. Participants of the study were farmers who cooperate with the Warmian-Masurian Agricultural Advisory Center and run development farms, with a commodity character of production.

The aim of the research was to find the answer to the question whether young farmers using preferences under the Common Agricultural Policy are more willing than other farmers to modernize the farms which they manage. In the group of young farmers covered by the survey, the average area of farms managed by them was 31.47 ha, while in the case of farmers over 40 years old an average area of their farms was 112.46 ha. Older farmers owned 3.5 times larger farms compared to representatives of the group of young farmers. Young farmers worked on their own, while the older farmers mostly employed hired workers. The modernization of farms was mainly financed by own capital, while all of them, without exception, used the available support for modernization of the farm. Due to the high costs of modernization of production, and above all the necessity to increase its scale by purchasing land, further development of farms run by young farmers will be slow, evolutionary, as was the case for farms run by farmers from the comparative group.

Key words: young farmers, modernization, farm

JEL code: Q12

Introduction

Poland is perceived as a country with great potential for agricultural production. The inclusion of Polish agriculture under the Common Agricultural Policy (CAP) favored and continues to support the processes of its restructuring and modernization (Stankiewicz 2010; Wozniak 2013; Sikora 2014). The possibility of benefiting from co-financing motivates farmers to modernize their farms, thus strengthening their market position (Dziwulski 2013; Tomczyk 2014).

However, in the opinion of many experts, despite the obvious impact of funds from the EU budget on investment opportunities of farms, the scale of impact of these funds on innovation and competitiveness of farms, especially those run by young farmers, has not yet been identified in detail. Although this situation is changing and there are new publications addressing this issue (including: Poczta 2013; Jozwiak, Zietara 2013; *Young farmers'*... 2015; Adamowicz, Szepeluk 2016; Rudnicki *et al.* 2017).

One of the strengths of Polish agriculture is young age of agricultural producers compared to other European countries. In Poland there are 14.7 % of all farmers managing farms who are under the age of 35, while in the EU-27 an average of 53.1 % of farmers are people over 55 (23.5 % - in the range 55-64 years, 29.6 % - over 65 years), and only 24.2 % of owners are under the age of 44 (7.5 % - under 35 years, 16.7 % - in the range of 35-44 years) (Kania 2014). The age of the farmer is a factor that influences the production and economic results as well as the development potential of the farm (Rovný 2016; Rudnicki *et al.* 2017). However, it is difficult to specify the concept of young people / youth and characterize them strictly as a separate category among various other groups and social groups. Young farmers in the EU, under the CAP, are covered by special intervention policy instruments. According to the Regulation of the European Parliament and the EU Council No. 1307/2013 of December 13, a young farmer is a person who has not exceeded 40 years

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of age and starts an agricultural activity or runs a farm for No more than 5 years. Generations of young farmers depend on the possibilities of further agricultural development, including ensuring the continuity of functioning of commercial farms.

Undoubtedly, strengthening the support for young farmers is justified by the greater potential of innovation and entrepreneurship of this group of farmers and their openness to innovation and understanding the need to solve environmental problems. As many researchers have noted, the support of this group of farmers allows to increase the dynamics of the agriculture modernization process and ensure long-lasting, stable development (Kania 2014; Mickiewicz, Mickiewicz 2015; Adamowicz, Szepelek 2016). However, the fundamental question is whether the implemented support mechanisms are effective in solving the problems of young farmers.

At a conference organized by the European Council of Young Farmers (CEJA) in Luxembourg in July 2015, a discussion was held on the prospects for agricultural policy and the main challenges regarding the development prospects of European agriculture were identified, including: increased social expectations towards agriculture (relating in particular to environmental protection, animal welfare, combating climate change) and increased demand for biomass. In 2015, CEJA adopted at the conference in Milan the so-called Young Farmer's Manifesto, which draws public attention to a number of key issues covered in the following areas:

- transition to a circular economy in order to reduce food waste and improve the functioning of the food chain; more fair treatment and protection of food producers,
- strengthening young farmers in the implementation of sustainable development and environmental protection,
- support in the use of innovative solutions that give the possibility of more production with less use of resources,
- enabling young farmers to create new jobs in rural areas and increase their share in building economic growth, including their share in trade (*Young Farmer ... 2015*).

An analysis of family farms shows that young farmers obtain better management results. This is evidenced by the productivity and profitability of all production factors, and especially the indicators referring to the use of labor resources (*Needs of young ... 2014*)

In Poland, young farmers have benefited from support for the start-up of the agricultural activity since 2004. This support is provided as part of the measure which can be generally referred to as a „Premium for young farmers” (the name of the measure differs in particular programming periods). It is also noteworthy that according to the Agency for Restructuring and Modernization of Agriculture (ARMA) data, in 2017 4112 people applied for 100 000 grants for young farmers, which is almost 20 % more applicants than in the previous year (3433 applicants). In view of the above, not only an assessment of the effects of the previously provided support but also the eligibility criteria are of importance (ARMA 2018).

The funds transferred under the CAP have an impact on the level of income from agricultural production (Lorencowicz, Cupiał 2013). Although agriculture is an important link in the agribusiness sector, its share in favor of other sectors of the sector is gradually decreasing. At the same time, this decrease is compensated by the increase in efficiency, management effectiveness as well as the quality of production. The success of agricultural producers is most often defined by the ability to innovate, especially those of a technological and organizational nature (Vilkè *et al.* 2018). Young farmers are more open to new technical, technological or organizational solutions, and are more inclined to realize investments (Mickiewicz, Mickiewicz 2015). For this reason, young farmers are

particularly supported by the EU by means of the Common Agricultural Policy instruments. This also applies to future agricultural policy 2021-2027.

It is young farmers from who efficient farm management is expected. The literature on the subject emphasizes that the succession of generations among farm managers contributes to the improvement of the quality of management processes (Lobley *et al.* 2010; Burton 2012; Dudek 2016; Czekaj 2016). Relatively young age and higher level of professional qualifications of farmers are conducive not only to modernization processes in farms (eg. introduction of innovations, intensification of investment activities), but also to improvement of economic results and environmental sustainability of agricultural activity (Wrzaszcz 2012).

In addition, young farmers are more open to changes in the environment. They can much more easily and more often than other farmers develop and diversify production, but also undertake non-agricultural activities (Meert *et al.* 2005). The production decisions taken, in turn, may affect not only the condition of farms, but also the economic situation of the rural population.

Materials and Methods

Research on the analysis of the development of farms managed by young farmers was carried out in 2018 in the Warminsko-Mazurskie Voivodeship. For comparative purposes, they included selected two groups of farmers, including 32 farmers meeting the EU criterion of „young farmer” and 48 farmers aged over 40. All research participants were covered by agricultural advisory service and managed highly commercial farms. The aim of the research was to answer the question whether young farmers who benefit from preferences under the Common Agricultural Policy are more willing than other farmers to modernize their farms. As research conducted in EU member states shows, a significant percentage of representatives of this group declares their activity regarding the modernization of their own farm (*Young farmers' ...* 2015). Investors are also willing to invest in old age farmers who run development farms. For this reason, a comparison was made between young and old age farmers managing farms recognized as development farms.

The farms were selected using a multi-stage sampling method, namely in the first stage a group of farmers managing highly commercial farms from the database of the European Farm Accountancy Data Network (FADN) have been selected for research, followed by a simple random sampling among units of economic size (turnover in euros) above EUR 25,000, divided into two groups - those managed by young farmers and others. Advisers from the Warmian-Masurian Agricultural Advisory Centre conducted interviews with randomly selected farmers from both groups. The basic research tool was a research questionnaire.

Results and Discussion

Characteristics of the research subjects' farms

Observation of the condition of agriculture in the EU member states indicates that the decisive factor in the nature of production, despite the technological, organisational or biological progress being made, is the agricultural land. Large farms are able to introduce new technologies, improve the system of work organization, enter the food markets. There are in total 65101 farms in Warminsko-Mazurskie Voivodeship, including 64848 farms with crops. The average size of individual farms conducting agricultural activity is 18.40 ha. Against this background, the average area of farms young farmers participating in the study was 31.47 ha, while the area of farms run by other participants in the research, ie farmers over 40 years of age was 3.5 times higher and amounted to 112.46 on average. ha.

In the Warminsko-Mazurskie Voivodeship, in 2013, a total of 59,833 full-time employees worked on the farm, while the total number of employees included the contribution of hired workers, casual employees, contractors and neighborly help. Out of all those employed in private farms the vast majority, as much as 85.7 % was the family labor force (in Poland 91.2 %), while in farms participating in the research of young farmers, the family labor force accounted for 95.2 %, and in the comparative group - 79.4 %. The vast majority of research participants over 40 years of age employed hired workers using various forms of employment.

Animal production is another important area of analysis. Livestock includes: equines, cattle, pigs, sheep, goats, poultry, rabbits, fur animals, bee stumps and other animals kept on the farm for meat production. In the case of agricultural holdings operating in the voivodeship, farm animals were maintained in 53.8 % of individual farms conducting agricultural activity. In this group, 67.14 % of agricultural producers had cattle, and 34.7 % owned pigs. The main production direction in the Warminsko-Mazurskie Voivodeship is plant production. In the case of the surveyed farms managed by young farmers, 4 out of 32 farms owned dairy cattle (12.5 %), beef cattle in 8 farms (including 2 that also deal with milk production), and another 2 farms of young farmers (12.5 %) specialized in sheep production. The remaining 62.5 % of the farms of young farmers participating in the research specialized in crop production, mainly cultivating cereals and rapeseed. On the other hand, in the case of the group of older farmers covered by the research, who run a development farm, 4 out of the 48 farmers participating in the study were involved in the production of milk (8.3 %). There were three farmers in this group who also conducted cattle fattening. Another 3 farmers specialized in the production of pigs. 85.4 % of representatives of this group of agricultural producers specialized in plant production. As it can be seen, farmers of old age withdrew from intensive animal production for much easier to manage plant production. As for the structure of crops, next to the production of cereals and rapeseed, a significant area was occupied by legumes and maize. Generally, owners of development farms much more often specialized in crop production than an average individual farmer from the territory of the Warminsko-Mazurskie Voivodeship.

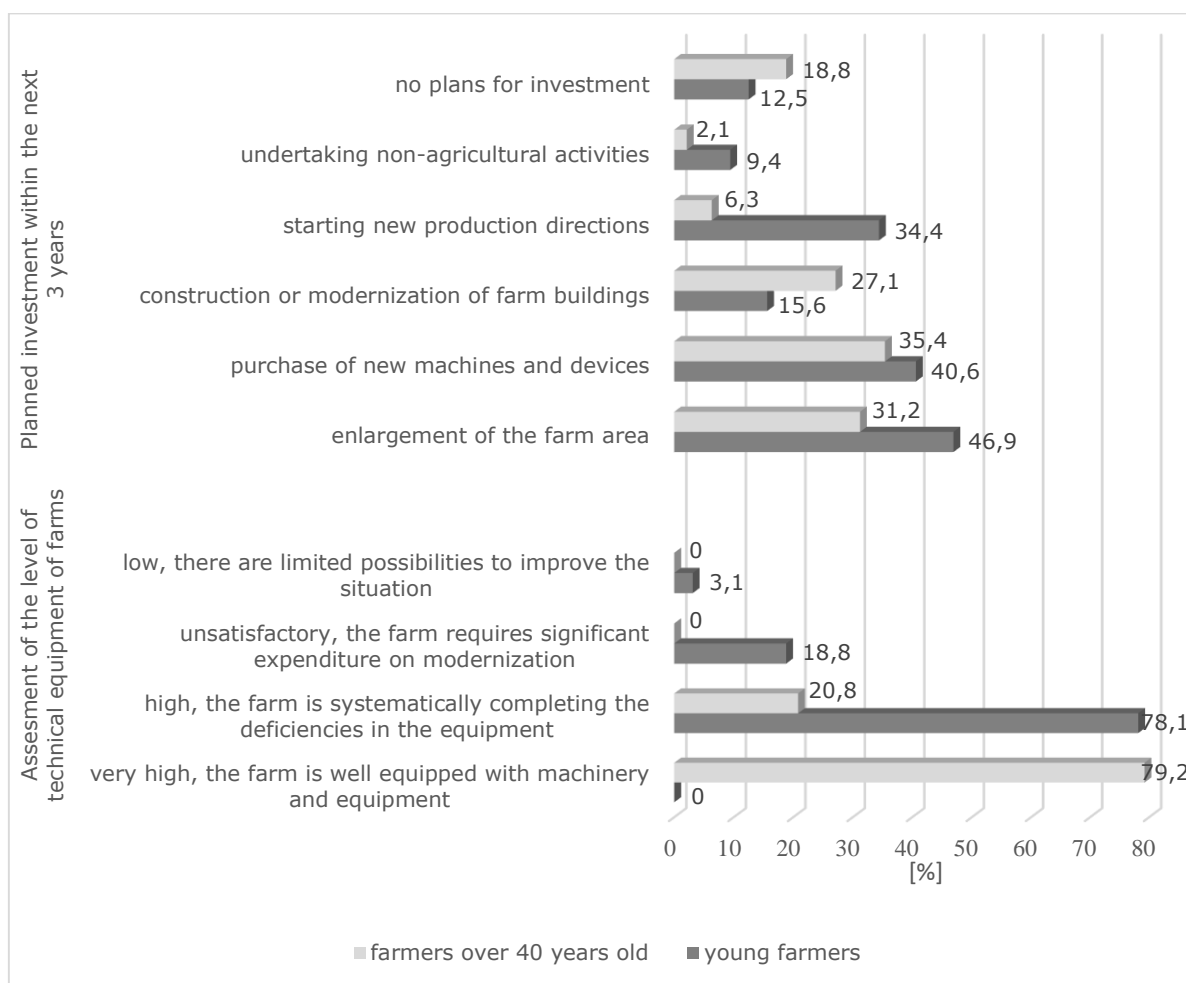
While in the case of young farmers, none of them declared to have sources of income outside the farm, in the case of older farmers, non-agricultural activities were conducted by every fourth farmer. Non-agricultural activities related to the supply of agricultural products, services for agriculture and agricultural produce processing were thus related to the agribusiness sector.

Sources and possibilities for modernization of development farms

Young farmers who participated in the research were asked to assess the situation regarding the level of technical equipment of farms managed by them. The opinion that the current state of equipment is good, with farms needing further modernization, was expressed by $\frac{3}{4}$ representatives of this group of respondents. The others assessed the condition of their farms as unsatisfactory, however, declaring that they would undertake modernization activities in the future. Young farmers, who rated the level of technical equipment relatively low, owned the smallest farms (with an area from 14.8 ha to 26.0 ha). In the comparative group, which included farmers over 40, 38 respondents (79.2 % of representatives of this group) considered that the current level of technical equipment of their farms is very high, and in their statements they declared that they are still looking for more innovative solutions. The remaining representatives of this group of farmers assessed the level of technical equipment of farms as high, and in the planned activities they will gradually complement the deficiencies in the equipment (Figure 1). Higher grades regarding the level of technical equipment

of farms indicated by farmers aged over 40 are mainly correlated with a larger scale of production in these farms. As it can be seen, farmers, both young and older who managed commodity farms are characterized by a high propensity to undertake new investments.

The information obtained during the interviews allows to state that all young farmers participating in the research have benefited from EU support sources available for this group. Farmers representing the comparative group also in the past used the resources of the Rural Development Program aimed at modernization activities. Currently, the main source of financing new investments are mainly farmers' own funds and loans.



Source: author's survey

Fig. 1. **Evaluation of farm equipment in technical equipment and planned investments in farms of the farmers covered by the research**

Optimistic assessments, made by farmers, of the level of technical equipment of farms managed by them were verified by asking them about planned investments within the next 3 years, which may contribute to the improvement of management efficiency. The statements of the research participants, especially young farmers, show that one of the basic conditions for increasing the efficiency of farming is enlarging the farm area. Such plans within the next 3 years were declared by every second young farmer (46.9 %) and every third farmer from the comparative group (31.2 %). The next plans indicated by the research participants concerned the purchase of new machines and devices, which were declared by 40.6 % of young farmers and 35.4 % of farmers in the comparative group respectively. 27.1 % of farmers aged over 40 and 15.6 % of young farmers planned to build or modernize their farm buildings. Young farmers were interested more often than others in starting new production lines (including, among others, vegetable growing, growing energy crops, etc.). It

was noted that 12.5 % of young farmers and 18.8 % of the remaining respondents did not intend to invest in the modernization of their own farm in the coming years. It is significant that a small percentage of a young farmers, however, almost three times higher than in the group of farmers over 40 years of age, included non-agricultural activities in their potential decisions regarding modernization of (Figure 1). It should be noted, that during the time of the research, every fourth farmer aged over 40 had already conducted non-agricultural activities, while in the group of young farmers there were No such people.

One of the main barriers to the modernization of farms run by young farmers turned out to be the high costs of necessary investments, as well as the current financial situation (repayment of outstanding loans, relatively low revenues). For these reasons, even when obtaining subsequent tranches of support from the EU budget, the development of farms run by young farmers will be of an evolutionary nature, similarly as it was in the past in the case of farms run by farmers from the comparative group. As it was observed, one of the basic barriers limiting the further development of farms run by young farmers is the relatively small farm area (about 2 times bigger than the average area of individual farms in the region and 3.5 times smaller than the average area of farms run by farmers after 40). Agricultural land takeover by young farmers is constricted by the lack of appropriate national support mechanisms. There were frequent instances of informal, and therefore not included in the presented research results, land rent by young farmers. This phenomenon means that the agricultural land area owner receives subsidies, while the young farmer uses the land without paying the rent. In such cases, the young farmer does not show the actual area on which he runs agricultural activity, which makes it difficult, for example, to obtain a loan for the purchase of machinery and equipment.

Research participants aged over 40, when asked to indicate the main barrier to farm modernization, mostly pointed to the instability of prices for agricultural products (91.7 %). As it can be seen, the two compared groups of farmers are characterized by a significant difference regarding both the current economic situation of farms and priorities.

Conclusions

Agriculture is an important sector of economic activity of the inhabitants of the Warminsko-Mazurskie Voivodeship. The economic and social significance of agriculture has always been strategic in this region of Poland, not only because of the place and nature of the work, but also its role in the rural space and its strong impact on other types of economic activity of the inhabitants. The favorable agrarian structure, compared to other provinces in the country, and the concentration of production in larger farms in terms of area favors the commodity character of production.

Research shows that young farmers are gradually raising the level of technical equipment of their farms. The most frequently investments indicated as priority include land purchase, purchase of new machines and equipment, and new production directions. Investment in the modernization of production technologies, which can contribute to strengthening the position of agricultural producers in the food supply chain, should be considered the most effective. All farmers participating in the research (both young and the remaining) were willing to use every available opportunity to obtain external financial support.

Due to the limited access to financing sources, there is a need to introduce additional support mechanisms for the development of commercial farms run by young farmers. This support may be of a non-financial nature and may include, inter alia, undertaking counseling activities to improve

management efficiency, organization and planning of production in order to encourage farmers to cooperate. The effectiveness of the solutions indicated here depends, however, on the involvement of farmers, their need for action, ingenuity and diligence.

Observation of the situation in both Polish and European agriculture allows to conclude that the main character of the farms owned by young farmers is mainly determined by the available land resources. Bigger farms in terms of area are able to introduce modern technologies, improve work organization, enter new markets.

Due to the fact that young farmers are becoming one of the strategic groups of functioning and development of the whole agribusiness sector, supporting them has a positive impact both on the multifunctional development of rural areas and on the social situation of the rural population.

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Bibliography

- Adamowicz M., Szepeluk A. (2016). *Support to Young Farmers as Part of Agricultural Policy of the European Union*. Zagadnienia Ekonomiki Rolnej, 3(348), 106-128. DOI: 10.5604/00441600.1218186.
- Burton R., Fischer H. (2015). *The succession crisis in European Agriculture*. Sociologia Ruralis, Vol. 55, No 2, 155-166.
- Czekaj M. (2016). *Selected problems of succession of farms in Poland*. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 439, 77-89.
- Dudek M. (2016). *The succession of individual farms as a factor of structural transformation in Polish agriculture*. Studia i Monografie 170, IERiGŻ-PIB, Warszawa, pp. 177.
- Dziwulski M. (2013). *Investment Activity of Polish Agricultural Holdings in 2010 in Terms of their Economic Size*. Zesz. Nauk. Uniw. Szczec. Finanse. Rynki finansowe. Ubezpieczenia, 59, 481-490.
- Felczak T. (2014). *The impact of the economic size and farming type of agricultural farms on nature of liquidity strategy*. Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 804, Finanse, Rynki Finansowe, Ubezpieczenia, No 67, 201-210; www.wneiz.pl/frfu.
- Jozwiak, W., Zietara, W. (2013). *Kierunki i zakres wsparcia inwestycji w polskich gospodarstwach rolnych w latach 2014-2020. [Directions and scope of investment support in Polish farms in 2014-2020]*. Zagadnienia Ekonomiki Rolnej, nr 1(334), 42-58.
- Kania J. (2014). *Young farmers in family farms of the European Union*. Problems of Small Agricultural Holdings, No. 3, 35-50.
- Lobley M., Baker J.R., Witehead I. (2010). *Farm succession and retirement: some international comparisons*. Journal of Agriculture, Food Systems and Community Development, vol 1(1), 55-64.
- Lorencowicz E., Cupial M. (2013). *Assessment of investing activity of farmers using the EU funds on the example of Lubelskie Voivodeship*. ACTA Sci. Pol., Oeconomia, 12(1), 19-24.
- Meert H., Van Huylenbroeck G., Vernimmen T., Bourgeois M., van Hecke E. (2005). *Farm household survival and diversification on marginal farms*. Journal of Rural Studies, 21, 81-97.
- Mickiewicz A., Mickiewicz B. (2015). *The process of supporting Young farmers in Polish agriculture*. Problems of Small Agricultural Holdings, 3, 67-81.
- Needs of young farmers. Report I of the Pilot project: Exchange programmes for young farmers Final*. (2015). European Commission, Directorate-General for Agriculture and Rural Development, Brussels.
- Począta W. (2013). *Agricultural holdings in Poland against the background of EU farms - the impact of the CAP*. Powszechny Spis Rolny 2010, GUS, Warszawa.
- Rovný P. (2016). *The analysis of farm population with respect to young farmers in the European Union*. Procedia – Social and Behavioral Sciences 220, 391-398.
- Rudnicki R., Dubownik A., Szyda B. (2017). *European Union Support for Young Farmers and Managers of Agricultural Holdings Age Structure in Poland*. Komitet Przestrzennego Zagospodarowania Kraju PAN, No 267, 50-69.
- Sikora J. (2014). *The modernization of Polish farms assisted with the EU Funds under measure 121. of Rural Development Programme 2007-2013*. Roczniki Naukowe SERiA, t. 16, z. 6, 438-443.
- Stankiewicz D. (2010). *Impact of EU Accession on Modernization of Polish Agriculture*. Studia BAS, No 4(24), 217-245.
- Tomczyk A. (2014). *Technical modernization in the farm south Poland*. Acta Sci. Pol., Technica Agraria, 13(1-2), 49-55.

20. Vilkė R., Vidickienė D., Gedminaitė-Raudonė Z. (2018). *Innovating apart of together: Lithuanian farmers and rural communities*. Research for Rural Development 2018, vol. 2, 160-166, DOI: 10.22616/rrd.24.2018.067.
21. Wozniak M.G. (2013). *External Conditions of Modernization of Polish Economy and Socio-Economic Cohesion*. Wyd. Uniwersytetu Rzeszowskiego, No 30, 71-89.
22. Wrzaszcz W. (2012). *The Sustainability of Individual Holdings in Poland on the Basis of FADN Data*. Studia i Monografie 155, IERiGŻ-PIB, Warszawa.
23. *Young Farmer Manifesto Ceja*. (2015). The European Council of Young Farmers, 2015.

MAIN DRIVERS OF CENTRAL AND EASTERN EUROPEAN COUNTRIES' AGRICULTURE IN 2005-2013: SPECIALIZATION AND LAND CONCENTRATION

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Abstract. The paper deals with growth and productivity advantages of specialized farms by physical size in EU10 (Central and East European Countries, CEECs) and makes a comparison between EU10 and EU27/15 average using EUROSTAT data in the period of 2005-2013. Focus is given to exploring the level and development of such indicators as change in number of specialized farms, land (Utilized Agricultural Area, UAA) and labor (Agricultural Work Unit, AWU) use on input side; average farm size by land and labor use. On output side area, labor and total productivity were analyzed. Paper gives a dynamic analysis of all these indicators pointing out what farm sizes give a more stable ground for increasing growth and productivity at a higher speed supporting to improve competitiveness of CEECs' agriculture. It was concluded that specialization in farming in EU10 offered a more survival path having physical size bigger than non-specialized farms and, in relative term, pushed less labor out from the sector than non-specialized farms did. Specialized farms in EU10 have increased both labor and area productivity at a higher speed than non-specialized farms in all three productivity indicators except in Poland where it was opposite and, in Estonia in total farm output. Largest specialized farms more than doubled production in 7 out of EU10.

Key words: EU agriculture, specialization, farm size, productivity, CEECs.

JEL code: Q18

Introduction

Concerning EU farm structure, significant changes have taken place in member states and it has been more so in EU10 since EU Eastward enlargement. Within the EU, however, the dynamics of development paths of agriculture in old (EU15) and new member states have been different by production structure, specialization and farm size. The paper gives focus on how much extent the advantages of specialization and economic of scale helping EU10 agriculture catching up over a decade after EU Eastward enlargement. Analysis of growth of farms of 10 specialization types and 5 farm categories by land size was made and, results were compared to EU27/15 average at country and farm category level.

1. Literature review

Tangermann (1994) made even professionals surprised with his vision: „The structural changes ... going on in Central Europe's agriculture, both on farms and in upstream and downstream sectors, are shaking the foundations of decision-making and economic activities...” and added „Agricultural policy 'reforms' in western countries are nothing compared with the fundamental upheaval occurring in Central Europe...” (Tangermann, 1994, pp. 375- 392).

Forgacs (2002) pointed out agriculture output of CEECs declined by 20 up to 60 percentage in 1993-1994 compared to production level prior to radical reforms. In 2000 small (individual) farms cultivated 80 % or more of the land in Baltic states, Poland, Slovenia and Romania. On the other end around three quarter of land was in the use of large farms with a highest average of farm size in Slovakia (1360 ha), followed by Latvia (1135ha) Czech Republic (998 ha) and Hungary (960 ha).

The role, importance, development and policy aspects of small farms has always been in focus pointing out how the CAP tried to give help or, what weaknesses of CAP had in its policy to small farms (EP resolution, 2014; Davidova S,-Bailey A, 2014; Dwyer J, 2014; Davidova S, 2014). At the same time, it has been emphasized that small farms have to make changes in farming methods in order to have a successful adjustment concerning their possible integration into modern food chains (Csaki C, – Forgacs C, 2008; Gordon M. et al., 2014; Rabinowitz E, 2014). Social capital aspects of

small farms have also been investigated (Wolz A. et al., 2010). Structural change of Semi-Subsistence Farms (SSFs) in New Member States (NMSs) was discussed from agricultural policy point of view (Erjavec E. et al., 2014). The role and dynamics of small farms in rural development was analysed in a study focused on Romanian agriculture (Popescu D-L, 2014). Between 2005 and 2013 as many as 2.38 million farms (27.7 %) disappeared in EU10, 86.5 % of which had UAA below 5ha bringing deepening poverty in many rural areas. However, in general the specialization aspect of farms in the EU10 has not received much attention from researchers until more recently.

Forgacs (2016) found that, although, both area and labor productivity grew faster in non-specialized small farms, but growth in total productivity achieved by small specialized farms has exceeded that of non-specialized ones. Farm output of specialized farms (both small and non-small) have exceeded that of non-specialized farms both in 2005 and 2013 (Forgacs, 2017). Csaki C. – Jambor A. (2018) carried out a research on convergence of CEECs' and Countries of Independent States (CIS) between 1997-2000 and 2013-2016. Conclusions were rather different and not convincing concerning catching up of CEECs' agriculture, although, in some extent such convergence in EU agriculture was pointed out.

In Farm Structure Survey 2013 it was underlined „... across the EU-28 in 2013, smaller farms (in economic terms) tended to practice a range of different activities on the farm, ... When they did specialize in a single type of farming this tended to be either pig or poultry farming, or the production of permanent crops (especially olives). Larger farms were more likely to specialize in a particular type of farming, especially horticulture, dairy farming, pig farming and cattle rearing.” EUROSTAT (2016). Monitoring farm structure development TEAGASC has developed a series of National Farm Surveys for Ireland since 2010 in order to point out achievements and possible weak points of Irish farm structure development and, generating feedback for agricultural policy makers (ISSDA 2018). In 2016, DG Agriculture organized a workshop focusing on farm structure development of EU agriculture on how Common Agricultural Policy (CAP) can support a 21st century European model of Agriculture. It underlines that decline in number of farms was less in EU10 compared to EU15, and decline of small farms shows big differences in EU10 countries. (DG Agriculture, 2016). Mizik (2019) pointed out that CAP reforms resulted in increasing land concentration in EU10.

Research questions are as follows: How much extent catching up of EU10 agriculture to EU27 was achieved after one decade joining EU? What is the role of concentration and specialization to reach higher dynamics of output in EU10 agriculture? How strong is the relationship between specialized farm size and growth in EU10? How much extent the catching up of EU10 agriculture was a universal phenomenon in EU10 countries? How much extent the growth of area, labor and total productivity in EU10 have supported catching up of EU10 agriculture?

2. Methodology

To obtain a deep insight into farms' performance from a specialization and farm size perspective point of view, EUROSTAT data set of 2005-2013 was used for analysis. Besides the structural development of specialized farms their labor use (AWU), land use (UAA) and production (Standard Output, SO) were analyzed. Such indicators as growth of area, labor and total productivity of farms were calculated. The performance of specialized farms was compared to that of non-specialized ones

and, analysis of their growth provides insight into the pattern of farms' development in 10 specialized farm types¹, in five different farm size categories in EU10.²

This is the first time that specialization of farms in the EU10 has been analyzed by farm size and, results were compared to both EU27/15 average and that of non-specialized farms of the EU10 pointing out what advantages of specialization and farm size have had over a one decade adjustment in EU10.

3. Research results and discussion

Increasing share of number of specialized farms

After a deep decline, still as many as 10.7 million farms worked in EU27 in 2013 in compare with 14.5 million of 2005. 58 % out of which went to EU10 with a decline exceeding EU27 average. 46.2 % of farms were specialized in EU27 and 44.7 % of it belonged to EU10 having one specialized farm in every three. Decrease of number of specialized farms in EU15 (19.5 %) exceeded that of EU10 (15 %). Decline of specialized farms in EU10 from 2005 to 2013 took place in all CEEs in farm size with UAA less than 5ha. The picture of EU15 is total different as the number of specialized farms increased in one farm size category only (UAA 100 ha and above) and declined in all others. Only the largest specialized farms in EU15 found land (UAA) concentration as a way of farm growth while, in contrast, in EU10 apart from small farms (below 5ha) in all farm size categories the land concentration has increased. Dynamics of specialized farms in EU10 varied by country and by farm size very much. The level of increase of number of specialized farms in different farm size with UAA 20ha and above in EU10 varied between 7.4 % in Estonia (50-99.9 ha) and 300 % in Slovenia (100 ha and above). Between 2005 and 2013 the bigger the specialized farm size by land from 20 ha and above, the higher the growth of number of specialized farms can be observed in 7 out of EU10.

Concentration of land use in specialized farms

Specialized farms found extending land area as a path of increasing competitiveness in EU27 having total 9.4 million UAA (54.1 %) in 2013. Of which small farms below 5ha had a share of 7.4 % in EU10 and only 3.8 % in EU15. However, these figures in case of farms with UAA of 50ha up to 99.9ha was 8.5 % in EU10 and 21.4 % in EU15. Largest farm extended their field at a higher speed and use more than half of land of specialized farms total in EU27. Specialized farms increased their UAA significantly in EU10 and the average land use of largest specialized farms in EU10 already exceeded that of EU15 in 2013.

Specialized farms slow down pushing labor out of agriculture

In EU27 9.3 million AWU was used in 2013 showing a decline by 25.1 % from 2005, more in EU10 (29.6 %) and less in EU15 (19.7 %). In 2013 small farms below 5ha used 55.5 % of labor in EU10 while it was only a bit over one quarter in EU15. Labor concentration in largest farms with land 50ha and above allowed to offer much less jobs in total in EU10 (10.8 %) compared to EU15 (30.7 %). In 2013 labor use of specialized farms by farm size was similar to that of non-specialized ones in EU15, but it was different in EU10 where big specialized farms with UAA 20ha and above used 26.6 % of labor, while in total farms the relevant figure of this farm category amounts to 17.7 % only. Decline

¹ The following specialized farm types give the basis for analysis: 1. Specialized in cereals, oilseed and protein crops. 2. Specialized in horticulture indoor. 3. Specialized in horticulture outdoor. 4. Specialized in vineyards. 5. Specialized in fruit and citrus fruit. 6. Specialized in olive oil. 7. Specialized in dairy farming. 8. Specialized in cattle-rearing and fattening. 9. Specialized in pig production. 10. Specialized in poultry production.

² 1. below 5 ha (UAA), 2. 5-19.9 ha, 3. 20-49.9 ha, 4. 50-99.9 ha and 5. 100 ha and above.

in labor use of specialized farms was more differentiated between farm size categories in EU10. It is a general phenomenon that specialized farms pushed out much less labor from 2005 to 2013 in all farm sizes compared to total farm average both in EU10 and EU15. Apart from very small farms (below 5ha) all specialized farms in all farm size categories used more labor in EU10 in 2013 than in 2005. Such increase in labor use was only observed in the biggest farm size in EU15. In EU10, meanwhile farms total had around 30 % less labor in 2013 in compare to 2005, the decline of labor use was only 5.7 % in case of specialized farms. In EU10 specialized farms significantly slowed down the process of pushing labor out from the sector but the picture within EU10 varies. In three countries (Poland, Hungary and Czech Republic) specialized farms absorbed more labor in 2013 than in 2005. Poland is the only country in EU10 where specialized farms in all farm size categories used more labor in 2013 compared to 2005.

Growth of production

EU27 increased production from 2005 by 14.9 % reaching 329 billion EURO in 2013. Growth of production was higher in EU10. Poland with highest agricultural potential has reached significant growth (28.9 %), while the lowest figure went to Romania (7.9 %). Speeding up of CEECs agriculture production based more on growth of specialized farms (70.4 %) well above EU15 average (17.5 %). Output of specialized farms more than doubled in Latvia, Bulgaria and Slovakia. In 5 out of EU10 share of specialized farms in Standard Output is above 60 % headed by Bulgaria 68.8 %. In total farms, Slovenia was only able to increase output in farms below 5ha. However, in farm category between 5.00-19.9ha there have been already 5 countries producing more in 2013 compared to base year. The bigger the farm size the higher the growth rate of farms total output in CEECs.

Higher speed of production growth of specialized farms reflected in the figures in smaller farm categories, too. Even in smallest farms below 5ha 5 countries out of EU10 had higher output in 2013 than in 2005. The higher growth produced by Slovenia (29.4 %). In farm category of 5-19.9 ha of specialized farms, apart from Estonia and Lithuania, in all CEE countries the production went up. Farms with UAA 50-99.9ha 7 CEECs more than or, almost doubled their output headed by Slovenia (300.8 %). While in farms 100ha and over already 8 countries reached high growth including 4 countries where production was tripled or was close to it. Latvia is the leading with 390.4 % followed by Lithuania (335.4 %) and Slovenia (315.8 %). Concerning specialized farms total 4 countries doubled Standard Output or was close to it. According to analysis *the bigger the farm size by land the higher the growth in production achieved*. Within that *specialized farms performed a more dynamic production development compared to non-specialized farms*. Increasing farm size and shifting towards specialization gave the path for farm development and creating basis for EU10 farms for catching up.

Changes in farm size

Land use (UAA/farm)

Average farm size by UAA has gone up in EU27 since EU Eastward enlargement till 2013 from 11.9 ha to 16.2 ha. EU10 has an average farm size half of that of EU27 which ratio practically has not changed. In 2005 specialized farms average by UAA exceeded that of total farms in all EU10 (with the exception of Czech Republic) by 30.9 %. In Bulgaria specialized farms had almost three times more land than total farm average, and it is more than double in Estonia. In 2013, relative size of specialized farms in total farm average by land has become even bigger in all CEECs except in Czech Republic. Looking at increase in average farm size by farm categories it took place mostly

in all farm categories except the largest one but not in all EU10. E.g. the average farm size of small farms below 5ha declined in Romania (20.1 %) and Slovenia (8.1 %), that of largest farms (100 ha and above) increased only in 3 countries (Latvia, the Czech Republic and Bulgaria) but declined in Slovenia significantly (47.8 %). In 2013, land concentration in specialized farms went up and reached a level higher than that of total farm average in all CEECs except in Czech Republic

Average farm size by land (total and specialized) of EU10 scattered by countries from few hectares up to 120-130 ha, however, that of specialized farms exceeds farms total average in all CEECs except in Czech Republic where, otherwise, both average of total and that of specialized farms are the highest (above 120ha) within EU10 member states.

Labor use (AWU/farm)

Average AWU used by farms practically has not changed between 2005 and 2013. In 2013 still, it was 0.9 AWU in EU27, 0.8 in EU10 and 1.0 in EU 15 indicating farms in average did not find absorbing more labor as source of farm growth. Farms in EU10 used more labor in all farm categories than EU27 average both in 2005 and 2013 except in farms with UAA less than 5 ha, indicating production in larger farms is more labor intensive compared to that of EU 15. Specialized farms used less labor compared to total farm average in 8 out of EU10 in 2005 while it was lower only in 6 countries in 2013. In Slovakia, Poland and Hungary farms in general used significantly more labor in 2013 compared to 2005 while EU10 average decreased.

Specialized farm in EU10 increased labor use by 10.9 % headed by Slovakia (67.6), followed by Poland (49.3 %) and Hungary (47.5 %). Hungary used more labor both in 2005 and 2013 in all specialized farm categories except in the largest ones.

Economic/productivity indicators

Area productivity (SO/UAA): In 2005, farms in EU27 produced 1664 EUR/ha in average and gradually increased reaching 1902 EUR in 2013. Area productivity of farms of EU10 compared to EU27 average were 54.1 % and 58.2 % respectively. Small farms below 5ha used land extension for increasing output more intensively than larger farms and had the highest per hectare output between farm categories in each CEECs both in 2005 and 2013.

Small farms produced some 50 % more output per hectare than total farm average in 2005 and even a bit more than that in 2013. In the Czech Republic small farms below 5ha doubled area productivity from 2005 reaching 7015 EUR in 2013. Although, per hectare output of specialized farms total was a bit below the total farm average, however, in case of small specialized farms below 5ha this figure was 21 % higher than total farm average. E.g. in 2013 per farm output of small specialized farms in the Czech Republic exceeded 12200 EUR and, approaching 4000 EUR in Bulgaria and Slovakia contributing total specialized farm average of EUR 1060 in EU10. Farms of EU10 in total produced 19 % more per hectare in 2013 in comparison to 2005 showing a higher growth in farm categories with UAA 20 up to 99.9 ha. The growth in area productivity was higher in specialized farms (26.1 %) with a tendency the bigger the farm size the higher the growth in area productivity. Most of largest farms (100 ha and over) in EU10 could increase per hectare output at the highest level e.g. in Bulgaria (79 %), Latvia (79.5 %) and Slovakia (69 %). However, the highest growth of area productivity in Slovakia was achieved by farms with UAA 5-19.9 ha (115.4 %) and in Romania by farms with 50-99.9 ha (64.2 %).

In 2013, specialized farms of EU10 compared to total farm average have a little advantage concerning per hectare output. However, per hectare output of specialized farms was below national

average in the Czech Republic, Hungary, Romania and Slovakia. In EU10 area productivity of non-specialized farms exceeded that of specialized ones in the two largest farm categories (50-99.9 ha and 100 ha and over). Although, specialized farms have reached more progress in catching up the distance between EU10 and EU27 average it is still higher in case of specialized farms than total ones (51 % and 43.4 % respectively).

Labor productivity (SO/AWU): In 2005 in EU27 one AWU was used to produce almost 23 thousand EURO output which went up by 53.4 % to over 35 thousand EURO in 2013. EU10 had a much lower basis of labor productivity in 2005 (6300 EUR) but it increased faster (80 %) having per AWU output over 11 thousand EURO in 2013. Both in 2005 and 2013 it is a general picture that the bigger the farm size the higher the labor productivity in all EU10 countries with few exception in Hungary in 2005 and, Slovenia and Slovakia both in 2005 and 2013 in case of largest farms (100ha and above) and, in the Czech Republic (5-19.9ha) in 2005. *In case of specialized farms the bigger farm size means a higher labor productivity across all EU10 countries and all farm categories both in 2005 and 2013 with only one exception of Slovenia in largest farms both in 2005 and 2013.*

Labor productivity of EU10 has approached that of EU27 both in specialized and non-specialized farms, however, the distance between EU10 and EU27 declined more in case of specialized farms and less in total farm average. Larger specialized farms (50 ha and over) in CEECs had already reached the same distance to EU27 average as it can be observed in case of non-specialized ones. In 2013 labor productivity of specialized farms exceeded that of total farms in all EU10 countries resulting in 43.9 % growth at EU10 average level. However, the picture varies to some extent according to farm size and country. Level of labor productivity is generally higher in specialized farms across EU10 and all farm categories, however, the growth rate of labor productivity shows different picture by farm size. In CEECs in all 5 farm categories there are minimum one country (in 4 categories minimum 3 countries) where growth of labor productivity of non-specialized farms exceeded that of specialized ones.

Total farm productivity (SO/farm): Farm production average in EU27 amounted to 19.8 thousand EUR in 2005 which went up to 30.8 thousand EUR in 2013. This figure also increased significantly in EU10, however, its level approached still only 30 % of EU27 average. *The bigger the physical farm size of farm the narrower the distance in per farm output between EU10 and EU27.* The distance declined over time only a little in small farms but more in larger farms. Even, in largest farm category (100 ha and above) per farm output of EU10 exceeded that of EU27 average while in farms with land 20.0– 99.9 ha EU10 average was only above half of that of EU27 in 2013.

Comparative analysis of dynamics of productivity indicators

The distance of area, labor and total productivity of farms between EU10 and EU27 was substantial in 2005. Since Eastward enlargement CEECs started to catching up. Dynamics of productivity indicators of EU10 well exceeded that of EU15 average.

As far as growth of area and labour productivity are concerned, specialized farms in EU10 show higher dynamics compare to non-specialized farms. However, due to land concentration and increase of both area and labour productivity, total productivity of all farms of EU10 increased by 68.9 %, above EU15 average while in case of specialized farms it was 100.4 % and 48.5 % respectively (Table 1).

Table 1

Dynamics of productivity indicators of farms total and specialized farms with UAA, % (2013/2005)

Country	SO/UAA		SO/AWU		SO/Farm	
	total	spec	total	spec	total	spec
Bulgaria	84.0	138.7	283.1	299.5	304.5	350.8
Czech Republic	122.2	127.1	171.3	176.0	190.4	212.7
Estonia	121.3	126.5	241.8	221.7	207.0	205.0
Latvia	149.2	154.7	277.3	289.2	261.3	296.5
Lithuania	117.5	120.7	185.9	212.9	177.3	210.2
Hungary	107.4	114.8	125.6	139.7	171.4	206.0
Poland	132.0	125.2	153.5	144.1	223.6	215.1
Romania	114.9	126.9	180.0	221.7	124.7	170.5
Slovenia	118.7	120.7	136.5	151.5	126.7	142.6
Slovakia	135.5	156.2	268.1	313.2	413.0	525.0
EU 27	112.8	108.5	152.0	139.0	153.2	148.5
EU 10	119.0	123.9	174.9	180.7	168.9	200.4
EU 15	112.3	110.9	140.1	138.8	147.1	146.0
EU 10/EU 27	105.6	114.3	115.1	130.0	110.3	135.0
EU10/EU15	106.0	111.8	124.8	130.1	114.8	137.2

Source: author's calculation based on EUROSTAT data

The picture is varied by country. In Poland, higher growth in all 3 indicators went to non-specialized farms. The distance of productivity level between EU10 and EU15 has been narrowing but it is still a challenge for CEECs to continuing catching up.

Conclusions

- 1) Production of EU27 increased from 2005 to 2013 by 14.9 % and by 26.7 % in EU10. Number of specialized farms declined in EU10 but to a less extent than that of EU27. Number of specialized farms in all farm categories from 20ha and up increased in more CEECs.
- 2) With few exceptions, the larger the specialized farm size by land, the higher the dynamics of output across EU10 countries. In contrary to EU27, the number of specialized farms has increased in more EU10 countries concerning farm categories with UAA 20 ha and above.
- 3) Concerning decline in labour use, specialized farms pushed out less labour from the sector compared to total farm average from 2005 to 2013 and it was less in EU10 in average than that of EU27.
- 4) Concerning output of specialized farms, EU10 had a share of 36.8 % in 2005 but it went up to 49.5 % in 2013, nevertheless it is still below the EU27 average (61.4). Largest specialized farms more than doubled output in 7 out of EU10 countries.
- 5) On average, area, labour and total productivity in specialized farms at EU10 level have achieved higher growth than non-specialized farms in all EU10 countries apart from Poland and so in case of total productivity in Estonia. Per farm output was doubled in specialized farms in EU10 well above that of total farm average (68.9 %).

- 6) Between 2005 and 2013 labour productivity both in total and specialized farm average more than doubled in Bulgaria, Estonia, Latvia and Slovakia and, it was also so in Romania and in Lithuania in case of specialized farms.
- 7) Results of catching up of EU10 agriculture has been significant between 2005 and 2013 and the main drivers of such development have been the increasing level of land concentration and specialization; and within that, the engine was the group of specialized farms and more of larger ones.

Bibliography

1. CAP Reform. (2003). Source: <http://www.oecd.org/tad/32039793.pdf> Retrieved:12.03.2018.
2. Csaki, C. – Jambor, A.: (2018). Konvergencia vagy divergencia? Merre tart Kelet-Közép-Eropa és a FAK mezőgazdasága? (Convergence or divergence? Where to heading Agriculture of CEECs and CIS?). Budapest. Kozgazdasági Szemle. LXV. evf., 2018. October (pp. 1048–1066).
3. Csaki, C.–Forgacs, C. (2008). Smallholders and Changing Markets: Observations on Regional level. Society and Economy. Vol. 30, number 1. June. pp. 5-28.
4. Davidova, S. (2014). Small and Semi-Subsistence Farms in the EU: Significance and Development Path. EuroChoices. Vol. 13, number 1. pp. 5-8
5. Davidova, S. and Bailey, A. (2014). Roles of Small and Semi-subsistence Farms in the EU. EuroChoices. Vol. 13, number 1. pp. 10-13
6. DG Agriculture (2016): Research for Agri Committee – Structural Change in EU Farming: How can the CAP support 21st Century European Model of Agriculture?
[http://www.europarl.europa.eu/RegData/etudes/STUD/2016/573428/IPOL_STU\(2016\)573428_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/573428/IPOL_STU(2016)573428_EN.pdf)
 Retrieved:12.03.2018.
7. Dwyer, J. (2014). CAP Reform Proposals for Small and Semi-Subsistence Farms. EuroChoices. Vol. 13. number 1. pp. 31-34
8. Erjavec, E. - Falkowski, J.- Juvancic, L. (2014). Structural Change and Agricultural Policy for SSFs: a View from the 2004 NMSs. EuroChoices. Vol. 13, number 1. pp. 41-44
9. EUROSTAT (2016) Small and large farms in the EU - statistics from the farm structure survey.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Small_and_large_farms_in_the_EU_-_statistics_from_the_farm_structure_survey. Retrieved: 12.03.201
10. Forgacs (2002): The Challenge of Integrating CEECs' Agriculture into the EU. Presidential Address. Xth Congress of EAAE. Zaragoza. August.
11. Forgacs, C. (2016): Is Specialization a Way for small Farms to Adjust in CEE (EU-10). Economic Science for Rural Development 2016. Jelgava. April 21-22. Proceedings. No 42. Pp-221-227
12. Forgacs, C. (2017): Growth and Productivity Advantages of Specialized Farms in Central and Eastern European Countries in 2005-2013 (2017). Acta Aeoconomia. 2017.1. ISSN 1644-0757. ISSN 2450-4602. pp 13-23.
13. Gordon, M. - Salvioni, C. and Hubbard, C. (2014). Semi-subsistence Farms and Alternative Food Supply Chains. EuroChoices. Vol. 13, number 1. pp. 15-18
14. ISSDA (Irish Social Science Data Archive) (2018):
<https://www.ucd.ie/issda/data/teagascnationalfarmsurvey/>. Retrieved: 04.03.2018
15. Mizik, T. (2019) Mizik, T.: (2019) A Kozos Agrarpolitika uzemszintu hatasai magyar szemszoglobol. (Impact of CAP reform on Hungarian farm structure. Gazdalkodas. 2019. No.1. pp. 3-21
16. Motion for A European Parliament Resolution on the future of small agricultural holdings:
<http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&mode=XML&reference=A7-2014-0029&language=EN#title2>. Retrieved: 14.03.2018
17. Rabinowitz, E. (2014). Farm size: Why Should we Care? EuroChoices. Vol. 13. number 1. pp. 28-29.
18. Popescu, D-L. (2014). Subsistence / Semi-subsistence Agricultural Exploitations: Their Roles and Dynamics within Rural Economy / Rural Sustainable Development in Romania. Procedia Economics and Finance 16, pp. 563-567 www.sciencedirect.com. Retrieved:18.03.2018
19. Tangermann (1994) West looks East. European Review of Agricultural Economics 21 (1994) pp. 375-392
20. Wolz, A.- Fritsch, J.- Shterev, N.- Buchenrieder, G. and Gomez y Paloma, Sergio (2010). Semi-Subsistence Farming, Farm Income and Social Capital in Bulgaria – Is there a Link? Quarterly Journal of International Agriculture 49, No. 4. pp. 285-298 DLG-Verlag Frankfurt/M.

ANALYSIS OF ECONOMIC, LEGAL AND DEMOGRAPHIC CONDITIONS FOR CARE SERVICES DEVELOPMENT IN THE UKRAINIAN RURAL AREAS

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Abstract. The study aims at identifying the initial conditions/prerequisites for the development of a care system for people who need it (the elderly, the disabled etc.). Based on the assessment of world experience, a conclusion was drawn on the effectiveness of the so-called „green care“. To ascertain the necessity in the development of such a type of activity, the structure of the permanent rural population was analysed, according to which the expediency of developing care facilities and services was justified. On the basis of the survey results with respondents of different age groups and status (heads of united territorial communities, youth aged 15-23, and older people over the age of 80 years), the difference in the choice of priorities for spending funds in different directions was set. Young people and the elderly consider the social component to be a priority, while the heads of the united territorial communities give priority to the road repair. On the basis of the analysis of the population dynamics indicators and the number of employed rural population, the reserve of people of working age was revealed, which, after completing relevant courses and obtaining the necessary qualifications, may be attracted into care activities. In the course of the research, the ways of improving the regulatory and legal framework of Ukraine, governing the provision of care services and their accounting systems, were substantiated.

Key words: care services, problems, demography, standardization, development, improvement, international experience.

JEL code: J 110, J 210.

Introduction

In world practice, there are many positive examples of a comprehensive solution to the problem of unemployment and increase in the level of social protection of the population, especially in terms of meeting the demand for care services for the elderly and the disabled. A number of scientific studies contain suggestions on innovative approaches to solving the problem of social assistance and rehabilitation.

In particular, Ryszard Kaminski, Tomasz Marcysiak and Piotr Prus (2018) substantiate the feasibility and benefits of green Care farms in Poland for the arrangement of care of elderly and disabled people. The authors point to the positive psychological and physiological influence of this kind of activity on the general well-being and the state of health of people, who were cared for. Also, scientists produce compelling statistics. These indicators characterize the initial conditions of Poland and other countries and indicate the negative form of the demographic pyramid. The latter, in turn, forms the economic and social challenges that require resolution (social protection of the disabled etc.).

A number of other problems, associated with the negative demographic dynamics and ageing of the nation, are to be addressed. As various scientists note, the following problems should be highlighted:

- the decline in the number of working-age population (Bookman and Kimbrel 2011; Borsch-Supan, 2003);
- the increase of the pension load and the need for medical care (Arai et al., 2012; Mazura, 2012);
- the need to develop a network of institutions for the care of elderly and disabled people, which requires significant financial investments (Mazura, 2012);

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- the growing need for social workers and enhancing requirements for the level of their competencies and functional responsibilities (Semygina, Gryga, 2004) etc.

In many countries, the issue of improving the quality of life of the elderly and disabled people is being addressed not only through the functioning of special state care institutions. The experience of *L'agricoltura sociale* (Italy) (Giare, 2009), *Buurtzorg* (Netherlands) (Schuringa, 2018), the new organization of home care for the sick, and others can be of great value.

In Ukraine, such areas are being explored in that context that only the territorial community and its executive authorities and self-government should determine the direction of arranging in the village an optimal living environment focused on the social interest of all residents, creating in rural settlements adequate working and living conditions (Chopenko, 2014). However, in such matters, one and the same problem remains unsolved in any country. It consists of solving financial (resource) and ethical issues. In a number of developed foreign countries, both problems are being solved by implementing various state programs and, accordingly, controlled by state institutions. In Ukraine, these problems cause concern and tough discussions at various levels of both, the authorities and the media, and still remain unsolved due to the lack of a state Strategy. It is partially embodied in the process of reforming the pension system. At the same time, the general reaction of many elderly people to this realization, as well as other segments of the population, is characterized by negative reviews. In conjunction with health care reform, budget deficits and migration trends with the large part of the young population being orientated towards education and labour abroad, the problem of social protection and ensuring appropriate living conditions for the elderly and the disabled is being exacerbated. In such circumstances, the Polish experience of organizing the so-called „green care”, as well as the experience of other countries, would be useful for Ukraine.

Thus, the aim of the study was to identify the initial conditions for the development of a care system for people who need it (the elderly, the disabled etc.). In the course of the study, an analysis of statistical indicators was used to justify the need for the development of a care system. It allowed revealing the tendency to the ageing of the Ukrainians (negative pyramid). The analysis was also used to identify the possibility of providing care activity with a workforce. Using a survey of young people (150 young people aged between 16 and 23 were surveyed), people aged over 80 years and comparing its results to a survey published in the Report on the research findings on the progress in territorial communities unification (Zvit pro rezultaty doslidzhennia uspishnosti obiednannia terytorialnykh hromad, 2017) (52 heads of united territorial communities were surveyed), an assessment of views on the priority of the task of expanding and developing a network of care institutions and such a type of activity was carried out. In the group, where 63 % of students, considere support for business development, education and science, health care and social protection (including the development of military rehabilitation centres and care centres for the elderly and disabled) to be the priority areas of spending, more than 67 % of the young people were born in rural areas. Surveys of 150 people aged over 80 years and living in rural areas showed that they had problems with care and a desired to have nurses.

The assessment of the current legal norms on social protection of the population with a view to their effectiveness has led to the conclusion that it is advisable to further standardize not only the quality of services but also their accounting and calculation systems.

Research results and discussion

Initial conditions for the development of the system of care for the elderly and disabled in Ukraine

Features and conditions of the development of care systems for the elderly, including the use of elements related to nature (occupational therapy and therapy with animals etc.), are widely represented in foreign and partially domestic publications (Kaminski, Marcysiak, Prus, 2018; Bookman, Kimbrel 2011; Schuringa, 2018; Artz, Davis, 2017; Mazura, 2012; Kanyuk, 2015; Davydyuk, 2016; et al.). The authors draw attention to the regulatory and economic factors of the development of this type of activity, as well as its results.

For Ukraine, this aspect is characterized by a low level of interest of private investors in the implementation of care activities. Therefore, it should be noted that private nursing homes, nowadays, are practically absent. But, in Ukraine, there are 286 boarding schools for adults of state and communal ownership, 238 of which are for the elderly and 48 for children and young people. Of the total number of boarding houses for adults: 62 - for the elderly and disabled; 28 - boarding houses for the war and labour veterans; 145 - neuropsychiatric boarding houses; 3 - special boarding houses. In addition, there are also territorial centres of social services that provide services at the place of residence. The staff of such centers serves about 1.5 million people, including about 400 thousand disabled people of various categories. One social worker accounts for more than 10 people in cities, and more than 6 in villages (Social protection in Ukraine, stat. digest, 2018).

Such statistics is rather disappointing against the background of the dynamic growth of the ageing rate of the Ukrainian nation, the number of persons with disabilities (according to statistical data: 2568.5 thousand people in 2015, 2614.1 thousand people in 2016, 2603.3 thousand people in 2017 and 2635.6 thousand people in 2018) and insufficient level of the Human Development Index. Concerning the latter, it should be noted that in 2017, Ukraine reached a level of 0.751, which is below the average for countries in the group with a high Human Development Index, which is 0.757, and below the average for Europe and Central Asia, is 0.771.

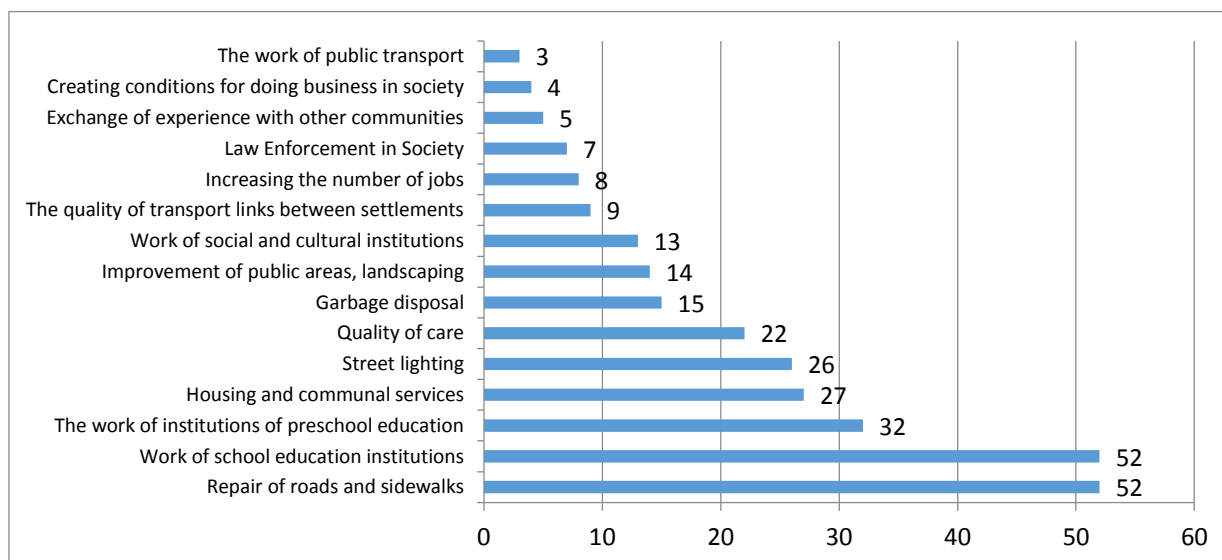
Another important indicator characterizing the standard of living is employment. During the first 9 months of 2018, according to official data released by the State Employment Service of Ukraine, the number of unemployed in Ukraine amounted to 1,549.3 thousand people, of which 33 % (503.9 thousand people) live in rural areas. The unemployment rate (according to the methodology of the International Labour Organization) in rural areas was 9.0 % of the economically active population (Ukraine: The World Factbook, 2019). As of January 1, 2019, 341.7 thousand people had the status of unemployed. In their composition, 46 % (158.5 thousand people) are rural residents. For comparison, Poland is significantly more employed in the agrarian sector - 11.5 % (2015) (Poland : The World Factbook, 2019) versus 5.8 % (2014) in Ukraine.

In addition, in Ukraine in 2018, the population aged 55 years and older was about 30.5 %, and in the structure of the rural population, this index is significantly higher. According to the national demographic forecast, by 2025 the proportion of people over 60 in Ukraine will be 25 % of the total population aged 65 and older - 18.4 %, and in 2030 - more than 26 % and more than 20 %, respectively (Strategy of state policy in relation to the healthy and active age of the population until 2022, 2018).

This indicates the presence of objective reasons justifying the need to study possible ways to increase the employment of the rural population of Ukraine. And the most important of them is overcoming unemployment and solving a number of social issues.

However, it is the situation related to the availability of vacant labour that can play a positive role in the development of care institutions in rural areas. The Ukrainian mentality, developed historically, is to foster respect for parents, and therefore most of the elderly care for children. In addition, traditionally by occupational groups in recent years, there has been the least amount of vacancies for skilled workers in agriculture and forestry, fish farming and fisheries. Therefore, internal and international migration among agricultural workers is a common phenomenon in Ukraine. It should be stated that the rural population, in spite of the significant level of unemployment, is not very willing to migrate. Therefore, the implementation of measures, aimed at the development of care facilities, could solve another issue - the issue of the rural population employment.

In general, there are many different factors that influence the development of a network of care institutions. These are norms, and the level of resource capabilities, and the state of development of the accounting system, which provides official data for statistical bodies, etc. In addition, the level of informing on the development of care institutions and focus on this sector should be considered as an important factor. The results of the survey of heads of united territorial communities (UTC), carried out within the framework of the decentralization program in Ukraine (Figure 1), indicate the following problems related to informing.



Source: Report on the research findings on the progress in territorial communities' unification. Ukraine July 2017. Available at <https://decentralization.gov.ua/pics/upload/431-1c8bc38da67e046310412ce0524d2485.pdf>

Fig. 1 Strategic directions of the community development (opinion of the leadership of the united territorial communities)

As can be seen from Figure 1, among the questions in the questionnaire, there is No question on social protection and organization of care for the elderly and disabled. Only 13 out of 52 respondents (which is about 24.5 %) consider the work of social and cultural institutions to be a priority for the development of a united territorial community.

But the results of a survey among students of economic specialties of universities in Ternopil and Kamianets-Podilskyi on their position on the areas of spending budget funds show the following result (out of 150 respondents): 63 % consider priority spending on supporting business development, education and science, health care and social protection (including the development of military rehabilitation centres and care centres for the elderly and disabled) 23 % - defence, youth housing programs, transport communication service; 10 % - development of the united territorial communities, energy-saving technologies and agriculture; 4 % - overcoming unemployment, the environment, public administration. The list of possible ways of spending budget funds, in addition

to the above mentioned, also includes culture and art, foreign economic activity, and reform of state institutions.

According to a survey of 150 people aged over 80 years living in rural areas, the following results were obtained (Table 1).

Table 1

Results of a survey of elderly people aged 80 years * (150 people surveyed)

Questions	Answer	Amount	% of the total number of respondents
Do you live yourself?	yes	102	68.0
Do you have a carer from a social welfare body?	yes	18	12.0
Are you satisfied with the level of care for you?	yes	39	26.0
Do you need constant care?	yes	32	21.3
Do children take care of you more than once a week?	yes	27	18.0
Do you consider it necessary to form care institutions in your area if you are not able to receive home care?	yes	128	85.3
Do you think that caregivers can provide more qualified services than family and friends?	yes	137	91.3
Are care services sufficiently developed in your area?	yes	12	8.0

* Ternopil and Kamianets-Podilskyi region, Ukraine

We suppose that such survey results indirectly indicate the need for the development of care institutions for the elderly and disabled people. Thence one can make an objective conclusion on the expediency of expanding the Ukrainian market of services through the creation of private boarding houses for the elderly and disabled, where the medical and social care of high-level would be provided.

Taking into account the favourable conditions for the implementation of such activities in rural areas, we tend to think about the good prospects for the establishment of geriatric institutions based on the principles of private property. Regarding the legislative regulation point of view, issues of social protection of the elderly in Ukraine are regulated by standards of different levels (Table 2).

Table 2

Basic legal and regulatory acts and their provisions on the organization of services and care for the elderly and disabled in Ukraine

Legal act	Content of recommendations
The Law of Ukraine „On the Basic Principles of Social Protection of Labour Veterans and Other Elderly Citizens in Ukraine”*	Article 32 guarantees senior citizens free medical care in geriatric centres, hospitals for elderly citizens and other inpatients, outpatient clinics, as well as at home, taking into account the achievements of gerontology and geriatrics in the manner prescribed by the legislation of Ukraine on health care. Article 36 states that „social assistance to senior citizens who have partially or completely lost the ability to self-care, at their request, can be care provided directly at home or in an appropriate institution (orphanage, territorial social service centre, home for veterans, boarding house for aged citizens or in another institution) temporarily or permanently „.
Order of the Ministry of Social Policy „On approval of model regulations on residential homes (boarding houses) for the elderly and disabled”**	Regulates the activities of boarding houses

* Source : Legislation of Ukraine. Order of the Ministry of Social Policy „On approval of model regulations on residential homes (boarding houses) for the elderly and disabled”. Retrieved from <https://zakon.rada.gov.ua/laws/show/3721-12>

* Source : Legislation of Ukraine. Order of the Ministry of Social Policy „On approval of model regulations on residential homes (boarding houses) for the elderly and disabled” Retrieved from <https://zakon.rada.gov.ua/laws/show/z0066-02?lang=en>

The legal and regulatory documents listed in Table 2 contain key and fundamental regulations, compliance with which guarantees care at the proper level. This regulation is strengthened by the accession of Ukraine to international agreements on the organization of care for the elderly and disabled.

Despite this, one of the major problems in improving the quality of care and development of these institutions is the lack of leverage over the activities of private care institutions. They began to develop over the past 15 years. However, their records are still not kept. Accordingly, there are no effective influence and control leverage over their activities. Residence in such establishments is paid by relatives or persons in need of care. Most private establishments have comfortable living conditions and high-quality care. However, there are also examples of accidents, including fires, in which were injured. Therefore, there is a need to develop controlling institutions, as well as to improve the accounting system of business entities of private ownership and the activities they carry out.

The initial condition for the development of care institutions in rural areas, as already noted, is the availability of the able-bodied population. However, the dynamics of this indicator for 2014-2017 has a negative tendency to decrease in the number of persons of working age (from 16 to 59 years old.) (Table 3).

Table 3

Resident population* (as for 1 January; thousands persons)

	2014	2015	2016	2017	2018
Total	45245.9	42759.7	42590.9	42414.9	42216.8
including:					
male	20918.3	19787.8	19717.9	19644.6	19558.2
female	24327.6	22971.9	22873.0	22770.3	22658.6
Rural population	14164.9	13325.3	13244.7	13171.4	13084.6
including:					
male	6673.9	6284.7	6254.2	6225.9	6194.4
female	7491.0	7040.6	6990.5	6945.5	6890.2
Share of rural population, %	31.3	31.2	31.1	31.1	31.0
including:					
male	31.9	31.8	31.7	31.7	31.7
female	30.8	30.6	30.6	30.5	30.4
Population at the age 16-59	28372.5	26613.3	26317.4	25982.0	25641.3
including:					
male	13796.8	12962.7	12834.3	12689.6	12541.2
female	14575.7	13650.6	13483.1	13292.4	13100.1
Rural population at the age 16-59	8442.1	7911.9	7855.4	7792.1	7707.6
including:					
male	4271.7	4007.0	3977.8	3945.2	3905.4
female	4170.4	3904.9	3877.6	3846.9	3802.2
Share of rural population at the age 16-59, %	29.8	29.7	29.8	30.0	30.0
including:					
male	31.0	30.9	31.0	31.1	31.1
female	28.6	28.6	28.8	28.9	29.0

* Excluding the temporarily occupied territories of the Autonomous Republic of Crimea, and the city of Sevastopol.

Source: *Agriculture of Ukraine - 2017. Statistical Yearbook (2018). Kyiv: State Statistics Service of Ukraine, p. 19*

From table 3 it can be seen that the rural population at the age 16-59 in 2014 numbered 8442.1 thousand people, and in 2017 by 734.5 thousand people less (7707.6 thousand people). According to the implementation structure through 2014-2017, male population prevails and this is a steady trend (the index ranges from 30.9 to 31.1 %).

The employed population in 2017 numbered 16156.4 thousand people (Table 4), which constitutes 38.27 % of the total population of Ukraine. The number of employed persons in the rural population in 2017 amounted to 2,860.7 thousand people, which is more than 37.1 % of the rural population aged 16-59, or 21.86 % of the total rural population.

Table 4

Employment by type of economic activity * (thousands persons / percentage to total)

	2014		2015		2016		2017	
Total	18073.3	100	16443.2	100	16276.9	100	16156.4	100
Agriculture, forestry and fishing	3091.4	17.1	2870.6	17.5	2866.5	17.6	2860.7	17.7
Industry	2898.2	16.1	2573.9	15.7	2494.8	15.3	2440.6	15.1
Constructions	746.4	4.1	642.1	3.9	644.5	4.0	644.3	4.0
Wholesale and retail trade; repair of motor vehicles, motorcycles	3965.7	21.9	3510.7	21.3	3516.2	21.6	3525.8	21.8
Transportation and storage, postal and courier activities	1113.4	6.2	998.0	6.1	997.2	6.1	991.6	6.1
Accommodation and food service activities	309.1	1.7	277.3	1.7	276.7	1.7	276.3	1.7
Other types of economic activity	5949.1	32.9	5570.6	33.8	5481.0	33.7	5417.1	33.6

* Data for 2014 exclude the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, from 2015 – also exclude a part of temporarily occupied territories in the Donetsk and Luhansk regions.

Source: *Agriculture of Ukraine - 2017. Statistical Yearbook (2018). Kyiv: State Statistics Service of Ukraine, p. 20*

In the number of the permanent rural population, the number of persons under the age of 15 is 2329.4 thousand. Thus, there is a reason to assert that, from the point of view of providing labour resources, now and in the long run rural areas have significant reserves. This should be assessed as a positive factor in the organization of activities for the care of the elderly and disabled people. However, the delay in improving the legislative framework and the creation of favourable conditions for the development of both state institutions and private care institutions may lead to the loss of a significant amount of labour resources through the international migration of the Ukrainian population. Therefore, the existing advantages of the working population availability should be immediately taken.

Another important condition for the development of care institutions is the material and technical base. The presence of free premises in the rural area (state ownership and premises belonging to territorial communities) can be positively assessed. These are the premises of former kindergartens, hospitals that are in good condition. They were freed due to the reform and consolidation of health care facilities and due to the reduced need for the number of places in kindergartens due to the decline in the birth rate in Ukraine. In particular, according to statistical data, the number of hospitals in Ukraine in 2015 calculated 1,775 units, in 2016 - 1,743 units, and in 2017 – 1,714 units (Health Care institutions and the incidence of the population of Ukraine in 2017. Statistical digest, 2018). That is, in 3 years the number of hospitals decreased by 61 units. Such premises are the most adapted to the residence of persons in need of care. Subject to their refurbishment and major repairs, these facilities can serve a good material basis for care activities. Construction of new buildings will cost much more. Though, it is not a significant obstacle to the development of such a needed and demanded activity.

An alternative approach to care also includes a home wardship. In Ukraine, it develops within the framework of the All-Ukrainian social program „Home care”. Such care is exercised over single people who cannot take care of themselves on their own. Actually, the provision of high-quality medical and

social assistance to those in need is guaranteed thanks to the approval of the program. This line of assistance was established in Ukraine in 1998. However, in case of both, the care institutions and in the organization of home care, there is one and the same problem - the provision of qualified personnel. Nowadays, there are practically no institutions, training specialists for nursing the elderly and disabled people in Ukraine. This problem should also be solved soon.

Conclusions, proposals, recommendations

The conducted study allows concluding that there is an objective need and favourable conditions for the development of care activity for the elderly and the disabled in rural areas of Ukraine. There is also a number of issues and obstacles to be solved in order to enhance care services. A number of measures should be taken to ensure the dynamic development of the institutions' network and care activities.

To improve the quality of care, it is advisable to develop and approve national standards for care, which should be based on international requirements, including Minimum standards for the inclusion of the elderly and disabled in humanitarian response programs (Age and Disability Consortium, 2015).

Private institutions establishment will positively affect the scope of care services. However, a prerequisite for such activities should be a license. The public institution, namely the above mentioned State Service for the Care Services Quality, should be entrusted with the issuance of such a license. In addition, it is necessary to establish a system for monitoring and assessing the quality of the services provided by state and public regulatory bodies. One of the most effective levers over care activity should become the development of the system of informing on the inspections results.

To improve the accounting of business entities, providing care services of private ownership, and the activities they carry out, it is necessary:

- to create a Unified Register of social service providers and to introduce mandatory registration of care providers in it;
- to develop a system of standards for cost per capita, which is being watched, as well as an approach to the formation of individual cost calculations. This is due to the individual and specific needs of each person (state of health, the need for medicine and care products, the individual characteristics of the body, etc.).

In order to attract the rural working-age population to the provision of care services, retraining courses with the issuance of a relevant certificate, and training programs for care specialist in medical education institutions should be established. The development of volunteering (conducting training sessions with older people in different specialties, for example, mastering computers) is quite perspective.

Bibliography

1. Agriculture of Ukraine - 2017. Statistical Yearbook (2018). Kyiv: State Statistics Service of Ukraine, 245 p.
2. Arai, H., Ouchi, Y., Yokode, M., Ito, H., Uematsu, H., Eto, F., ... Members of the Subcommittee for Aging. (2012). Toward the realization of a better aged society: Messages from gerontology and geriatrics. *Geriatrics & Gerontology International*, 12, 16–22. doi:10.1111/j.1447-0594.2011.00776.x.
3. Artz, B., Davis, D.B. (2017). Green Care: A Review of the Benefits and Potential of Animal-Assisted Care Farming Globally and in Rural America. *Animals*, 7(4), 31. doi:10.3390/ani7040031
4. Berezin, O.V., Bezpartochniy, M.G. & Nikileva, L.O. (2013). Mekhanizmy formuvannya ta metodolohiya rozvytku zakladiv i pidpryyemstv sotsial'noho obsluhovuvannya (The mechanisms of formation and methodology development institutions and enterprises of social services). Poltava: InterGrafic
5. Bookman, A., & Kimbrel, D. (2011). Families and Elder Care in the Twenty-First Century. *Future of Children*, 21(2), 117-140.

6. Chaikovskaya, V. Home care in Ukraine: how and to whom is social assistance provided for singles? Press Center „Glavkom”. Retrieved from https://glavcom.ua/specprojects/press_center/domashnya-opika-v-ukrajini-yak-i-komu-nadajetsya-socialna-dopomoga-dlya-samotnih-441467.html
7. Chopenko, V.M. (2014) Shliakhy podolannia sotsialno-demografichnoi kryzy na seli (Ways of overcoming the socio-demographic crisis in the countryside). *Ekonomika APK*, 11, 56-60.
8. Davydiuk, O.O. (2016). Deinstytutsionalizatsiia sotsialnoho obsluhovuvannia osib pokhlyoho viku v Ukraini. *Demohrafiia ta sotsialna ekonomika*, Vol. 2, Issue 27, pp. 143-155.
9. Kaminski, R., Marcysiak, T., & Prus, P. (May 9-11, 2018). The Development of green Care in Poland. In: Proceedings of the 2018 International Conference «ECONOMIC SCIENCE FOR RURAL DEVELOPMENT», No 49, Jelgava, LLU ESAF, pp. 307-315. DOI 10.22616/ESRD.2018.148 1.
10. Kaniuk, O. (2015). Profesiini vymohy do maibutnikh sotsialnykh pratsivnykiv (Professional requirements for future social workers). *Aktualni pytannia humanitarnykh nauk*, No 11, pp. 252-259.
11. Mazura, I. (2012). Problema starinnia natsii dobralasia i do Ukrainy? *Informahentsvo Forum* (The problem of aging of the nation got to Ukraine? Information Agency Forum). Retrieved: <https://for-ua.com/analytics/2012/04/18/083044.html>
12. Minimalni standarty vkluchennia osib pokhlyoho viku ta liudei z invalidnistiu (Minimum standards include older people and people with disabilities). (ADCAP). Age and Disability Consortium. 2015. Retrieved: https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/minimum_standards_ukrainian.pdf
13. Poland : The World Factbook (2019). Washington, D.C. : Central Intelligence Agency. Retrieved: <https://www.cia.gov/library/publications/the-world-factbook/geos/pl.html>.
14. Semygina, T., & Gryga, I. (Eds.) (2004). *Sotsial'na robota z konkretnymy grupamy kliientiv (Social work with specific groups of clients)*. Kyiv: Kyievo-Mogyljanska Akademija.
15. Social protection in Ukraine, stat. digest. (2018). State Statistics Office of Ukraine. Retrieved: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_szn_2017.pdf.
16. Schuringa, L. (April 2018). The transition from Green to Yellow How to really make it happen. Utrecht, 16 p.
17. Semyhina, T.V. (2007). Orhanizatsiya nadannya sotsial'nykh posluh na rivni hromady yak zahal'na tendentsiya rozvytku sotsial'noyi roboty (The organization of social services at the community level as a general trend of social work). *Sotsial'na polityka, sotsial'na robota y okhorona zdorov'ya: yak Ukrayini dosyahty yevropeys'koho rivnya yakosti posluh? (Proceeding conference «Social policy, social work and health, as Ukraine reach the European level of service quality?»)*, pp. 35-38. Kyiv: Sphera.
18. Stratehiia derzhavnoi polityky z pytan zdorovoho ta aktyvnoho dovolittia naselennia na period do 2022 roku: Rozporiadzhennia Kabinetu Ministriv Ukrainy vid 11.01.2018 r. № 10-r. (Strategy of state policy in relation to the healthy and active age of the population until 2022) (2018). Retrieved: <http://gl.kr-admin.gov.ua/index.php/blog/item/1138-stratehiia-derzhavnoi-polityky-z-pytan-zdorovoho-ta-aktyvnoho-dovolittia-naselennia-na-period-do-2022-roku>
19. Zaklady okhorony zdorovia ta zakhvoriuvanist naselennia Ukrainy u 2017 r. *Statystychnyi zbirnyk (Health Care institutions and the incidence of the population of Ukraine in 2017. Statistical digest)*. Kyiv: Derzhavna sluzhba statystyky Ukrainy, 2018. 109 p.
20. Zvit pro rezultaty doslidzhennia uspihnosti obiednannia terytorialnykh hromad. Ukraina. Lypen 2017 r. (*Report on the research findings on the progress in territorial communities unification. Ukraine*. (July 2017). Retrieved: <https://decentralization.gov.ua/pics/upload/431-1c8bc38da67e046310412ce0524d2485.pdf>
21. Ukraine: The World Factbook (2019). Washington, D.C.: Central Intelligence Agency. Retrieved <https://www.cia.gov/library/publications/the-world-factbook/geos/up.html>.
22. Vitchyzniani ta zarubizhnyi dosvid orhanizatsii dozvillia liudei pokhlyoho viku (Domestic and foreign experience in organizing the leisure of the elderly) (January 31, 2018). Osvita.ua. Retrieved: <http://osvita.ua/vnz/reports/culture/11085/>.

ORGANIZATION OF FOOD SUPPLY CHAINS IN DISPERSED PRODUCTION ON THE EXAMPLE OF THE OIL SECTOR IN POLAND

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Abstract. The study presents a diagram of the supply chain in agribusiness prepared by the authors. A graphical presentation of the flow of raw materials and fat products from primary producers (producers of raw materials and means of production for agriculture) to the consumer was developed. Trends of changes in the production of rape and its products, which occur after the economic transformation, are presented. It was found that the logistics chain for the supply of rape and its products includes thousands of farmers, agri-food processing units, agricultural trade, wholesale and retail food trade. It must be flexible, adapting to new challenges. The condition for success in the conditions of dispersed production of raw materials is the efficiency of chain management as well as solidarity and mutual trust of the participants.

Key words: logistics, agriculture, oil industry, oilseed rape, vegetable oils.

JEL code: Q11, Q13, R40, R41.

Introduction

Oilseed plants are becoming one of the most important agricultural products in Poland and in the world. Globally, there are several important plants of this group, such as: soybean, cotton, peanuts, rapeseed, sunflower, palm kernels, copra, flax, sesame and castor oil (Wittkop B., Snowdon R.J., Friedt W.) Their global collections in 2017 were estimated at 562.7 million tonnes. In Poland, the basic oily plant was rapeseed, belonging to the category of industrial crops, whose value in 2016 was 6.9 billion zlotys, that is 6.69 % of Polish global agricultural production and 6.73 % of commodity production (Central Statistical Office, 2017). In 2017, 2.7 million tonnes of rapeseed were collected in Poland, while 3.2 million tonnes were available at the disposal of resources and imports (IAFE-NRI, 2018). Poland was the third producer of rape on a European scale, more is produced only by France (5.2 million tonnes in 2017) and in Germany (4.3 million ha) (IAFE-NRI, 2018).

Rapeseed is important as a source of income producers (on good soils and medium-sized), and in creating jobs. It is the basic raw material in the oil industry (traditionally) and - more and more widely in the production of renewable fuels. Waste from processing is used as a component in the production of feed (grits) for livestock.

The importance of production and the increasingly promising prospects for using rapeseed for non-consumer purposes, but also energy (Sambra A., Sørensen C.G., Kristensen E.F., 2009), as well as a relatively favorable level of profitability of this activity compared to other plants triggers farmers' interest in rape cultivation (Elbehri A., Hoffman L., Ash M., Dohlmán E., 2001). The significant number of producers and processors results in the growing interest of farmers, oil companies and salesmen in the efficiency of purchase and flow of grain and its products, that is the functioning of logistics chains (Rokicki T., 2013). The aim of the study was to identify the supply chains used in agribusiness, especially in the trade of oilseed rape and its products, as well as the trends of changes taking place in this sector. The studies used available mass statistics data - Central Statistical Office, data prepared by Institute of Agricultural and Food Economics - National Research Institute (IAFE-NRI) and literature on the subject.

From the produced vegetable oils (about 190 million t in the 2017/2018 season), the most important item was palm oil (about 70 million t), then soybean oil (55.6 million t), rapeseed (25.8) and sunflower oil

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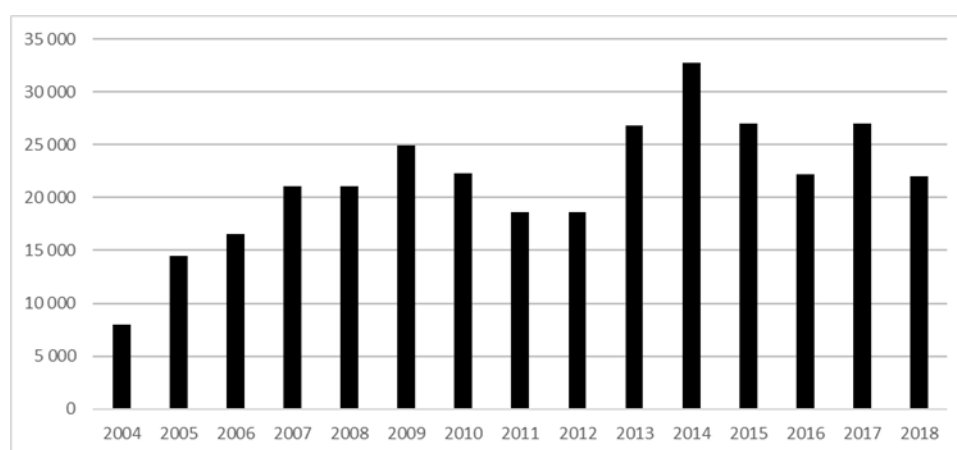
(18.9). The most important eight oils are palm kernel oil (7.5), cotton (4.5), arachis (4.0) and coconut oil (2.8 million tons).

Trends in global and domestic production of oilseeds

The most important oil plants in the world are just three species. The global seed production in 2017/2018 amounting to 562.6 million tonnes as high as 338.3 million tonnes (60.2 %) was soybeans, 66.4 million tonnes (11.8 %) oilseed rape and 49.7 million tonnes (8.8 %) sunflower (IAFE-NRI, 2018). Their collections show a certain variability. For example, soybean production in 2017/18 decreased by 2.7 % compared to the previous season, and in the next (according to forecasts), it will grow by 5 %. The same was true for sunflower seeds (corresponding figures were -0.6 % and 3.3 %), while in the case of rapeseed, it was the reverse (5.0 % and -3.3 %). Soybean production has been invariably dominated by US and Brazil agriculture (about 120 million tonnes) for years, followed by Argentina (with an upward trend, up to a projected figure of around 50 million tonnes in 2018/2019) and China (over 15 million tonnes). Canada and the European Union (about 20 million tons) are a powerhouse in the production of rapeseed. The major producers include India, China, Ukraine, Russia and Australia. The production of sunflower is distinguished by countries such as Ukraine, Russia, China and Turkey.

In the European Union, the size of oilseed crops is determined by the rapeseed harvest, the remaining plants are marginal or non-existent. In turn, in the production of rape, besides France, Germany and Poland, the major producer was Great Britain (2.1 million tonnes) Romania (1.8) and the Czech Republic (1.1 million tonnes) (IAFE-NRI, 2018).

In Poland, the area of rape cultivation prior to integration with the European Union was about 0.4 million ha, but after accession it quickly increased, even more than twice, to around 0.9 million ha. The yields also increased (from 2.1 to 2.8 t/ha), which together resulted in an increase in the harvest of rapeseed from 0.9 to 2.5 million tons (IAFE-NRI, 2018). From this in Poland, about 1.4 million tons are needed for food purposes. This means that on average, it is possible to allocate (variable) seeds for processing for energy purposes every year (Figure 1).



Source: author's calculations based on the Central Statistical Office data 2004-2018

Fig. 1. Rapeseed production in Poland in 2004 - 2018 (thousand tonnes)

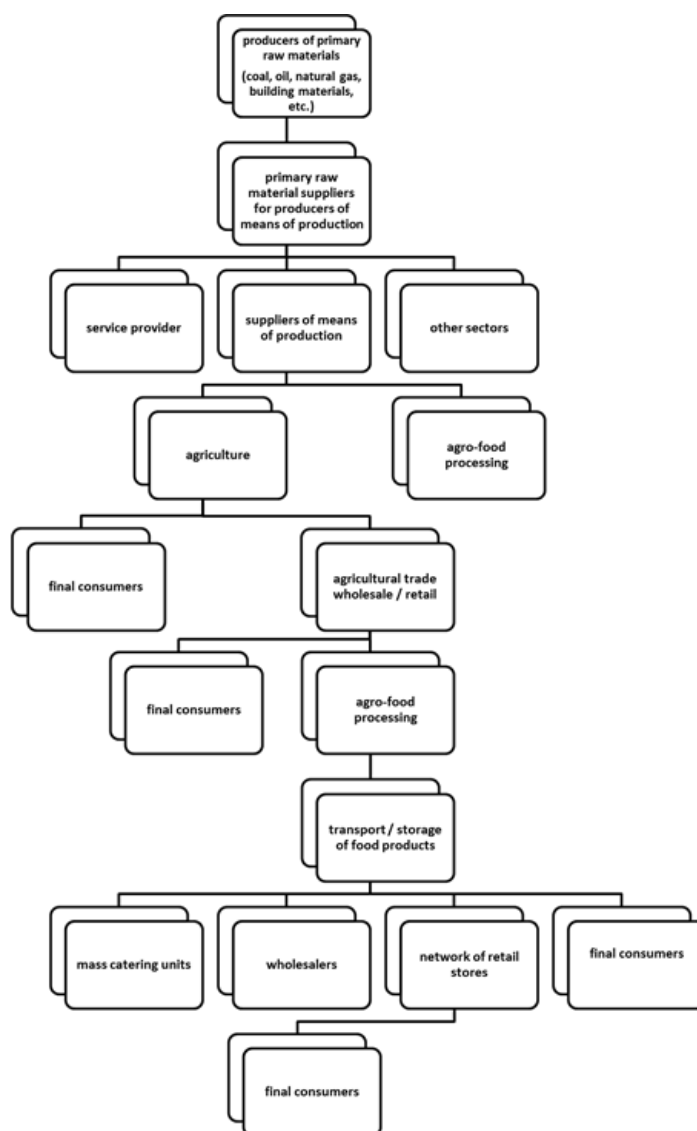
The cultivation of rapeseed in Poland is spatially diversified, as farms from Western and Northern Poland dominate here. It can be briefly stated that rapeseed is grown more widely in areas where there used to be a lot of state-owned farms, and now larger farms dominate. In seven western provinces (for 16 in Poland), the proportion of rapeseed in sowings accounted for more than 10 %, and in three of them even more than 16 %.

Typical supply chain in agribusiness

The logistics supply chain means the subsequent stages of the entire process of the flow of goods and services from the producer to the consumer. Such a chain can be of various length and depth, and thus start with primary raw material producers for the entire production (e.g. oil, coal etc.) or from a specific chain link. Regardless of their length, all operations and processes must be coordinated in organization and financially.

In a typical logistics chain, there are many processes related to production management, inventory, demand, order fulfilment and purchases. Therefore, we deal with such links as: obtaining raw materials (e.g. extraction), supply of raw materials and semi-finished products, production as well as distribution of finished products to the customer. The logistics chain is a network extending between the supply and sales markets, producers, suppliers, commercial and logistic units, and final recipients (Klepacki B., Jarzebowski S., 2000). It covers the flow of goods, information and financial resources.

The basic principles and organizational forms existing in logistic chains are also valid in food flows. The organizational chart common to almost all agribusiness chains is shown in Figure 2.



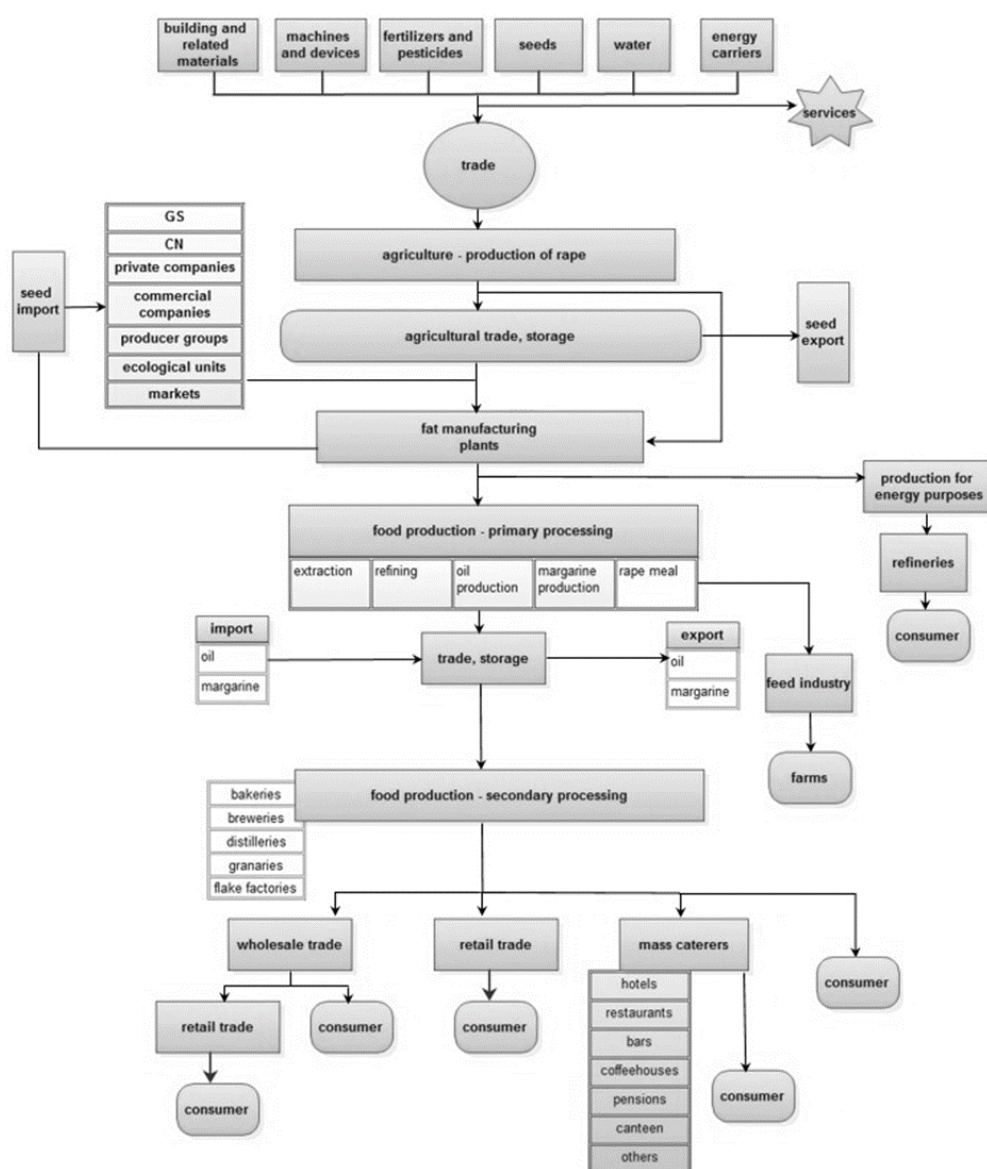
Source: developed by authors

Fig. 2. Generalized scheme of food supply chains

Rapeseed and oil products flow

Within the framework of agribusiness there are many logistic chains concerning individual agricultural raw materials. As the most important one can indicate chains: grain, oilseeds and their products, milk, beef, pork, fruit and vegetables. Primary products in agriculture (raw materials) are: cereal grains, seeds of oil and legume plants, grass grasses, roots and tubers of root crops, fruits and vegetables. Agricultural grains are decisive for the scale of agricultural production, however, all products, including oilseeds, are important. In contrast to cereals, for which agriculture is both a producer and a consumer, in the case of rapeseed it is primarily a producer, to a small extent a consumer (only seeds for sowing).

Food products can be obtained from rape as a direct or indirect material. The first group includes milling products, or ground meal as animal feed. Their share in consumption is minimal. Rape as an intermediate supplier plays a more important role, being a source of raw material (fat) for the production of oils and margarines. The importance of this product means that its movement and processing must take place in the operational links of many networks of connections (Klepacki B., 2000). The main processes of the rape supply chain and their links are shown in Figure 3.



Source: developed by authors

Fig. 3. Supply chain pattern oilseed market

The rapeseed supply chain begins with producers and suppliers of means of production³, such as agricultural machinery and tools, construction materials, energy carriers, fertilizers, plant protection chemicals, animal feed, medicines, seed and seed, etc. It is possible to look for the „roots“ of the chain already in mines, machinery factories, chemical plants, but also in other farms. This indirectly indicates how great the recipient / buyer of industrial and own production is the agricultural sector.

Agricultural production takes place in a large number of relatively small farms, hence it is very dispersed and requires a good system of connections between grain producers and recipients, good organization of transport and storage (Leao R.R.D.C.C., Hamacher S., Oliveira F., 2011). In contrast to other activities in agriculture, the number of rapeseed producers has not decreased, but increased from 43 to 90 thousand, more than double. This proves the growing interest of farmers in the production of rape. It is worth noting that the number of total farms has decreased from 2.0 to 1.4 million, or 30 % (IAFE-NRI, 2018).

Rapeseed flow for processing takes place through many channels. The simplest is the relationship: producer - processor, the farm - Oil industry plants etc. (Hobbs, J.E., Young L.M., 2000). This type of supply already exists, however, concerns mainly manufacturers of large batches of rape or producer groups. Many farmers produce smaller quantities of rapeseed and use the services of intermediaries, such as commercial companies and private entities.

Trends in the organization of supply chains oilseeds and their products

Socio-political changes and accession to the European Union influenced the Polish oil sector in both production and structural aspects. The most important trends can be regarded as follows:

- the decreasing number of farms in Poland was accompanied by the growing number of rapeseed producers and the increasing scale of its production (Carre P., Pouzet A., 2014);
- the role and strength of direct connections between the processing industry and seed producers has increased, which is expressed among others by imposing production technologies on farmers, the number of intermediary links in the oil chain is decreasing;
- precision in the application of technological requirements increases, especially in the use of chemicals;
- outsourcing services for farmers are being developed, especially in the field of seed marketing, but also wholesale supply of revolving production means;
- consolidation processes are progressing and the number of grain and rapeseed units is decreasing, while local marketplace trade has been marginalized;
- the size of processing plants grows and their consolidation;
- there has been significant technological progress and increased requirements in the field of technological and hygienic regime in food processing (Sporleder T.L., Goldsmith P.D., 2003) including oilseed processing;
- there was a decrease in the role of small processing units, practically eliminating small oil mills;
- there has been significant progress in the field of transport and storage infrastructure on the national scale, which means that logistics costs in individual terms are decreasing.

Conclusions, proposals, recommendations

- 1) The oilseed sector is one of the most important in Polish agribusiness, and its functioning is an important factor determining the economic situation of many economic entities in agriculture and beyond.

³ In the presentation of logistics chains of agricultural raw materials and their preserves, the authors usually omit the link of producers and suppliers of raw materials and production means for agriculture. However, the authors consider this to be an erroneous approach, because modern agriculture depends on the quantity, quality and timeliness of their deliveries to the same extent as industrial or commercial enterprises.

- 2) The logistics chain for the supply of rape seeds and its products is very extensive, it includes thousands of rapeseed producers, agri-food processing units, agricultural trade, wholesale and retail food trade. It must be flexible, adapt to new challenges related to the technological and organizational progress and changes taking place in the agribusiness environment and among clients.
- 3) Agriculture for many centuries functioned in some functional isolation from the rest of the economy. Today, it is a full-fledged member of the food and national food economy complex. Individual links of the chain are connected by a community of economic interests, both short-term (season, year) and strategic.
- 4) The condition of success in supply chains, in the conditions of dispersed production of raw materials, is the efficiency of their management and equally solidarity and mutual trust of producers, traders, processors, consumers, recognition that each participant in the chain gains in a similar range.

Bibliography

1. Carre, P., Pouzet, A., (2014). *Rapeseed Market, Worldwide and in Europe*. Oilseed Fats Crops Lipids 21, D102. Retrieved: <https://www.ocl-journal.org/articles/ocl/abs/2014/01/ocl130035/ocl130035.html>. Access: 10.01.2019
2. Elbehri, A., Hoffman, L., Ash, M. Dohlman, E. (2001). *Global Impacts of Zero-for-Zero Trade Policy in the World Oilseed Market: A Quantitative Assessment*. Paper presented at the 4th conference on global economic analysis, Purdue University, West Lafayette, Indiana, USA, 26–29 June 2001.
3. Hobbs, J. E., Young, L.M. (2000). *Closer Vertical Coordination in Agri-food Supply Chains: A Conceptual Framework and Some Preliminary Evidence*. Supply Chain Management: An International Journal 5. No. 3, pp. 131-142.
4. Klepacki, B. (2000). *Oil-seeds Market. The Strategic Options for Polish Agro-food Sector in Light of Economic Analyses*. Warsaw Agricultural University. Research and Implementation Centre. Warsaw. pp. 305–321.
5. Klepacki, B., Jarzebowski, S. (2013) *Lancuchy dostaw w gospodarce zywnosciowej*. Zeszyty Naukowe SGGW Seria Ekonomika i Organizacja Gospodarki Zywnosciowej. No.103. pp. 107-117.
6. Leao, R.R.D.C.C., Hamacher, S., Oliveira, F. (2011). *Optimization of Biodiesel Supply Chains Based on Small Farmers: A Case Study in Brazil*. Bioresource technology. No. 102, pp.8958-8963.
7. *Maly Rocznik Statystyczny GUS*. (2018). Retrieved: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/1/19/1/maly_rocznik_statystyczny_polski_2018.pdf. Access: 10.01.2019.
8. *Powszechny Spis Rolny 2010. Gospodarstwa rolne w Polsce na tle gospodarstw Unii Europejskiej* (2013) GUS. Warszawa. pp. 23,90.
9. *Rocznik Statystyczny Rolnictwa 2017*. (2018). Retrieved: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/6/11/1/rocznik_statystyczny_rolnictwa_2017.pdf Access: 10.12.2015.
10. *Rynek rzepaku, stan i perspektywy. Analizy rynkowe*. (2018). IERiGZ-PIB. Warszawa. pp.7-24.
11. Samba, A., Sorensen, C.G., Kristensen, E.F. (2009). *Supply Chain Optimization of Rapeseed as Biomass Applied on the Danish Conditions*. The 7th EFITA Conference, Wageningen, The Netherlands.
12. Sporleder, T.L., Goldsmith, P.D. (2003). *Differentiation Within the Grain and Oilseeds Sectors: The Evolution and Reengineering of Supply Chains*. Proceedings of the Symposium: Product Differentiation and Market Segmentation in the Grains and Oilseeds: Implications for Industry in Transition. USDA and Farm Foundation. Washington, D.C.
13. Wittkop, B., Snowdon, R.J., Friedt, W. (2009). Status and Perspectives of Breeding for Enhanced Yield and Quality of Oilseed Crops for Europe. *Euphytica* 170, pp. 131-140.

MENTAL COMFORT OF POLISH AGRICULTURAL PRODUCERS (PARTICIPATING IN FADN) AS A PART OF SUSTAINABILITY INDICATOR

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Abstract. The research on social dimension of sustainability is rather underdeveloped when it comes to farms. This paper contains presentation and assessment of parameters describing mental comfort of Polish farmers participating in FADN. Basing on the representative sample of 600 farmers, we concluded that the distribution of mental comfort index was close to normal. The index of mental comfort and the index of living conditions were not correlated, but we could observe low, positive correlations between the index of mental comfort and the economic size of the farm. According to the survey, the farmers are rather overworked. They feel less stress when they can manage the risk and more when they have No influence on the situation. About 1/3 feel frustrated because they do not understand some of the law regulations concerning their type of activeness. The level of mental comfort was positively correlated with the level of education of the respondents.

Key words: sustainability indicators, social sustainability, farms, FADN sample, Poland.

JEL code: Q01, Q12, I31.

Introduction

Sustainable development and sustainability at various levels have been a problem addressed by scientists of many specialisations as well as policymakers for decades. The interest in this topic burst out in the late 1980s after the Brundtland report was published (World Commission..., 1987), but its history is much longer (Spindler, 2013), (Vehkamaki, 2005). In the common sense, sustainability is usually associated with access to or preserving natural resources (clean air and water, energy resources, fertile soil etc.). Concentrating on the natural resources, preservation implicates that quite often sustainability is understood as being environmentally friendly, putting less stress on the social issues (Bebbington and Dillard, 2009, cited after Galdeano-Gomez, Perez-Mesa and Godoy-Duran, 2016). We should remember, however, that the aims of development are always social, and they should be reached with the consideration of environmental impact and economic feasibility (Sachs, 2011). Although we believe that real sustainability can be achieved only when all of the dimensions (namely: environmental, economic, and social) are considered - according to the „strong sustainability” concept (Pearce, 1993), (Thompson, 2007) - in this paper we would like to focus only on the social issues.

The indicators of social sustainability are quite often used in the research at national level (for example Raczkowska (2017) or Mikula (2016) writing about social inclusion) or at regional and local level (Wykluczenie, 2006; (Mikula, 2017), but they are rather underdeveloped at the level of particular economic units. Farming is a specific type of economic activity, where there is No clear division between a business unit and a family (Lowrance, Hendrix, and Odum, 1986). Thus, „the motivations of family farmers often go far beyond profit maximization, and encompass social and ecological aspects that will benefit their community” (Galdeano-Gomez, Perez-Mesa and Godoy-Duran, 2016, p. 352). At the same time, the production process is very much dependent on the climatic conditions and soil quality; this is why it is quite natural that the researchers dealing with sustainability in farming concentrate mostly on the environmental issues (Balbi et al., 2015;Reyter, Hanson and Henninger, 2014). There are some analyses that focus on the social dimension of sustainability in farming (Campbell et al., 2004; Bacon et al., 2011; Galdeano-Gomez, Perez-Mesa and Godoy-Duran, 2016), but according to Latruffe et al. (2016), social sustainability of farms (and, more broadly, of agriculture) is the dimension that would need the most development of

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indicators in the future. It is still much easier to find theoretical frameworks or assessment tools than publications containing research results on this topic (Hennessy et al., 2013).

We should be aware of the fact that „farmers make land-use decisions not only in a business context but also in a personal context (...). It relates to individual and social conditions in which the farmer operates, including personal capabilities such as knowledge, skills and power, and attitudinal and psychological dimension.” (Greiner R., 2015, p.155). Consequently, their influence on both economic development and natural environment is affected also by their understanding of the surrounding conditions (law regulations, economic mechanisms etc.), and by the level of stress they have to face. This is why, while describing social dimension of sustainability, we have used (among many others) indicators of the farmers’ mental comfort. The aim of this paper was to describe and assess different aspects of mental comfort of agricultural producers participating in Polish FADN, as well as the relationships between the mental comfort indicator and chosen farm and farmers’ characteristics.

Methods

The research³ was based on the database of Polish FADN⁴ (Farm Accountancy Data Network), with additional data obtained through face-to-face structured interviews with farmers. Our sample consists of 600 farms participating in the Polish FADN system. They were selected using a layer/random selection procedure (Neyman, 1934; FADN, 2008; Was A., 2013) considering their representativeness in specialisation of production, standard output, and region. Given that the applied layer-random sampling method reflects the structure of farms in the population surveyed by FADN, we can assume that it is representative for the population of farms being in scope of observation of the Polish FADN. The interviews with farmers were conducted in 2017 by advisers from regional extension centres, who coordinated the collection of data within the FADN system. The data from interviews was added to relevant data available in the FADN database.

Research results

During the analyses we have assumed that sustainability has three dimensions: economic (on a farm understood as economic potential and production potential), environmental (environmental perception and correctness of agricultural practice), and social (living conditions and mental comfort).

In this paper, only the mental comfort indicator will be described in more details. We assumed that mental comfort of the farmers depends on the following issues: social status; health; free time and workload; stress; education and usefulness of knowledge; and ability to obtain neighbourhood help⁵. Table 1. shows that in the sample, among all the empirical maximums, the indicator of mental comfort was the lowest of all partial indicators, while the standard deviation was the smallest.

³ The research is a part of project financed by "National Science Centre, Poland" no. 2015/19/B/HS4/02273 (Measuring relative performance of farms representing a different level of conformance with Sustainable Development).

⁴ The FADN database in Poland covers 12.1 thousand respondents representing 730 thousand farms whose standard production value exceeds 4 thousand euro, that is it covers only commercial farms.

⁵ The remaining partial indicators were constructed basing on the following variables: **economic potential** – property, labour productivity, production value, agricultural area, work profitability, return on capital, stability of income, independence of income from financial support, financial independence; **production potential** – soil quality, risk of water and wind erosion, water conditions, content of nutrients in soil, soil acidification, natural sites; **environmental perception** – impact of agriculture on the environment, knowledge about the concept of sustainable agriculture, environmental requirements; **correctness of agricultural practice in plant production** – soil examination, parameters of chemical plant protection, the basis for determining the mineral fertilisation dose, incorporating manure, catch crops, rules for plant selection, agri-environmental programmes, the basis for the decision on the chemical plant protection treatment, correctness of the use of sprayer, incorporation of straw, prevention of loss of water from soil, seeds; **correctness of agricultural practice in animal production** – conditions in the livestock building, slipperiness of floors, aggressiveness of animals, separated pens, disinfection of rooms, intensity of stocking; **living conditions** – sewage system, gas system, location, housing conditions. Detailed information on methods and exact parameters used for the construction of all these variables can be found in (Sulewski, Kloczko-Gajewska 2018).

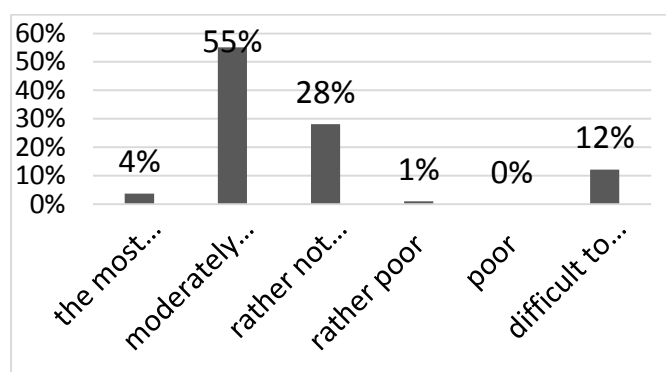
Table 1

Basic characteristics of partial indicators (sub-dimensions) (theoretical range of variability 0-1)

Parameter	Partial indicators						
	Economic potential	Production potential	Environmental perception	Correctness of agricultural practice in plant production	Correctness of agricultural practice in livestock production	Living conditions	Mental comfort
empirical minimum	0.07	0.05	0.06	0.05	0.26	0.24	0.20
empirical maximum	0.92	0.93	1.00	0.97	0.99	1	0.77
mean	0.51	0.50	0.67	0.51	0.61	0.61	0.53
Standard deviation	0.20	0.18	0.19	0.17	0.15	0.15	0.09

Source: authors' research

In order to describe the farmers' social status the respondents were asked to self-assess their affluence, in comparison with the rest of the village inhabitants (Figure 1).



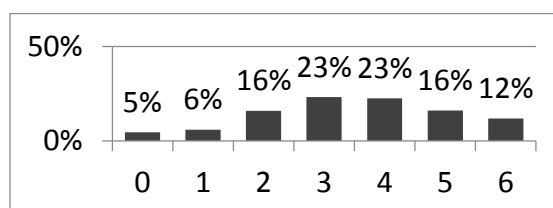
Source: authors' research

Fig. 1. How would you describe your financial situation in comparison to the rest of the village inhabitants?

A bit more than half of the farmers described themselves as „moderately affluent“, 28 % as „rather not affluent“, and almost 4 % as „the most affluent“, while 12 % had problems with this assessment.

We were not able to check the health status of the respondents, but we think that for mental comfort a subjective opinion could be more important, than the actual state. When asked about their health, ¾ of the farmers described it as „rather good“, while approximately 9 % as „rather bad“, and similar amount as „very good“. Just few respondents chose „very bad“.

Free time and workload were assessed with the use of few different parameters. The first of them was a subjective feeling of being overloaded with work on a farm and following it stress (Figure 2).



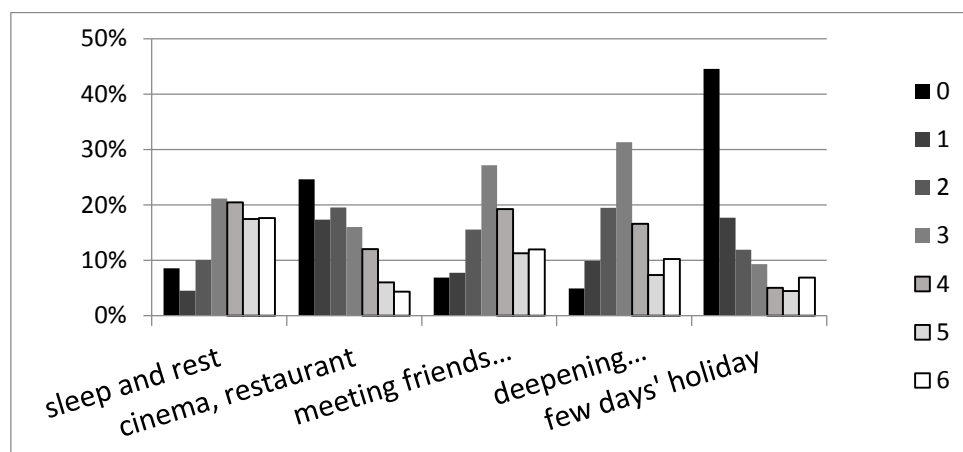
Source: authors' research

Fig. 2. How often do you feel overloaded with work on a farm and following it stress? (0- not at all, 6 – very often)

It is visible that the two highest marks were given by 28 % respondents, while two lowest marks by 10 % of them, which suggests that farmers are quite often overworked and under stress. As many as 70 %

of the respondents faced during last two years a situation, when they seriously delayed agricultural operations on their farm. In $\frac{3}{4}$ of the cases the reason was unfavourable weather, but in 15 % it was caused by work overload on the farm, in 6 % off-farm job, and in 7 % - health problems.

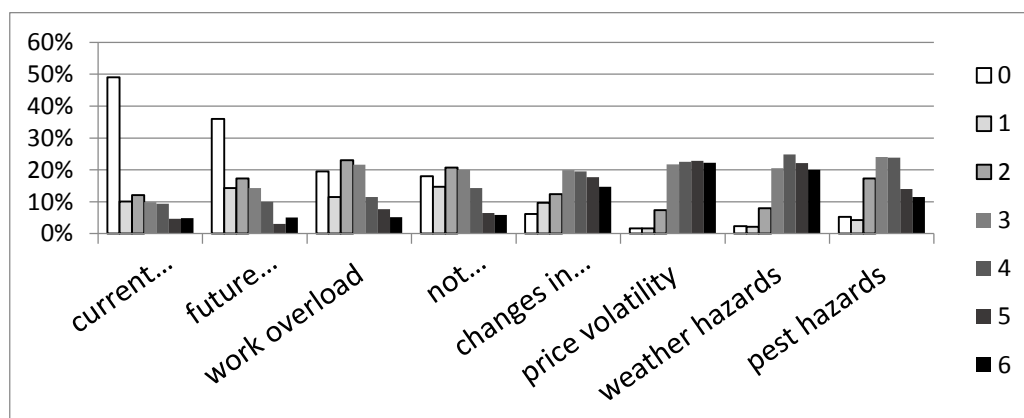
To understand the problem of work overload more deeply, we have asked if the farmers had enough time for sleep and rest, going out, deepening their knowledge concerning farming, and meeting with friends (Figure 3). When we compare how they devote their time to these activities, we can also see the priorities of the farmers.



Source: authors' research

Fig. 3. How do you assess how much time do you have for the following activities? (0 - definitely not enough time, 6 - definitely enough time)

We can see that farmers usually have enough time for sleep and rest, the next higher assessments have been assigned to meetings with friends and family, followed by deepening knowledge about farming. It is worrying that as many as 25 % of farmers definitely do not have enough time to go out to a restaurant or to the cinema (about 40 % if we add the second group), and almost 45 % (or 60 % for two lowest answers) do not have enough time for a few days holiday. Problems with keeping the work-life balance was observed also by Hennessy et al. (2013) on a representative sample of Irish farmers. Coming back to Polish sample, it is interesting that at the same moment $\frac{3}{4}$ of the respondents declared that they did not need to hire additional workers, while about 9 % could not find appropriate people in the neighbourhood, and 10 % found it too costly. It seems that the farmers, although overworked, do not find it easy to hire additional people. Maybe they are afraid of cooperation with someone outside of the family, or they just do not like changes.

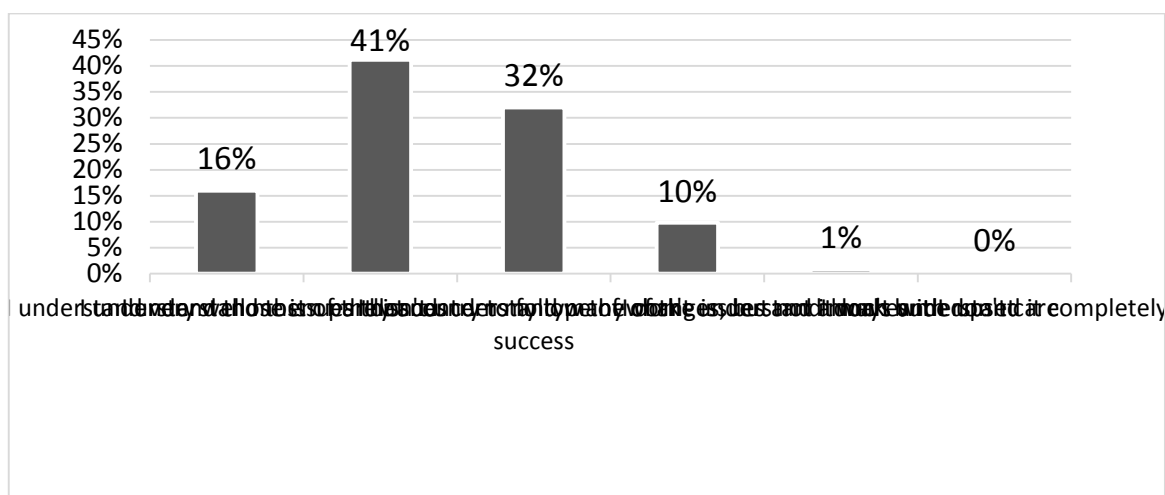


Source: authors' research

Fig. 4. How often do you feel stressed about the following issues? (0 - never; 6 - very often)

Let us now describe the level of stress faced by the farmers (Figure 4). The least stress they feel about their current and future indebtedness (answer „never“ was given by 49 % and 36 %, respectively). About 1/5 of the respondents felt stressed „very often“ by price volatility and weather hazards, followed by changes in law regulations (15 %), and pest hazards (11 %). It seems that the farmers feel less stress when they can manage the risk (such as debts), in comparison with the changes that are beyond their influence (weather, law regulations, market risks).

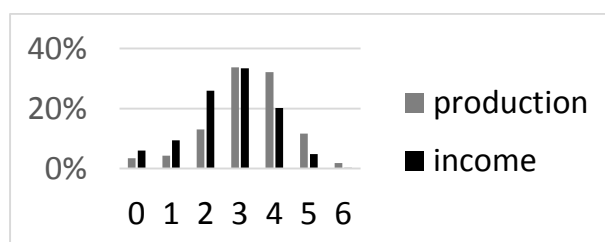
We wanted to get more information on their understanding of the economy and regulations concerning agriculture (Figure 5).



Source: authors' research

Fig. 5. **How do you assess your understanding of current situation in agriculture and economy (such as prices, single area payments, EU regulations)?**

Over 40 % of the respondents declared that they understand the issues that concern their type of production, additional 16 % understand very well most of the regulations. Even if this is only a subjective feeling, they do not feel stress about it. The next 32 % declare that they understand these issues partly and try to follow the changes, but not always with success. 10 % are upset with the fact that they cannot understand the regulations and mechanisms, while almost 1 % understand little, but do not care.

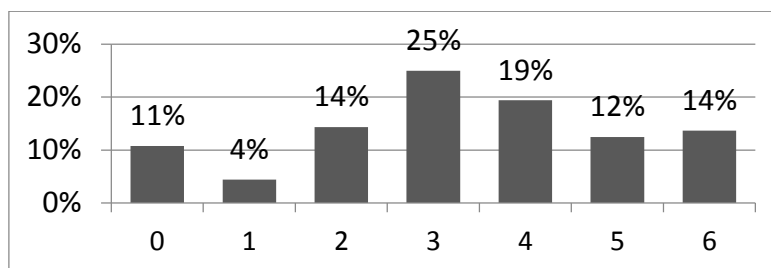


Source: authors' research

Fig. 6. **How do you assess the stability of your production and of your income during last few years? (0 –very unstable, 6- very stable)**

The distribution of stability of production and of income was close to normal, with a bit more stability in the case of production (Figure 6.)

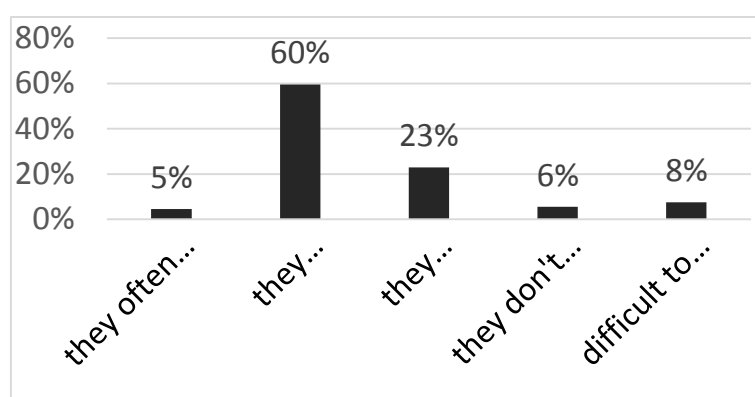
We also checked how much of the stress is connected with the environmental restrictions connected with farming. It came out that only 13 % of the farmers found environmental restrictions easy to implement. As many as 58 % found the regulations important, but troublesome, and as many as 24 % claimed that these regulations should be definitely less restrictive.



Source: authors' research

Fig. 7. How useful in your work on the farm is the knowledge you got during formal education? (0 – useless, 6 – very useful)

The assessment of the usefulness of knowledge acquired during education (Figure 7) was supposed to reflect a possible frustration following devoting time to learning issues not used in practice. The distribution was rather even, with a peak in the middle answer, and a bit more votes for usefulness than uselessness of the knowledge.



Source: authors' research

Fig. 8. Do people in your village help each other?

As many as 65 % of the respondents could count on help from other villager, if needed, and additional 23 % could receive help „sometimes“ (Figure 8).

Table 2

The levels of „mental comfort“ index according to the level of education of the respondents

	primary	vocational	secondary	higher
Minimum	0.21	0.23	0.3	0.28
Average	0.45	0.52	0.54	0.56
Maximum	0.61	0.76	0.74	0.77
Standard deviation	0.105	0.09	0.092	0.094

Source: authors' research

The level of mental comfort was positively correlated with the level of education of the respondents (Table 2). The analysis of variance (ANOVA) revealed that the differences between average indicator of mental comfort depending on the educational level were statistically significant ($p=0.000001$).

The farmers who chose the answer „cooperating with other people allows for achieving more, than working on your own“ scored on average 0.55, while those who chose „cooperation is usually a waste of time“ or „difficult to say“ scored on average 0.51. Those who made the decisions on the farms usually on their own scored 0.51, while those who did it together with the family and the workers or at least listened to their opinions scored 0.54 and 0.55, respectively.

As it was written in the beginning, the index of „mental comfort“ was, together with an index of live conditions, a part of an aggregated index of social dimension of sustainability. The correlation between

these two sub-indices was statistically insignificant, which means that including the index of „mental comfort“ in the sustainability index allows for including new information in the analyses. We could observe low (from 0.23 to 0.32), but statistically significant positive correlations between the index of mental comfort and such indicators of the economic size of the farm, as: farm assets, equity capital, farm income, production value, and the area of agricultural land (this is a result different than obtained in the USA studies, where subjective well-being of the farmers was not significantly correlated with size of the farms (Coughenour, Swanson, 1992). The age of the farmer, number of years in farming or number of years as an independent farm manager were not significant. The farmers who declared that they avoid taking credits or try to keep some cash „for a rainy day“ were more likely to receive high grades in the mental comfort index (correlations 0.19 and 0.14, respectively).

Conclusions

In the sample, the composite indicator of mental comfort reached levels between 0.2 and 0.77 (with possible range 0 to 1), and an average 0.53. The distribution was close to normal, with a visible majority of the sample in the middle. The index of mental comfort and the index of living conditions were not correlated, which means that including the „mental comfort“ in the sustainability index allows for adding new information to the analyses. We could observe low but statistically significant positive correlations between the index of mental comfort and a set of indicators of the economic size of the farm.

As for the parameters included in the index, their distributions depended on particular questions. As we could observe, the farmers are moderately stressed. They feel less stress when they can manage the risk (such as debts), and more when they have no influence on the situation (weather, law regulations, market risks). It seems that the farmers, although overworked, do not find it easy to hire additional people. Most of them are usually able to have enough (or almost enough) rest or meet with friends, but it is difficult for them to leave the farm, especially for few days. It could be a real lack of time or a problem in approach (leaving the farm without the manager).

Over 40 % of the respondents declare that they understand the issues that concern their type of production, additional 16 % understand very well most of the regulations, but 32 % were not able to follow some of the regulations, which made them frustrated. If we take into account that these are only farmers producing for the market (FADN sample), and not subsistent ones, we see that there is a problem – either in the form in which the regulations are presented or in the speed in which they are changing. As many as 58 % found the environmental regulations important, but troublesome in implementing.

The level of mental comfort was positively correlated with the level of education of the respondents. The farmers who chose the answer „cooperating with other people allows for achieving more, than working on your own“ had on average slightly higher score, than those who chose „cooperation is usually a waste of time“ or „difficult to say“. This might be a result of general open-mindedness and belief in other people.

Bibliography

1. Bacon, C. M., Getz, C., Kraus, S., Montenegro, M., Holland, K. (2012). The Social Dimensions of Sustainability and Change in Diversified Farming Systems. *Ecology and Society* 17(4): 41.
2. Balbi, S., del Prado, A., Gallejones, P., Geevan, Ch. P., Pardo, G., Perez-Miñana, E., Manrique, R., Hernandez-Santiago, C., Villa, F. (2015). Modelling Trade-offs among Ecosystem Services in Agricultural Production Systems. *Environmental Modelling & Software*, Vol 72, pp. 314-326.
3. Bebbington, J., Dillard, J. (2009). Social Sustainability: an Organizational-level Analysis. In: Dillar, J., Dujon, V., King, M.C. (eds) „Understanding the Social Dimension of Sustainability“. London: Routledge.
4. Campbell, H., Fairweather, J., Hunt, L., McLeod, C., Rosin, Ch. (2004). Social Dimensions of Sustainable Agriculture: a Rationale for Social Research in ARGOS. ARGOS Working Paper No. 1.
5. Coughenour, C. M., Swanson, L. (1992). Determinants of Farmers' Satisfaction with Farming and with Life: a Replication and Extension. *Southern Rural Sociology*, Vol. 9 No. 1, pp. 45-70.

6. FADN. (2008) Plan wyboru próby gospodarstw rolnych Polskiego FADN 2008 (Plan of Sampling for Polish FADN). Warsaw: IERIGZ-PIB.
7. Galdeano-Gomez, E., Perez-Mesa, J.C., Godoy-Duran, A. (2016). The Social Dimension as a Driver of Sustainable Development: the Case of Family Farms in Southeast Spain. *Sustain. Sci.* Vol. 11, pp. 349–362.
8. Greiner, R. (2015). Motivations and Attitudes Influence Farmers' Willingness to Participate in Biodiversity Conservation Contracts. *Agricultural Systems* Vol. 137 pp.154–165.
9. Hennessy, T., Buckley, C., Dillon, E., Donnellan, T., Hanrahan, K., Moran, B., Ryan, M. (2013): Measuring Farm Level Sustainability with the Teagasc National Farm Survey. Carlow, Ireland: Teagasc.
10. Latruffe, L., Diazabakana, A., Bockstaller, Ch., Desjeux, Y., Finn, J., Kelly, E., Ryan, M., Uthes, S. (2016). Measurement of Sustainability in Agriculture: a Review of Indicators. *Studies in Agricultural Economics*, Vol. 118, pp. 123-130.
11. Lowrance, R., Hendrix, P. F., Odum, E. P. (1986). A Hierarchical Approach to Sustainable Agriculture. *American Journal of Alternative Agriculture*. Vol.1, pp.169-173.
12. Mikul, A., (2016). Zrównowazony rozwój w krajach Unii Europejskiej – obszar integracji społecznej (Sustainable Development in the European Union Member States – the Area of Social Inclusion), *Konsumpcja i rozwój*, Vol. 1 (14), pp.5-18.
13. Mikula, A., (2017). Sustainable Development of Rural Areas in Poland. *Competitiveness of European Agriculture and Food Sectors : Proceedings of the 26th International Scientific Conference*, September 13 - 15, 2017 Prague, Czech Republic. - Prague : Czech University of Life Sciences Prague, 2017. – pp. 226-232.
14. Neyman, J. (1934). On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection. *Journal of the Royal Statistical Society* Vol. 97, pp.558-625.
15. Pearce, D. (1993). *Economic Value and the Natural World*. London: Earthscan.
16. Raczowska, M. (2017). Spójność społeczna na obszarze Unii Europejskiej (Social Cohesion in the European Union), *Research Papers Of Wrocław University Of Economics* No 475, pp.258-269.
17. Reyntar, K., Hanson, C., Henninger, N. (2014). Indicators of Sustainable Agriculture: a Scoping Analysis. Instalment 6 of „Creating a Sustainable Food Future”. World Resources Institute.
18. Sachs, I. (2011) *Trzeci brzeg. W poszukiwaniu ekorozwoju. (The Third Shore. Looking for Sustainable Development)*. Warszawa: Wydawnictwo Uniwersytetu Warszawskiego.
19. Spindler, E. (2013). *The History of Sustainability. The Origins and Effects of a Popular Concept*. In: Jenkins, I., Schroder, R. (eds), „Sustainability in Tourism”. Wiesbaden: Springer Gabler.
20. Sulewski, P., Kloczko-Gajewska, A. (2018). Development of the Sustainability Index of Farms Based on Surveys and FADN Sample. *Problems of Agricultural Economics*. Vol. 3, pp. 32-56.
21. Thompson, P. (2007). Agricultural Sustainability: What It Is and What It Is Not. *International Journal of Agricultural Sustainability*. 5:1, pp. 5-16.
22. Vehkamäki, S. (2005). The Concept of Sustainability in Modern Times. In: Jalkanen, A., Nygren, P. (eds), *Sustainable Use of Renewable Resources — from Principles to Practices*. University of Helsinki Department Ecology Publications 34.
23. Was, A. (2013). Modelowanie przemian strukturalnych polskiego rolnictwa (Modelling of Structural Changes in Polish Agriculture). Warszawa: Wydawnictwo SGGW.
24. World Commission on Environment and Development. (1987). *Our Common Future*. Oxford: Oxford University Press.
25. *Wykluczenie i integracja społeczna w Polsce. Ujęcie wskaźnikowe*, (Social Exclusion and Social Integration in Poland. An Index Approach). Raport, 2006, Warszawa.

FACTORS AFFECTING GARLIC PRODUCTION IN LATVIA

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Abstract. The population of Latvia is increasingly interested in the production of garlic both for self-consumption and for sales in the market. The research puts forward the following hypothesis: garlic production is affected by economic and production factors of diverse significance. The research aims to examine the factors affecting the production of garlic in Latvia. The specific research tasks are as follows: (1) to give the characteristics of garlic production in Latvia; (2) to identify and assess the factors affecting the production of garlic in Latvia. The research has found that in Latvia, garlic was grown in small areas as an auxiliary crop, mainly in Zemgale region representing 54 % of the total garlic area as well as in Pieriga region (16 %), as garlic is a resource-intensive crop and sensitive to weather conditions and soil composition. Consequently, soils tests have to be done and a number of garlic varieties have to be field-tested for several years before starting growing this crop in order to identify the best variety for the field and the best garlic growing technology. Five most significant factors affecting garlic production in Latvia were as follows: (1) large financial investments are needed to start growing garlic (expert rating 0.84), (2) quality and availability of planting material (0.66), (3) soil composition (0.50), (4) weather conditions (0.47) and (5) labour intensity (0.44). In the analysis period of 2013-2016, Latvia annually imported approximately 900 t of garlic, i.e. more than the country produced this commodity. The Netherlands and Spain were the most significant importers of garlic into Latvia, accounting for more than 85 % of the total imports of garlic.

Key words: garlic, yield, factors, open field vegetables.

JEL code: Q13, M11, O13.

Introduction

The European Commission (2017) has stressed in its communication „The Future of Food and Farming“ that „unlike most other economic sectors, farming is strongly affected by the **weather**; it is also frequently tested by **volatile prices, natural disasters, pests** and **diseases** – with the result that, every year, at least 20 % of farmers lose more than 30 % of their income compared with the average of the last three years... **Climate change** threatens to make all of the above-mentioned problems weigh more heavily“. The Common Agricultural Policy (CAP) is one of the EU action policies, the purpose of which is to ensure what the population expects in relation to food; therefore, in its communication the European Commission (2017) also stressed that the CAP should continue to **support production with specific and valuable characteristics** through Rural Development as well as to promote and improve its international recognition. One more function of the CAP is to ensure **nutritious valuable products** are easily available for EU citizens (European Commission, 2017). The authors of the paper believe that one of the most valuable agricultural products – with ancient growing traditions in the world and Europe – is garlic. During the interviews conducted by the authors, the garlic producers and experts also pointed out the growing interest of the population of Latvia in the production of garlic for both self-consumption and the market. In Latvia, the output of garlic fluctuated over the analysis period owing to various circumstances and factors. Even though there are all the necessary preconditions for garlic production in Latvia, the data on the area under garlic and the output and average yield of garlic indicate that there are factors hindering domestic garlic producers from approaching the levels reported in the largest garlic producers: China, India, Spain etc.

The research hypothesis is as follows: garlic production is affected by economic and production factors of diverse significance. The research aims to examine the factors affecting the production of garlic in Latvia.

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The specific research tasks are as follows: (1) to give the characteristics of garlic production in Latvia; (2) to identify and assess the factors affecting the production of garlic in Latvia.

The research employed **general scientific methods** (monographic, graphical, logical construction and synthesis and analysis), **sociological methods** (document analysis, expert surveying and interviewing) and **statistical analysis** (time series analysis and Pearson correlation analysis). The period of 2013-2017 was chosen to identify trends in garlic production.

The research used the data of the Food and Agriculture Organization of the United Nation (FAO), the Central Statistical Bureau (CSB) of Latvia, the Latvian Rural Advisory and Training Centre, the State Plant Protection Service and the Rural Support Service, publications by the Ministry of Agriculture as well as a research study by I.Missa (2013) on garlic production under the conditions in Latvia. A number of garlic producers and experts were interviewed in Latvia to acquire primary information.

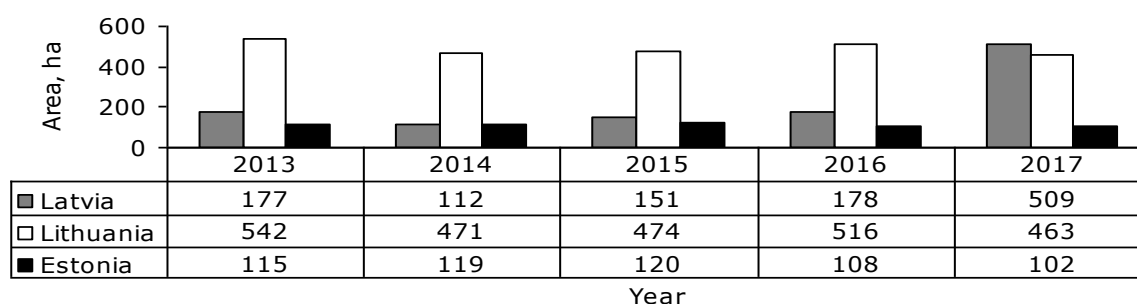
Research results and discussion

1. Garlic area analysis

The world leader in garlic production in terms of cropped area and output is China. The output of garlic in China is almost 15-fold higher than that India, which is the second largest garlic producer in the world, and more than 60-fold higher than that in the European Union as a whole. Chinese garlic producers, having favourable climatic conditions, suited soils and experience, applying high fertiliser rates and practicing a two-fold higher plant density, acquire higher garlic yields – 27 t/ha (2017) (Missa, 2013; FAOSTAT, [s.a.]).

Spain is the largest producer of garlic in the EU, accounting for more than half of the total EU output of garlic. In 2017, Spain produced 274 712 t of garlic or 87 % of the total EU output, while the garlic area was 26 630 ha or 56 % of the total area cropped with garlic in the EU (FAOSTAT, [s.a.]).

In Latvia, garlic is mainly grown as an auxiliary crop on farms, household plots and family farms. In 2018 in Latvia, according to the Register of Fruit, Berry and Vegetable Producers of the State Plant Protection Service, there were 81 garlic producers: 44 private persons, 15 family farms, 12 farms and 10 commercial farms. The data of the register are incomplete, as the data are based on the data submitted to the Rural Support Service by individuals who want to receive area payments (State Plant Protection Service, [s.a.]). In 2013, according to the FAO, garlic was produced in Latvia in an area of 177 ha (Figure 1), while the area declared for the area payment scheme was 60.28 ha or only a third of the total (RSS, [s.a.]). In 2014, 44 % of the reported area under garlic (112 ha) was declared for the scheme; in 2015 it was 31 %, while in 2016 – 46 %. In 2017, 135.5 ha under garlic were declared for the scheme, which was the largest area in the analysis period, yet it was only 27 % of the area reported by the FAO (RSS, [s.a.]). Horticultural expert M.Gailite (2017) explains the difference in data by the fact that most of the area under garlic is comprised of small plots, up to 0.3 ha in size, which are managed by a family.



Source: FAOSTAT, [s.a.]

Fig. 1. Garlic areas in the Baltic States in the period 2013-2017, ha

As shown in Figure 1, the garlic area in Latvia rose by 186 % in 2017 compared with 2016, which was a considerable increase, yet the garlic area represented only 6 % of the total area cropped with open field vegetables. Up to 2017 in Latvia, just like in Estonia, garlic has been grown in small areas. A comparison of the garlic areas between Lithuania and Latvia reveals that before 2017, the garlic area was 3-4-fold larger in Lithuania than in Latvia, and No significant changes occurred in the analysis period.

2. Analysis of the factors affecting garlic production

The authors wished to examine the key factors affecting garlic production in Latvia. Based on an analysis of information sources, the authors identified seven factors (Table 1). To assess the factors, the authors involved five industry experts and garlic producers. The influence of a factor was rated on a 3-point scale (1 – insignificant influence; 2 – moderate influence; 3 – significant influence), while the probability of factor change was rated on a 5-point scale (with 1 being the lowest probability; 5 – the highest). Factor significance was calculated by multiplying the influence of a factor by the probability of change for the corresponding factor and then dividing it by the sum of influence ratings (Table 1).

Table 1

Ratings of the factors affecting garlic production in Latvia

Factors	Factor influence rating (1-3 points)	Average expert rating of factor change probability (1-5 points)	Factor significance
1.	2.	3.	$4. = 2. \times 3. / \Sigma 2.$
Large financial investments	3	4.5	0.84
Quality and availability of planting material	3	3.5	0.66
Soil composition	2	4	0.50
Weather conditions	3	2.5	0.47
High proportion of manual work	2	3.5	0.44
Garlic imports	2	2	0.25
Removal of flower stalks	1	2.5	0.16
TOTAL	16	-	-

Source: authors' research

The research results showed that the most significant factor affecting garlic production in Latvia was **large financial investments (0.84)** needed upon starting growing the garlic – for buying planting material and machinery. According to various literature sources, the amount of planting material needed for garlic production is in the range of 0.7-1.8 t/ha. Based on expert recommendations, the Latvian Rural Advisory and Training Centre (LRATC) (2014-2018) has estimates it at 1.0 t/ha. In the interviews, some garlic producers noted even a higher planting rate – 1.4-1.8 t/ha. The wide range of the planting rate for garlic could be explained by the **size of a clove**, which is affected by the garlic variety, and **planting spacing**.

In Latvia, No garlic price monitoring is carried out. The research used information provided by advertisement websites as well as data used by the LRATC. An analysis of the LRATC data (2014-2018) revealed that the purchase price rose by 4.3 % from 4.70 EUR/kg in the period 2013-2016 to 4.90 EUR/kg in 2017. In the interviews, the garlic growers revealed that high-quality planting material cost 4.00-5.50 EUR/kg in the analysis period. In 2018, according to the Baltic Garlic Growers Association ([s.a].a), the price of planting material, depending on the size of a clove, ranged from 3.10 EUR/kg (sized 40/50 mm) to 6.10 EUR/kg (sized 60 mm+) (VAT (21 %) and transport cost excluded). The price of organic planting material was in the range of 7.90-10.35 EUR/kg (VAT (21 %) and transport cost excluded).

Assuming that the planting rate is in the range of 0.7-1.8 t/ha and the average purchase price is 4.90 EUR/kg, the cost of planting material ranges from 3 430 up to 8 820 EUR/ha.

Growing garlic in a very large area requires machinery, as many agricultural operations have to be performed in a short period, and, if the work is large, it is almost impossible to mobilise many employees for a short period. Besides, weather conditions affect the production of garlic (Missa, 2013).

The machinery needed for garlic production could be bought gradually, in line with the financial capacity of the producer. However, producing garlic in a long-term and in a large area requires large investments. Examining the machinery, the authors found that both garlic clove splitting machines and planting machines and garlic harvesters could be bought in Latvia (Baltic Garlic Growers Association, [s.a.]). The authors estimated that at least EUR 21 000-28 000 should be invested: the cost of a splitting machine is about EUR 3 000 (Vitlok B-18), the cost of a garlic planting machine ranges from EUR 1 350 (Renal Sdc 001) to EUR 8 432 (JJ BorchPLMA-2), the cost of a garlic harvester is much higher – EUR 16 500 (Spain firm „ZOCAPI” harvester) (VBC Group, [s.a.]; Baltic Garlic Growers Association, [s.a.]). According to the research by I.Missa (2013), more than EUR 30 000 have to be invested in machinery to mechanise the garlic production process.

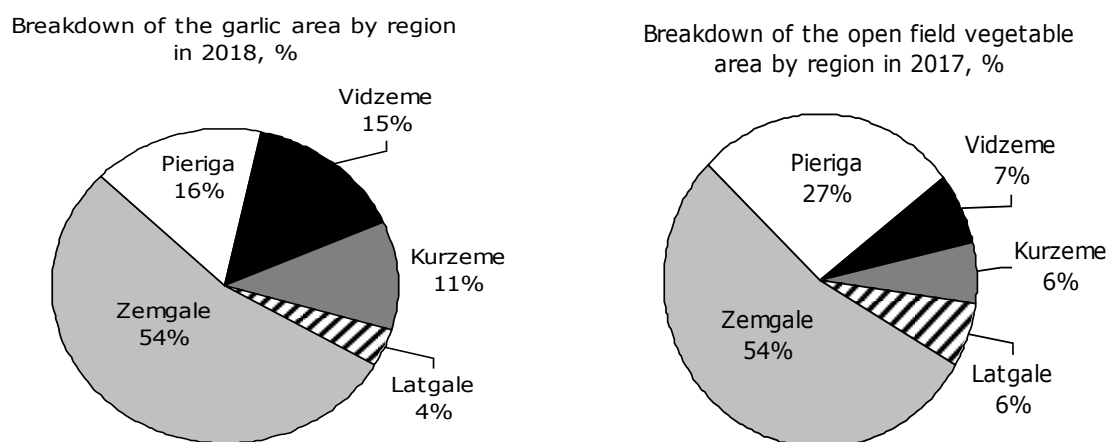
The purchase of garlic planting material is problematic not only because of its high cost but also because No **certified planting material** is available at seed shops. In the interviews, the garlic growers admitted that upon starting growing garlic, they bought a small amount of high-quality certified planting material from official sellers. The remaining amount of planting material they sought to produce themselves.

The research confirmed that the next most significant factor was quality and availability of planting material (0.66). In Latvia, as pointed out by I.Missa (2013), it was difficult to acquire planting material being not infected with grey mould (*Botrytis cinerea*) or other moulds, mites, viruses or nematodes. According to calculations by I.Missa (2013), the loss because of discarding planting material might exceed 50 %. This decreases the amount of planting material and increases the cost of it.

In the period 2013-2015, a research study on domestic garlic producers was done in Lithuania. The research study aimed to compare national garlic varieties with foreign ones and analyse the varieties in terms of productivity and garlic bulb sizes. The research study found that the local variety Ziemiai demonstrated the highest yield, reaching even 12.9 t/ha. In contrast, the garlic varieties imported from Spain, Czech Republic and China performed the worst: 4.5 -9.4 t/ha. The research study has confirmed the findings made by other authors – garlic yields are affected by climatic and environmental conditions, and it is a reason why national varieties of garlic are better suited for the needs of production (Juskeviciene et al., 2016). In the interviews, the garlic growers pointed out that upon starting growing garlic in large quantities, the best option was to try several varieties for a number of years in order to identify the best variety and the best growing technology. I.Missa (2013) believed that the garlic grown in Scandinavia, Great Britain, France, Poland and the Czech Republic was suited for being grown in Latvia.

The production of garlic is affected by **soil composition** (expert rating 0.50) as well. The preconditions for high garlic yields are as follows: a lot of sunlight, enough moisture, a humus-rich, medium-heavy and well-structured soil with a thick arable layer. Besides, it is advised not to grow garlic in the same field earlier than after 3-4 years (Missa, 2013). This is a reason why No farms have presently specialised in garlic production. Since the production of garlic is affected by both the quality of planting material and soil composition, the authors believe that upon starting growing garlic, soils tests have to be done and a number of garlic varieties have to be field-tested in order to identify the best variety for the field and the best garlic growing technology.

An analysis of the Rural Support Service data on the garlic area declared in 2018 showed that the largest areas were reported in Zemgale region as well as Pieriga region (Figure 2). The garlic producers explained it by fertile soils and appropriate weather conditions.



Source: Rural Support Service, [s.a.]; CSB, [s.a.]

Fig. 2. **Percentage breakdown of the areas cropped with garlic and open field vegetables by region in Latvia**

An analysis of the data on the areas under open field vegetables in the regions of Latvia revealed that the same two regions dominated – Zemgale and Pieriga. According to the Ministry of Agriculture (2018), the entire area of Latvia is suited for vegetable production, yet the type of farms was determined by the sales market – mainly the vicinity of cities. To identify whether the garlic areas are related to the sales locations, the authors performed a correlation analysis. The dependent variables were as follows: (1) number of cities and towns in a municipality; (2) population at the beginning of the year; (3) population density in the municipality; and (4) distance to the regional centre. The p-values were above than 0.05 and the correlation coefficients were below 0.3, which meant that there was **No statistically significant correlation between the variables**.

The third factor that considerably affected garlic producers was **weather conditions**. Frost in spring can affect garlic sprouts, which, in turn, affects the yield. Too wet conditions during harvest can contribute to rot and make post-harvest treatment complicated. In contrast, drought at the beginning of the vegetation season affects the ability of garlic to root and later the growth of it (Gailite, 2017). According to the Ministry of Agriculture (2018), farmers prefer growing the crops needing relatively simple technologies and **not depending on meteorological conditions**.

In 2014 in Latvia, weather conditions in winter (No snow) and spring (frost) were not favourable for the production of high-quality garlic; consequently, the average yield and output of garlic decreased (Figure 2) (MoA, 2015). The output of garlic was affected by a decrease in the area cropped with garlic in the country.

Table 2

Output and average yield of garlic and the annual changes therein in the Baltic States in the period 2013-2017

Indicators	2013	2014	2015	2016	2017
Latvia					
Garlic output, tonnes	524	129	680	610	1884
Annual change, %	-	-75	+427	-10	+209
Average garlic yield, cnt/ha	29.6	11.5	45.0	34.3	37.0
Annual change, %	-	-61	+291	-24	+8
Lithuania					
Garlic output, tonnes	2024	1561	1503	1622	970
Average garlic yield, cnt/ha	37.3	33.1	31.7	31.4	21.0
Annual change, %	-	-11	-4	-1	-33
Estonia					
Garlic output, tonnes	206	148	300	185	356
Average garlic yield, cnt/ha	17.9	12.4	25.0	17.1	35.0
Annual change, %	-	-31	+102	-32	+105

Source: FAOSTAT, [s.a.]; authors' calculations

In 2015, however, weather conditions were suitable for garlic production (MoA, 2016); consequently, the average yield of garlic considerably (almost 4-fold) as well as the output of garlic (5.3-fold) increased. The output of garlic increased also owing to an increase of the area under garlic by 35 %.

In 2016, despite an 18 % increase in the garlic area, the output of garlic decreased by 10 %, which might be explained by long-lasting rainfalls in August, which did not allow harvesting high-quality garlic (MoA, 2107). The weather conditions affected the average yield of garlic, which decreased by 24 %.

Even though weather conditions in 2017 were not suitable for garlic production in Latvia (MoA, 2018), the output of garlic rose 3-fold because the area cropped with garlic increased 2.9-fold. The average yield of garlic rose by 8 %.

A comparison of the average yields of garlic among the Baltic States reveals that the average yield was lower in Estonia than in Latvia, yet the trend was similar. In her research, Vahejoe et al. (2011) found that the garlic yield in Estonia could considerably vary by variety and growth conditions and could reach 30–50 cnt/ha. This means that only in 2017 average garlic yields were achieved in Estonia. In the analysis period in Lithuania, the average yield of garlic gradually decreased, and since 2015 it has been lower than that in Latvia.

According to I.Missa (2013), a normal garlic yield harvested under the conditions in Latvia could be in the range of 50-90 cnt/ha, which is 1.6-3-fold more than on average in the analysis period. If a garlic field is watered, according to I.Missa, one can harvest 150 cnt/ha of high-quality garlic.

A comparison of the average yield with the amount of planting material (7-18 cnt/ha) in the analysis period reveals that the yield is 2-6-fold higher than the amount of garlic planted, except for 2014 when the average yield was the lowest, and it was likely that garlic producers suffered losses. According to calculations by I.Missa (2013), a yield of 30 cnt/ha or lower brings losses to garlic producers.

In the interview, LRATC specialist M.Narvils stressed that in view of the climatic conditions in Latvia, mulching the field could be a solution that positively affects garlic growth because it contributes to microbiological activity in soil and in a cold snowless winter garlic plantations are not damaged, while in

hot summer the mulch keeps moisture. The application of mulch has not been sufficiently examined in Latvia.

The experts pointed out that garlic production is **labour intensive**. This might be one of the reasons why the garlic area in Latvia in the period 2013-2016 comprised only approximately **2 % of the total area under open field vegetables**. In 2017, the proportion rose to 6 % (FAOSTAT, [s.a.]; CSB, [s.a.]).

According to calculations by I.Missa (2013), managing a hectare under garlic requires 400-500 hours of manual work (50-63 man-days), of which 100 hours (12-15 man-days) are required for preparing planting material, 200 hours (at least 25 man-days) for harvesting and post-harvest treatment. Soil tillage and transport by means of machinery requires 20-30 hours.

I.Missa (2013) also point out that if a lot of cloves have to be discarded, preparing planting material could require at least 240 hours or 30 man-days. This implies that managing a hectare under garlic could require more than 600 hours of manual work or 75 man-days. A mechanised process of garlic bulb splitting, depending on machinery, allows processing 250-1000 kg of garlic or 10 times more than an employee can do during a working day.

As pointed out by I.Missa (2013), planting garlic is worth mechanising only if a large area is involved because planting garlic by means of a potato planter decreases yield by up to 10 %, and only large-scale production makes the yield decrease insignificant relative to manual work input.

In the period 2013-2016, Latvia annually imported approximately 900 t of garlic, which exceeded the annual output of it in the country. However, in 2014 Latvia imported seven times more garlic than it produced this product. In the analysis period, the imports of garlic were steady, and the Netherlands and Spain were the most significant importers of garlic into Latvia, accounting for more than 85 % of the total imports of garlic. According to FAOSTAT ([s.a.]), the Netherlands, Spain as well as China and Argentina were the largest garlic exporters in the world. Garlic from China, however, was imported in small quantities.

Table 3

Imports of garlic in absolute and relative terms by country in Latvia in the period 2013-2016

Countries	2013		2014		2015		2016	
	Quantity, t	Percentage	Quantity, t	Percentage	Quantity, t	Percentage	Quantity, t	Percentage
Netherlands	461	51.1	344	38.6	441	51.7	407	45.2
Spain	316	35.0	417	46.7	317	37.2	384	42.7
Lithuania	94	10.4	57	6.4	36	4.2	25	2.8
China	21	2.3	51	5.7	17	2.0	16	1.8
Hungary	3	0.3	9	1.0	9	1.1	20	2.2
Italy	2	0.2	1	0.1	2	0.2	3	0.3
France	2	0.2	1	0.1	1	0.1	0	0
Estonia	2	0.2	0	0	0	0	1	0.1
United Kingdom	1	0.1	1	0.1	0	0	0	0
Ukraine	0	0	0	0	22	2.6	26	2.9
Sweden	0	0	8	0.9	1	0.1	0	0
Poland	0	0	3	0.3	7	0.8	18	2.0
Total imports	902	100	892	100	853	100	900	100

Source: FAOSTAT, [s.a.]

Some part of the garlic produced in Latvia and, perhaps, imported garlic is exported. The exports of garlic are insignificant: 2-3-fold smaller than the imports; therefore, the balance of trade in garlic was negative in the entire analysis period: in monetary terms, the imports exceeded the exports more than two times. Most of the garlic (more than 80 % in the analysis period) was exported to the neighbouring countries – Lithuania and Estonia.

As pointed out by I.Missa (2013), the problem of imports of garlic became urgent in Latvia in 2003 when the imports of cheap garlic rose and meat processors and other food producers in Latvia shifted to using dried garlic powder. In 2008 in the world, many countries increased garlic output, and it affected domestic garlic producers, as the garlic was exported at low prices to many countries, including Latvia.

A less significant factor affecting garlic production was **removal of flower stalks** (0.14). Flower stalks may not be cut too early in order not to infect the stalk cut, as well as not too late because it affects the yield of garlic. It is believed that the flower stalks not cut timely decrease the yield by 20-30 %; otherwise, nutrients accumulate in the flower stalks instead of the garlic bulb growing in soil (Missa, 2013). In the interviews, the garlic producers admitted that flower stalks had to be cut manually even in the case of conventional practices, and in the future this operation is not going to be mechanised. A solution could be the choice of garlic varieties not developing flower stalks, e.g. Germidour and Messidour.

Conclusions, proposals, recommendations

- 1) In Latvia, garlic was grown in small areas as an auxiliary crop, mainly in Zemgale region as well as in Pieriga region, as garlic is a resource-intensive crop and sensitive to weather conditions and soil composition. Consequently, soils tests have to be done and a number of garlic varieties have to be field-tested for several years before starting growing this crop in order to determine the best variety for the field and the best garlic growing technology.
- 2) In the analysis period of 2013-2016, Latvia annually imported approximately 900 t of garlic, i.e. more than the country produced this commodity. The Netherlands and Spain were the most significant importers of garlic into Latvia, accounting for more than 85 % of the total imports of garlic.
- 3) Five most significant factors affecting garlic production in Latvia were as follows: (1) large financial investments are needed to start growing garlic (expert rating 0.84), (2) quality and availability of planting material (0.66), (3) soil composition (0.50), (4) weather conditions (0.47) and (5) labour intensity (0.44).
- 4) In order for garlic production to become a prospective agricultural activity, current and future garlic producers have to be educated on the specifics of garlic production and the key factors.
- 5) National data on garlic areas and yields are incomplete; therefore, the Baltic Garlic Growers Association could assume responsibility for collecting relevant statistics.

Bibliography

1. Baltic Garlic Growers Association ([s.a.]a) *Garlic Planting Material Prices in 2018*. Retrieved: <http://www.bgga.lv/node/83>. Access: 02.02.2019.
2. Baltic Garlic Growers Association ([s.a.]b) *Machinery and Equipment for Garlic Production*. Retrieved: <http://www.bgga.lv/node/53>. Access: 02.02.2019.
3. Central Statistical Bureau of Latvia (CSB) ([s.a.]). *Statistics Database*. Retrieved: <https://www.csb.gov.lv/en/statistika/db>. Access: 02.02.2019. (Tables ISG040, GZG011, LAG030)
4. Diezina, S. (2015). *Ziemas kiplokus audzet ir izdevigi, tacu jarekinas ar lieliem ieguldijumiem (Winter Garlic Production is Profitable, yet Large Investment is Needed)*. Retrieved: <http://www.la.lv/garsaugu-karalis-visrentablakais>. Access: 02.02.2019.
5. European Commission (2017). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions „The Future of Food and Farming”. Brisele, 29.11.2017. COM(2017) 713. Retrieved: https://ec.europa.eu/agriculture/sites/agriculture/files/future-of-cap/future_of_food_and_farming_communication_lv.pdf. Access: 02.02.2019.

6. FAOSTAT ([s.a.]). *Data*. Retrieved: <http://www.fao.org/faostat/en/#data>. Access: 02.02.2019.
7. Gailite, M. (2017), *Pasaules kiploku tirgus ietekme cenas Latvijā (World Garlic Market Affects Prices in Latvia)*. AGRO 2017, No. 4, pp. 86-87.
8. Juskeviciene, D., Karkleliene, R., Radevicius, A., Sasnauskas, A. (2016). *Productivity and Morphological Features of Garlic (Allium Sativum L.) Grown in Lithuania*. Agriculture & Forestry 2016, No. 62, pp. 109-116.
9. Latvian Rural Advisory and Training Centre (LRATC) (2014). *Bruto seguma apreķins zemnieku saimniecībai 2013.gada (Contribution Margin Calculations for a Farm in 2013)*. Retrieved: http://new.llkc.lv/sites/default/files/baskik_p/pielikumi/brutosegums2013.gada_.pdf. Access: 02.02.2019.
10. Latvian Rural Advisory and Training Centre (LRATC) (2015). *Bruto seguma apreķins zemnieku saimniecībai 2014.gada (Contribution Margin Calculations for a Farm in 2014)*. Retrieved: http://new.llkc.lv/sites/default/files/baskik_p/pielikumi/bruto_segums_internetam_mb.pdf. Access: 02.02.2019.
11. Latvian Rural Advisory and Training Centre (LRATC) (2016). *Contribution Margins. Garlic (Winter). 2015*. Retrieved: http://new.llkc.lv/sites/default/files/baskik_p/pielikumi/kiploki_3.pdf. Access: 02.02.2019.
12. Latvian Rural Advisory and Training Centre (LRATC) (2017). *Contribution Margins. Garlic (Winter). 2016*. Retrieved: http://new.llkc.lv/sites/default/files/baskik_p/pielikumi/kiploki_5.pdf. Access: 02.02.2019.
13. Latvian Rural Advisory and Training Centre (LRATC) (2018). *Contribution Margins. Garlic (Winter). 2017*. Retrieved: http://new.llkc.lv/sites/default/files/baskik_p/pielikumi/kiploki_ziemas_0.pdf. Access: 02.02.2019.
14. Rural Support Service (RSS) ([s.a.]). *Statistika. Platību maksājumi (Statistics. Area Payments)*. Retrieved: <http://www.lad.gov.lv/lv/statistika/platibu-maksajumi/>. Access: 02.02.2019.
15. Missa, I. (2013). *Kiploku audzēšana Latvijas apstākļos (Garlic Production under the Conditions in Latvia)*. Ozolnieki: Latvian Rural Advisory and Training Centre Ltd, 51 p.
16. Vahejoe K., Luik H., Karp K., Poldma P. (2011). *Darzkopības rokasgrāmata (burkāni, kiploki, dobju gurķi, zemenes, darza mellenes, upenes) (Horticulture Handbook (Carrot, Garlic, Cucumber, Strawberry, Garden Blueberry, Blackcurrant))*. Retrieved: <http://www.apesnovads.lv/wp-content/uploads/2012/03/D%C4%81rzkop%C4%ABbas-rokasgr%C4%81mata.pdf>. Access: 02.02.2019.
17. State Plant Protection Service (SPPS) ([s.a.]). *Auglkoķu, ogulāju un dārzēnu audzētāju reģistrs (Register of Fruit, Berry and Vegetable Producers)*. Retrieved: <http://www.vaad.gov.lv/sakums/registri/audzetaju-registrs.aspx>. Access: 02.02.2019.
18. VBC Group ([s.a.]). *Sejmasīnas stādīšanai (Sowing Machines for Planting)*. Retrieved: http://www.vbc.lv/sejmasinas_stadisana. Access: 11.27.2018.
19. Ministry of Agriculture of the Republic of Latvia (MoA) (2015). *Latvijas lauksaimniecība 2015 (Agriculture of Latvia 2015)*. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/63/66/LS_gadazinojums_2015.pdf. Access: 02.02.2019.
20. Ministry of Agriculture of the Republic of Latvia (MoA) (2016). *Latvijas lauksaimniecība 2016 (Agriculture of Latvia 2016)*. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/00/90/30/fs-01usersLinda.BirinaDesktopAA2016_lauksaimniecibasgadazinojums.pdf. Access: 02.02.2019.
21. Ministry of Agriculture of the Republic of Latvia (MoA) (2017). *Latvijas lauksaimniecība 2017 (Agriculture of Latvia 2017)*. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/01/10/04/fs-01usersLinda.BirinaDesktopAA2017_lauksaimniecibasgadazinojums.pdf. Access: 02.02.2019.
22. Ministry of Agriculture of the Republic of Latvia (MoA) (2018). *Latvijas lauksaimniecība 2018 (Agriculture of Latvia 2018)*. Retrieved: https://www.zm.gov.lv/public/files/CMS_Static_Page_Doc/00/00/01/33/19/Gadazinojums.pdf. Access: 02.02.2019.

REGIONAL DIVERSITY OF ORGANIC FOOD SALES IN THE EUROPEAN UNION

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Abstract. The article discusses regional differences on the organic food market in the European Union based on retail sales data. The analysis was based on Eurostat, FiBL, IFOAM, USDA and literature data for 2016. Selected descriptive statistics were used. The analysis demonstrated considerable regional differences in both total and per capita retail sales of organic food on the EU market, which can be attributed to the unique characteristics of the compared countries. The absolute values of organic retail sales are influenced mainly by population and GDP. Per capita sales are strongly determined by GDP and final consumption expenditure of household. Therefore, organic retail sales were higher in countries with a higher GDP and higher household consumption per capita. Organic food sales and consumption were highest in Germany, France, Italy, the UK and Switzerland. The analysed variables were lowest in Cyprus, Slovakia, Lithuania, Latvia, Bulgaria, Hungary and Estonia.

Key words: organic market, organic farming, UE, organic food consumption, retail sales, expenses.

JEL code: D40, E21, I15, O1, Q13,

Introduction

Public concerns over environmental protection and food safety have been growing in Europe since the mid 1980s (Greenan K., Humphreys P., McIvor R., 1997). Consumers have a growing awareness about the harmful environmental impacts of conventional agriculture and the health implications of highly processed foods. Environmentally- and health-conscious consumers are increasingly likely to buy organic foods (Krystallis A., Chrysoschoidis G., 2005). Organic farming is an agricultural management and production system that combines the most environmentally-sound practices with high levels of biological diversity, protection of natural resources, high animal welfare standards and production methods that meet the consumers' demand for foods produced with the involvement of natural substances and processes (Council Regulation (EC) No 834/2007). Most research studies indicate that consumers are more inclined to buy organic food due to the associated health benefits rather than for environmental reasons. According to most consumers, their purchasing decisions are more likely to be influenced by the unique attributes of organic food products that deliver direct benefits rather than the specific features of the organic production process that deliver indirect benefits for consumers (Wier M., Calverley C., 2002). For this reason, consumers increasingly often turn to foods produced in organic farms. This trend can also be attributed to an increase in disposable incomes in highly developed countries which have the largest organics markets. In contrast, high price premiums continue to suppress the demand for and the consumption of organic foods in less developed countries (Shafie F.A., Rennie D., 2012). Despite the above, the organic food sector has been the most dynamically growing segment of the European agrifood market in the past two decades. The above can be attributed to the high quality of organic foods, environmental concerns, healthy lifestyle and health problems, which are the top reasons given for buying organics (Basha M.B., Mason C., Shamsudin M.F., Hussain H.I., Salem M.A., 2015). At the same time, organic farming area and the number of organic food producers continue to increase despite strict regulations. Organic food production is highly subsidized (Brodziska K., 2015), which does not always contribute to an increase in the supply of organics in less developed countries, including Poland (Pawlewicz A., 2014). Despite the above, the sales of organic raw materials and processed products continue to increase each year around the world. This trend is observed in both highly developed countries as well as in less affluent states. In view of the above, two research hypotheses were tested in this study: H1 – organic retail sales differ across the EU; and H2 –

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organic retail sales are higher in countries with a higher GDP and higher household consumption expenditures. Therefore, the aim of this study was to evaluate the differences on the organic food market in the European Union based on organic retail sales.

In the first stage of the analysis, the research goal was pursued by selecting parameters describing organic retail sales in the EU countries based on statistical data. The analysed parameters were organic retail sales (million €), per capita consumption (€ per capita), organic crop area (fully converted and under conversion to organic farming, ha); area under organic farming (% of utilised agricultural area (UAA)); population, exports of organic foods (million €, for countries where these data were available), main GDP aggregates per capita (€ per capita), final consumption expenditure of households (total – million € and € per capita). Sales data were not available for all EU countries, and they were estimated by predicting the dependent variable based on literature data, media reports or the situation in countries with a similar level of development (as indicated in Table 2).

The analysis was based on Eurostat, Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International and U.S. Department of Agriculture (USDA) data. Some data were obtained from websites dedicated to domestic organic food markets. The data applicable to Malta were excluded from the analyses due to their incidental nature, and the information pertaining to Norway and Switzerland was included due to high organic sales and data completeness. The data for 2016 were subjected to a vertical analysis, whereas the data for 2004-2016 were processed by horizontal analysis. For comparative purposes, the analysed data were standardized based on the Harmonized Index of Consumer Prices (HICP) published by Eurostat. Selected descriptive statistics were used to determine regional variations, including the arithmetic mean, median, minimum, maximum and the coefficient of variation (Vc). Pearson's correlation coefficient was calculated to determine the relationships between the analysed parameters.

Research results and discussion

Organic farming area, including fully converted farms as well as farms under conversion, continues to increase around the world each year. Organic farming area increased from 35 million hectares in 2008 to nearly 58 million hectares in 2016, but it still accounts for only 1.2 % of total agricultural area in the world. Oceania (Australia) has a nearly 50 % share of global organics production, whereas Europe, mostly EU countries, has a nearly 25 % share. Oceania (Australia) also has the highest organic share of the total agricultural land - 6.5 %, followed by Europe - 2.7 %. In contrast, Asia and Africa have the highest number of organic producers in the world, which, combined with a small share of organic areas in their total agricultural land, points to considerable dispersion of small organic farms. Organic retail sales and per capita consumption were highest in North America and Europe (Table 1).

Table 1

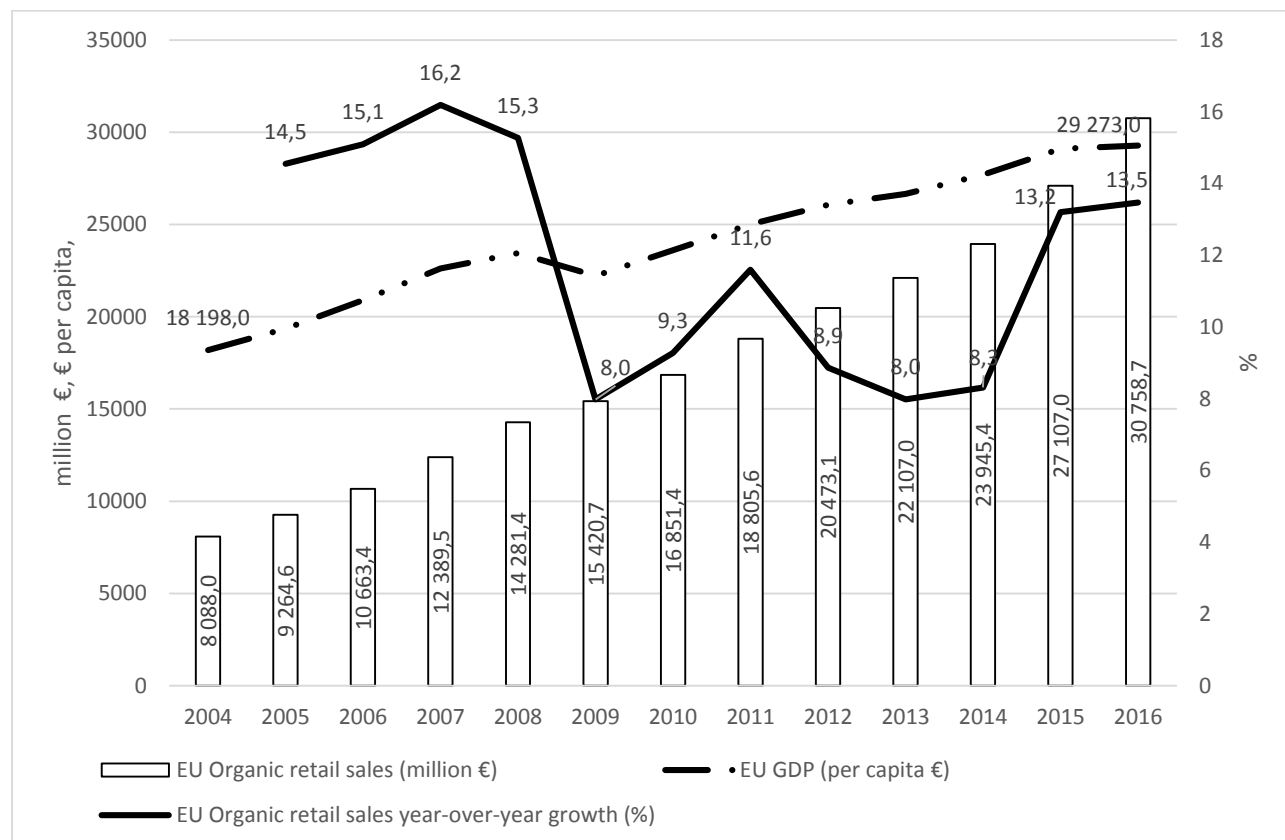
Organic farming and the global organic food market in 2016

Region	Organic agr. land	Share	Numbers of producers	Share of total agri. land	Retail sales	Per capita consumption
	ha	%	no	%	Million €	€
Africa	1801699	3.12	741367	0.2	16	-
Asia	4897837	8.47	1108040	0.3	7343	1.7
Europe	13509146	23.36	373240	2.7	33526	*40.8
Latin America	7135155	12.34	458532	0.9	810	1.3
North America	3130332	5.41	18422	0.8	41939	117.0
Oceania	27346986	47.30	27366	6.5	1065	26.5
World	57821155	100	2726967	1.2	84698	11.3

* UE in 2016 – 60.1 €

Source: author's calculations based on *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348.

Organic retail sales continue to increase in the European Union (and in all of Europe) each year. In 2004, the value of the EU organic market exceeded 8 billion €. The market grew by 14 % in 2005, and this dynamic increase was maintained until 2007 (16.2 % increase to more than 12.3 billion € relative to 2006).



HICP-administered prices (2015 = 100)

Source: author's calculations based on *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348; HICP (2015 = 100) - annual data (average index and rate of change) [prc_hicp_aind] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 10.12.18; Main GDP aggregates per capita [nama_10_pc] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 07.12.18.

Fig. 1. Organic retail sales and their growth rates in the EU in 2004-2016 at constant prices in 2015

Organic retail sales slowed down after 2008, and year-over-year growth reached 15.3 %. In 2009, the market grew at 8 % with sales reaching nearly 15.5 billion €. The above can be linked to the global financial crisis of 2008-2009. Negative changes were also observed on agricultural markets (Borawski P., Beldycka-Borawska A., Dunn J.W., 2018), which weakened the consumers' purchasing power and influenced decision-making on the organic market (Orboi M.D., 2013). The above observations are highly consistent with the drop in GDP per capita (in €) in the EU in the corresponding time period. A new period of dynamic growth on the organic market began in 2009, and sales reached 18.8 billion € in 2011. By 2013, market growth decreased to 8 % relative to 2012. Despite this slowdown, the organic food market continued to increase to 22.1 billion €. Year-over-year growth increased between 2013 and 2015 when the market was valued at 27.1 billion €. In 2016, the growth rate decreased and retail sales topped 30.7 billion € (fig. 1).

Differences in value of the organic food market were evaluated based mainly on an analysis of retail sales. The coefficient of variation for organic retail sales revealed extreme heterogeneity ($V_c = 184.4$ %) among the analysed countries, with an average value of 1 157.3 million € and a median of 150 million €. Organic retail sales are highest in Western Europe, and Germany is the largest market (9 478 million €). In 2016, organic retail sales were also high in France (6 736 million €), Italy (2 644 million €), the United

Kingdom (2 460 million €) and Switzerland (2 298 million €). Relatively high values were also noted in Sweden (1 944 million €), Spain (1 686 million €), Austria (1 542 million €), Denmark (1 298 million €) and Netherlands (1 171 million €). Organic retail sales were lowest in Cyprus (2 million €), Slovakia (4 million €), Lithuania (10 million €), Latvia (10 million €), Bulgaria (27 million €), Hungary (35 million €), Estonia (36.6 million €), Portugal (38.8 million €), Romania (39.5 million €). Detailed data are presented in Table 2.

The observed differences can be attributed mainly to differences in the economic development of the analysed countries. Organic retail sales peaked in highly developed European countries characterized by high incomes and high levels of environmental, economic and health awareness where high price premiums do not drive down sales. It should also be noted that organic production in the „new“ EU Member States is mostly export-oriented (Orboi M.D., 2013). This observation is validated by statistical data which indicate that final consumption expenditure of households (million €) ($r=0.858$; $p<0.001$) and population ($r=0.813$; $p<0.001$) are bound by a strong positive correlation with organic retail sales. It should also be noted a fairly weak relationship indicating that, with the growing general retail sales, sales per capita are growing ($r = 0.372$, $p < 0.05$) (Table 3).

The per capita consumption of organic food is an equally important indicator of the size of organic markets, and it supports a comparison of European regions. Consumption levels are a reflection of the purchasing power and the environmental awareness of consumers who are willing to buy more expensive organic products. Therefore, per capita expenditure can be regarded as a measure of the standard of living. Per capita retail organic sales in the EU were highly varied in the analysed year ($V_c = 123.5\%$), with an average of more than 62 € (in UE 60.1 €) and a median of 32,7 €. Spending on organic food was highest in the Scandinavian and Alpine countries, including Switzerland - 276 €, Denmark - 227.4 €, Sweden - 197.3 €, Luxembourg - 187.4 € and Austria - 177.2 €. In Germany (115.3 €) and France (100.9 €), the average retail sales per capita were less than half the values reported in Switzerland. The lowest retail sales per capita were noted in Slovakia - 0.7 €, Romania - 2 €, Lithuania - 3.5 €, Hungary - 3.6 €, Bulgaria - 3.8 € and Portugal - 3.8 € (Table 2). These findings emphasize the dominant role of affluent countries where high price premiums do not decrease the demand for organic food.

Table 2

Variables characterizing the organic food market in the EU in 2016

Specification	A	B	C	D	E	F	G	H	I
	ha	% of UAA	Million €	€ per capita	persons	Million €	€ per capita	Million €	€ per capita
EU	11931885	6.7	30758.7	60.1	510277177		29200	8098087.1	15870.0
Austria	571423	21.3	1542	177.2	8700471		40800	178675.5	20536.3
Belgium	78452	5.8	586	51.8	11311117		37600	212141.5	18755.1
Bulgaria	160620	3.2	**27	3.8	7153784		6800	28998.2	4053.6
Croatia	93593	6.1	*137.1	32.7	4190669		11200	26072.7	6221.6
Cyprus	5550	4.9	**2	5.0	848 319		21700	12507.4	14743.8
Czechia	488591	14.0	*80.2	7.6	10553843	59	16700	81862.7	7756.7
Denmark	204950	7.8	1298	227.4	5707251	329	49200	128014	22430.1
Estonia	180852	18.0	***36.6	27.8	1315944		16500	10777.3	8189.8
Finland	238240	10.5	273	49.8	5487308		39300	113372	20660.8
France	1537351	5.3	6736	100.9	66730453	629	33300	1164859	17456.2
Germany	1135941	6.8	9478	115.3	82175684		38400	1622135	19739.8
Greece	342584	6.5	**95	8.8	10783748		16400	117180.6	10866.4
Hungary	186322	3.5	**35	3.6	9830485		11600	54691.4	5563.5
Ireland	76701	1.7	150	31.7	4726286		57500	89465.4	18929.3
Italy	1796333	14.0	2644	43.6	60665551	1915	27900	1012573.2	16691.1
Latvia	259146	13.4	**10	5.1	1968957		12800	14751.1	7491.8
Lithuania	221665	7.5	10	3.5	2888558		13500	24782.6	8579.6
Luxembourg	4528	3.5	108	187.4	576249		91300	15400.1	26724.7
Netherlands	52204	2.9	1171	69.0	16979120	1200	41600	310430	18283.0
Norway	47621	4.9	394	75.6	5210721		64100	143778.1	27592.8
Poland	536579	3.7	**219.7	5.8	37967209		11100	246103.8	6482.0
Portugal	245052	6.8	***38.85	3.8	10341330		18100	118037	11414.1
Romania	226309	1.7	**39.55	2.0	19760314		8600	105083.9	5317.9
Slovakia	187024	9.8	4	0.7	5426252		15000	43579.1	8031.2
Slovenia	43579	9.1	*58.68	28.4	2064188		19500	21187	10264.1
Spain	2018802	8.5	1686	36.3	46440099	891	24100	631793	13604.5
Sweden	552695	18.3	1944	197.3	9851017	84	46700	200784	20382.1
Switzerland	141249	13.5	2298	276.0	8327126		72400	313597.3	37659.7
UK	490205	2.8	2460	37.6	65382556		36600	1507354.7	23054.4
arithmetic mean	418074.5	8.1	1157.3	62.61	18047055.5	729.6	31044.8	294827.2	15085.4
median	221665	6.8	150	32.72	8700471	629.0	24100.0	117180.6	14743.8
minimum value	4528	1.7	2	0.7	576249	59.0	6800.0	10777.3	4053.6
maximum value	2018802	21.3	9478	276.0	82175684	1915.0	91300.0	1622135.0	37659.7
standard deviation	531369.3	5.3	2133.4	77.3	23163736.9	669.5	21004.6	449129.4	8116.0
coefficient of variation	127.1	64.9	184.4	123.5	128.4	91.8	67.7	152.3	53.8

Estimates based on: * predictions of the dependent variable; ** literature data or media reports; *** analogy (%) with countries with similar levels of development.

A – Total fully converted and under conversion to organic farming; B – Area under organic farming (% of utilised agricultural area (UAA)); C – Retail sales, D – Per capita consumption; E – Population; F – Exports; G – Main GDP aggregates per capita; H, I – Final consumption expenditure of households

Source: author's calculations based on The World of Organic Agriculture. Statistics and Emerging Trends 2018. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348 (ABCDF); Population on 1 January by age and sex [demo_pjan] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18 (E); Main GDP aggregates per capita [nama_10_pc] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 07.12.18 (G); GDP and main components (output,

expenditure and income) [nama_10_gdp] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18 (HI).

The discussed phenomenon is validated by the results of the correlation analysis which revealed a strong correlation between the size of the organic food market and the levels of economic development in the analysed countries. Organic retail sales per capita increased with a rise in GDP per capita (€ per capita; $r=0.773$; $p<0.001$). Per capita consumption of organic products also increased with a rise in Final consumption expenditure of households (€ per capita) ($r=0.797$; $p<0.001$) (Table 3).

Table 3

Descriptive statistics and matrix of coefficients of correlation between variables (N=29)

	Mean	SD	A	B	C	D	E	F	G	H	I
A	418074.5	531369.3	1								
B	8.1	5.3	.200	1							
C	1157.3	2133.4	*.613	.041	1						
D	62.6	77.3	.038	.341	***.372	1					
E	18047055.5	23163736.9	*.785	-.143	*.813	.016	1				
F	729.6	669.5	.479	-.252	.169	-.426	.619	1			
G	31044.8	21004.6	-.095	.011	.216	*.773	-.029	-.161	1		
H	294827.2	449129.4	*.681	-.091	*.858	.145	*.956	** .943	.126	1	
I	15085.4	8116.0	.024	.112	.350	*.797	.124	.077	*.916	.307	1

correlation coefficient significant at *0.001, **0.01 and ***0.05

where: A – Total fully converted and under conversion to organic farming (ha); B – Area under organic farming (% of utilised agricultural area (UAA)); C – Retail sales (Million €); D – Retail sales (€ per capita); E – Population; F – Export (Million €, N=7); G – Main GDP aggregates per capita (€ per capita); H – Final consumption expenditure of households (Million €); I – Final consumption expenditure of households (€ per capita)

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

Conclusions, proposals, recommendations

The organic food market continues to grow on all continents, but the highest growth rates are observed in Europe. The above is driven by higher demand for organic food, which can be attributed to growing levels of environmental and health awareness as well as an increase in the purchasing power of European consumers. At the same time, organic farming subsidies increase production levels and, consequently, augment the supply of organic products. Price premiums stifle demand and pose the greatest obstacle to the development of the organic food market. The differences in the prices of organically and conventionally produced foods are likely to diminish with an increase in the supply of organic food products, which will drive the demand for such products.

The results of this analysis point to considerable differences in the retail sales and per capita consumption of organic food in the EU. The observed variations can be attributed mainly to heterogeneity in economic development expressed by GDP and consumer expenditure in the evaluated countries. The analysis also revealed an interesting relationship. In absolute terms, organic retail sales are determined mainly by population and GDP per capita, which indicates that organic sales are highest in the countries with a high number of relatively wealthy inhabitants. In turn, organic consumption per capita is strongly affected by GDP and consumption expenditure. Therefore, countries with a higher GDP per capita and higher final consumption expenditure of household are characterized by higher retail organic sales. The analysis revealed that the sales and consumption of organic food are highest in Germany, France, Italy, the UK and Switzerland, whereas per capita consumption is highest in Switzerland, Denmark, Sweden, Luxembourg and Austria. The newest EU Member States (Slovakia, Lithuania, Latvia, Bulgaria, Hungary and Estonia) are characterized by lower sales and consumption of organic products as well as the smallest organic food markets, with Cyprus being the leader in this group of countries.

Bibliography

1. Basha, M.B., Mason, C., Shamsudin, M.F., Hussain, H.I., Salem, M.A. (2015). Consumers Attitude towards Organic Food. *Procedia Economics and Finance*, Vol. 31, pp. 444-452, [https://doi.org/10.1016/S2212-5671\(15\)01219-8](https://doi.org/10.1016/S2212-5671(15)01219-8)
2. Borawski, P., Beldycka-Borawska, A., Dunn, J.W. (2018). Price Volatility of Polish Agricultural Commodities in the View of the Common Agricultural Policy. *Agric. Econ. – Czech*, Vol. 64 Issue 5, pp. 216-226. <https://doi.org/10.17221/138/2016-AGRICECON>
3. Brodziska, K. (2015). Problems of Biodiversity Conservation in Polish Agriculture. *Agroecology & Sustainable Food Systems*. Vol. 39, No. 2, pp. 155-169. doi:10.1080/21683565.2014.934941.
4. *Council Regulation (EC) No 834/2007 of 28 June 2007 on Organic Production and Labelling of Organic Products and Repealing Regulation (EEC) No 2092/91.*
5. *GDP and Main Components (output, expenditure and income)* [nama_10_gdp] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18.
6. Greenan, K., Humphreys, P., McIvor, R. (1997). The Green Initiative: Improving Quality and Competitiveness. *European Business Review*, Vol. 97 No. 5, pp. 208-14.
7. *HICP (2015 = 100) - annual data (average index and rate of change)* [prc_hicp_aind]. Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 10.12.18.
8. Krystallis, A., Chrysosoidis, G. (2005). Consumers' Willingness to Pay for Organic Food: Factors That Affect It and Variation Per Organic Product Type. *British Food Journal*, Vol. 107 Issue: 5, pp. 320-343, <https://doi.org/10.1108/00070700510596901>
9. *Main GDP Aggregates Per Capita* [nama_10_pc] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 07.12.18;
10. Orboi, M. D. (2013). Aspects Regarding the Evolution the Organic Food Market in the World. *Research Journal of Agricultural Science*, Vol. 45, No. 2, pp. 201-209.
11. Pawlewicz, A. (2014). Importance of Horizontal Integration in Organic Farming. *Economic Science for Rural Development: Production and Co-operation in Agriculture*. Issue 34, pp. 112-120.
12. *Population on 1 January by Age and Sex* [demo_pjan] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18.
13. Shafie, F. A., Rennie, D. (2012). Consumer Perceptions Towards Organic Food. *Procedia-Social and Behavioral Sciences*, Vol. 49, pp. 360-367, <https://doi.org/10.1016/j.sbspro.2012.07.034>
14. *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, s. 348
15. Wier, M., Calverley, C. (2002). Market Potential for Organic Foods in Europe. *British Food Journal*, Vol. 104 Issue: 1, pp. 45-62, <https://doi.org/10.1108/00070700210418749>

THE QUALITY OF THE ENVIRONMENT IN EU COUNTRIES IN RELATION TO GROSS DOMESTIC PRODUCT – STATIC AND DYNAMIC TAXONOMIC ANALYSES

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Abstract. It is a commonly accepted thesis that the quality of the environment increases together with the level of society's prosperity expressed by gross domestic product (GDP). The relationship displayed by the environmental Kuznets curve partially confirms the above statement. In view of today's strong interest in environmental protection problems, the relationship defined by the environmental Kuznets curve is worth verifying.

The purpose of the research is to design a synthetic measure of the quality of the environment and specify the relation of this measure to gross domestic product, and furthermore to identify the impact of variables representing the quality of the environment on the value of the quality of the environment measure. The analysis covered data from 25 European Union countries in the years 2004-2016. The synthetic measure of the quality of the environment was designed using the TOPSIS-CRITIC method.

The result of the analyses is ascertainment of modification of the Kuznets curve, understood as the relationship between GDP and the quality of the environment. It was found that the Kuznets curve assumed a U-like shape in both classes of the analysed countries (growth and decrease of the geometric mean of the synthetic measure of the quality of the environment).

Key words: Kuznets curve, GDP, TOPSIS-CRITIC.

JEL code: A10, E01, O13, Q51.

Introduction

The quality of the environment is a very important element of sustainable development, next to economic, social and environmental factors (Soliwoda, 2015). A lot of factors shaping the quality of the environment are difficult to express in quantitative terms. Furthermore, the multitude of variables determining the quality of the environment makes it difficult to assess its real value. Therefore, an attempt to create a synthetic measure defining the quality of the environment was made. Application of a synthetic measure facilitates comparing units, especially if they are in large numbers, and allows for grouping units characterised by similar determinants (Majchrzak, Wysocki, 2007).

In literature there is a common view that environmental degradation increases along with GDP growth until the latter reaches a certain value after which the condition of the environment improves. This correlation is known as the Kuznets curve (Dinda, 2004). The environmental variation of the Kuznets curve was developed by Grossman and Krueger (Grossman, Krueger, 1991).

The environmental Kuznets curve shows the relationship between gross domestic product and the level of pollution of the environment, however, this concept does not take into consideration social impact, promotion of pro-environmental activities and the volume of funding of environmental protection activities by government agencies. Thus, it should be assumed that the above-mentioned factors may modify the shape of the environmental Kuznets curve.

The purpose of this paper is to propose a method for designing a synthetic measure of the quality of the environment and to verify the law governing the Kuznets curve by testing the relationship between the proposed measure and gross domestic product.

Achievement of the said purpose should produce new insight about the measurement of the quality of the environment and verify the relationship between the values defined by the Kuznets curve. Additionally, achievement of this purpose should provide mechanisms for monitoring maintenance of the natural environment in proportion to economic growth.

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A major disadvantage of the synthetic measure of the quality of the environment is concentration of the environmental policy on selected components of the measure, what causes divergence in the objectives of the environmental policy. For instance, the said measure may go down as a result of deterioration of air quality, while there may be the opposite effect as soil quality might have improved at the same time.

Research methodology

First, the variables defining the quality of the environment were selected. The values of the variables were obtained from the Eurostat database. The analysis covered data from 25 European Union member states in the years 2004-2016. Some countries were excluded from the analyses (Romania, Croatia, Bulgaria) due to incomplete data in the Eurostat database.

Then, a synthetic measure of the quality of the environment was developed by means of the TOPSIS method (*Technique for Order Preference by Similarity to an Ideal Solution*) (Wysocki, 2010). By analysing the literature, 9 variables were selected for formation of the synthetic measure: estimated soil erosion by water, consumption of inorganic fertilizers – nutrient: phosphorus, consumption of inorganic fertilizers – nutrient: nitrogen, ammonia emissions from agriculture, greenhouse gas emissions: agriculture, air pollution (non-methane volatile organic compounds), air pollutants (particulates <2.5 µm), air pollutants (particulates <10 µm), population of endangered birds species and habitats.

The values included in the analysis were converted to a hectare of an area to ensure comparability of the analysed variables.

From among the set of variables acceptable for the formation of the synthetic measure of the quality of the environment, those variables which were characterised by sufficient level of the coefficient of variance and were not excessively correlated with other coefficients were selected. Correlation was assessed by means of a correlation matrix between the variables and then an invertible matrix. Next step was the analysis of the diagonal elements of the invertible matrix. It was established that values exceeding 10 determine improper condition number of the matrix and thus excessive correlation of a particular feature with the other features (Czyzewski, Kryszak, 2017). Therefore, from 6 to 8 variables were qualified for the formation of the synthetic measure of the quality of the environment, depending on the year covered by the analysis (Table 1).

At the next stage, the variables qualified for the synthetic measure of the quality of the environment were subjected to zero unitarization, and destimulants were converted into stimulants (all the variables save for the population of endangered bird species and habitats variable, which was classified as a stimulant). The unitarization was performed according to the following formulae:

$$- \text{stimulants: } z_{ij} = (x_{ij} - [\min]_i \{x_{ij}\}) / [\max]_i \{[\{x_{ij}\} - [\min]_i \{x_{ij}\}]\}, (i = 1, 2, \dots, n; j = 1, 2, \dots, m); z \in [0, 1] \quad (1)$$

$$- \text{destimulants: } z_{ij} = ([\max]_i \{x_{ij}\} - x_{ij}) / [\max]_i \{[\{x_{ij}\} - [\min]_i \{x_{ij}\}]\}, (i = 1, 2, \dots, n; j = 1, 2, \dots, m); z \in [0, 1] \quad (2)$$

where: $\min_i \{x_{ij}\}$ – minimum value of j feature, $\max_i \{x_{ik}\}$ – maximum value of j feature, i – object (in this case country).

Then, weights for particular coefficients were determined by means of the CRITIC method (*Criteria Importance Through Intercriteria Correlation*) (Diakoulaki et al., 1995; Deng et al., 2000). Similarly to the works of (Bieniasz et al., 2013; Czyzewski, Kryszak, 2017), an assumption that the influence of particular simple features on the value of synthetic measure of the quality of the environment is not identical was made. In the CRITIC method, weight coefficients are determined on the basis of standard deviations and correlation between the coefficients. A distinctive feature of this method is assigning relatively higher weights to features which are characterised by a high rate of variability and simultaneously low correlation with other features. The weight coefficients were determined according to the following formulae:

$$w_j = \frac{c_j}{\sum_{k=1}^m c_k}, j = 1, 2, \dots, m; c_j = s_{j(z)} \sum_{k=1}^m [(1 - r_{ij})], j = 1, 2, \dots, m \quad (3)$$

where: c_j – measure of informational capacity of j feature, $s_{j(z)}$ – standard deviation calculated out of the standardised values of j feature, r_{ij} – correlation coefficient between j and k features. The sum of the coefficients is 1. Next step was multiplication of the determined standardised values of simple features by relevant weight coefficients.

At the next stage, calculation of Euclidean distances of particular units from the pattern and anti-pattern of development was performed. The calculation of Euclidean distances was performed according to the following formulae:

$$d_i^+ = \sqrt{\left(\sum_{j=1}^k [(z_{ij}^*)] - z_{ij}^+ \right)^2} - \text{distance from the pattern of development} \quad (4)$$

$$d_i^- = \sqrt{\left(\sum_{j=1}^k [(z_{ij}^*)] - z_{ij}^- \right)^2} - \text{distance from the anti - pattern of development} \quad (5)$$

where:

$$z_j^+ = (\max(z_{i1}^*), \max(z_{i2}^*), \dots, \max(z_{ik}^*)) = (z_1^+, z_2^+, \dots, z_k^+)$$

$$z_j^- = (\min(z_{i1}^*), \min(z_{i2}^*), \dots, \min(z_{ik}^*)) = (z_1^-, z_2^-, \dots, z_k^-)$$

At the next stage, the value of q_i synthetic feature was determined according to the following formula:

$$q_i = \frac{d_i^-}{d_i^+ + d_i^-}, (i = 1, 2, \dots, n) \quad (6)$$

At the end-stage of the analyses, the countries were divided into two classes, taking growth (class A) or decrease (class B) of the geometrical mean of the synthetic measure of the quality of the environment as the criterion.

Research results and discussion

The application of the CRITIC method enabled to determine the weights of the variables used for the designation of the synthetic measure, the weights assigned to the variables forming the synthetic measure are shown in Table 1. The estimated soil erosion by water variable (approximately 20 %) followed by the nutrition – nitrogen variable (approximately 19 %) had the biggest average share in the synthetic measure. Furthermore, it should be noted that three from among the analysed variables formed part of the synthetic measure only in certain years, these are the ammonia emissions from agriculture, air pollution (non-methane volatile organic compounds) and air pollutants (particulates < 2.5 μm) variables. The air pollutants (particulates < 10 μm) variable did not meet the criteria which would allow for its inclusion in the measure of the quality of the environment in any of the analysed years.

Table 1

Weights of the variables used in the formation of the synthetic measure of the quality of the environment *

No.	Year	Estimated soil erosion by water	Nutrient: Phosphorus	Nutrient: Nitrogen	Ammonia emissions from agriculture	Greenhouse gas emissions - agriculture	Air pollution (non-methane volatile organic compounds)	Air pollutants (Particulates < 2.5 µm)	Air pollutants (Particulates < 10 µm)	Common farmland bird index 2000 = 100
1.	2004	0.2173	0.1891	0.1784	-	0.1443	0.1285	-	-	0.1424
2.	2005	0.2168	0.1679	0.1811	-	0.1434	0.1227	-	-	0.1682
3.	2006	0.2200	0.1780	0.1699	-	0.1437	0.1253	-	-	0.1631
4.	2007	0.2222	0.1763	0.1693	-	0.1451	0.1292	-	-	0.1579
5.	2008	0.2026	0.1732	0.2074	-	0.1479	-	0.1200	-	0.1489
6.	2009	0.2093	0.1286	0.1654	0.0717	0.1075	-	0.1629	-	0.1545
7.	2010	0.1968	0.1496	0.2048	0.0972	0.1150	-	0.1027	-	0.1337
8.	2011	0.1979	0.1659	0.2227	-	0.1514	-	0.1182	-	0.1439
9.	2012	0.2018	0.1618	0.2123	-	0.1571	0.1226	-	-	0.1443
10.	2013	0.1877	0.1698	0.1771	0.0974	0.1303	-	0.1004	-	0.1374
11.	2014	0.2021	0.1673	0.2055	-	0.1590	-	0.1273	-	0.1388
12.	2015	0.1931	0.1612	0.1628	0.1206	0.1220	-	0.1082	-	0.1320
13.	2016	0.1745	0.1543	0.1493	0.1107	0.1072	0.0894	0.0915	-	0.1231
Mean		0.2008	0.1624	0.1860	0.0995	0.1352	0.1169	0.1164	-	0.1436

* 1-1 variables rejected due to excessive correlation

Source: authors' calculations

The analyses carried out by Jankowska on a sample of 29 countries demonstrated that the environmental Kuznets curve assumed an N-like shape. The research covered the years 2000-2001 (Jankowska, 2016). The analyses conducted in this paper were based on the classification of the analysed EU countries (25) into two groups, one group consisted of countries showing average geometric growth of the synthetic measure of the quality of the environment (Figure 1). In the said group of countries, the Kuznets curve partially assumes a U-like shape ($R^2=0.2638$), what is inconsistent with the model presentation of the Kuznets curve, as it assumes the shape of an inverted parabola in the models. In addition, it should be noted that the said curve is to a certain extent similar to the curve showing the relationship between the levels of air particulate pollutants and GDP (Grossman, Krueger, 1991).

The same curve shape as in the model defined as the Kuznets curve was obtained in the analysis of the relationship between economic growth, energy consumption and environmental protection quality in 11 countries in the years 1997-2013 (Destek, Sarkodie, 2019). Similar relations, characteristic of the model Kuznets curve, were obtained in other research focusing on the relationship between GDP level and carbon dioxide emission (Dong et al., 2019).

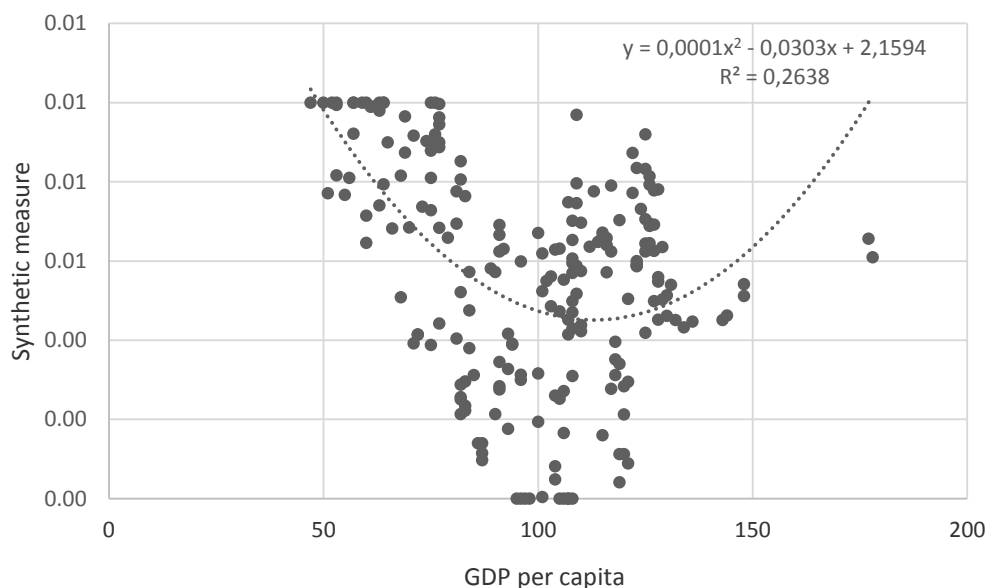


Fig. 1. Relationship between GDP per capita and the synthetic measure of the quality of the environment (countries showing growth of the geometric mean of the synthetic measure of the environment)

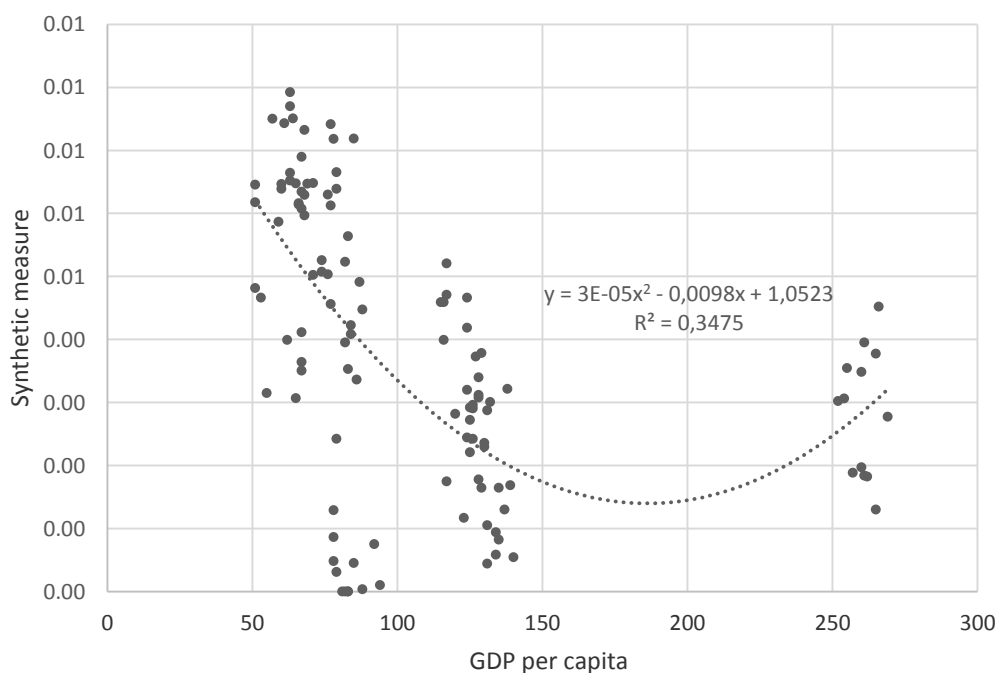


Fig. 2. Relationship between GDP per capita and the synthetic measure of the quality of the environment (countries showing decrease of the geometric mean of the synthetic measure of the environment)

The analyses carried out among the countries showing the decrease of the geometric mean of the synthetic measure of the quality of the environment produced a Kuznets curve with its shape remarkably similar to letter U ($R^2 = 0.3475$). This result differs from the findings of Jankowska's analyses, where the curve assumed an N-like shape (Jankowska, 2016).

In the analysed collective, 16 countries displayed an upward tendency and 9 countries showed a downward tendency displayed by the measure of the quality of the environment (Figure 3). It is therefore interesting to explain which variables and to what extent had impact on these tendencies in the pattern of the said measure.

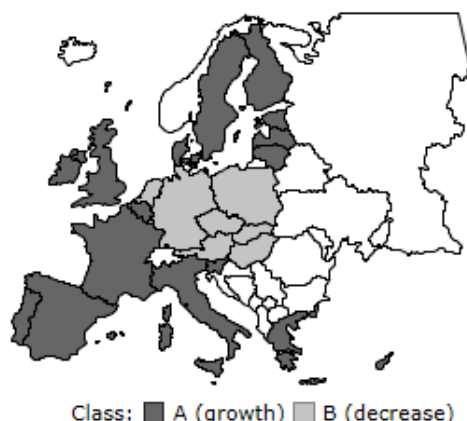


Fig. 3. **Classification of the countries according to the direction (A – growth, B – decrease) of the average annual changes in the quality of the environment in the period 2004-2016**

A very interesting relationship can be observed in terms of the location of the analysed countries by groups, i.e. class A – countries showing growth, class B – countries showing decrease of the geometric mean of the measurement of the quality of the environment (Figure 3). It should be noted that 8 out of 9 countries showing decrease of the geometric mean of the measure of the quality of the environment border each other, creating a distinctive territorial block. This location of the countries may suggest a similar level of intensification of agriculture, as the variables used in the formation of the synthetic measure of the quality of the environment are largely connected with agriculture. Another cause may be outsourcing of toxic production to class B countries, including branches of agriculture which produce negative effects on the environment (Kim, 2019).

The analysis of the dynamics of the changes in the measure of the quality of the environment expressed by geometrical mean in the entire analysed period, i.e. in the years 2004-2016, indicated constant trends. However, it should be remarked that despite the fact that these trends were constant, they developed differently among the countries showing growth of the geometric mean (Figure 4) from among the countries showing decrease of the said value (Figure 5).

The analysis of the values forming the synthetic measure of the quality of the environment for the two groups of countries shows considerable differences in particular in terms of nitrogen fertilization, ammonia emissions from agriculture, greenhouse gas emissions from agriculture, and air pollutants (Table 2).

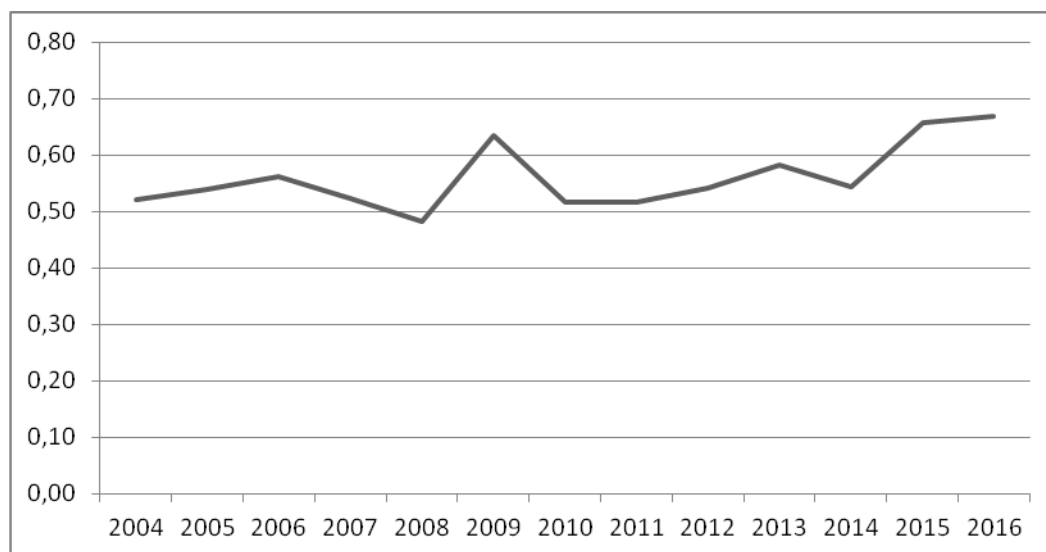


Fig. 4. **Dynamics of the synthetic measure of environmental quality for the average value in countries with the geometric mean value of the analysed measure <1, in 2004-2016**

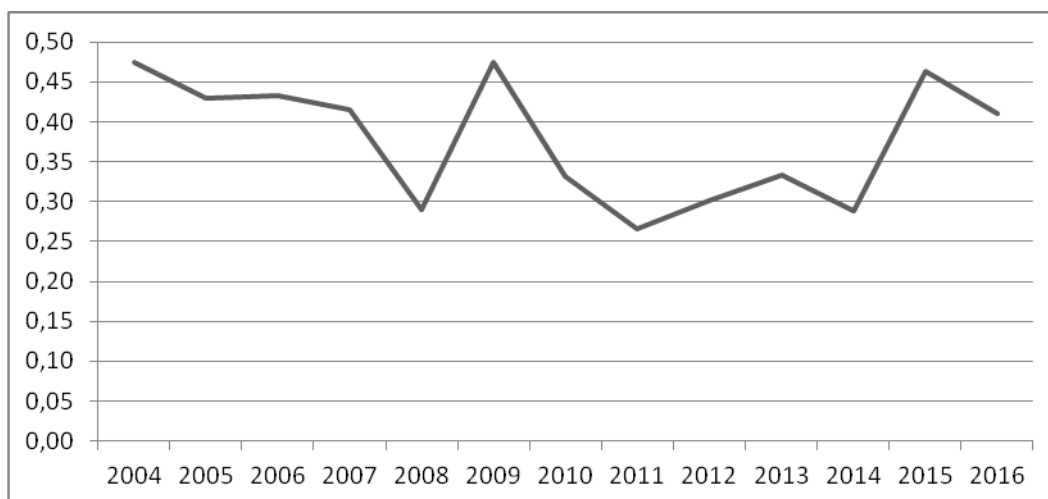


Fig. 5. Dynamics of the synthetic measure of environmental quality for the average value in countries with the geometric mean value of the analysed measure ≥ 1 , in the years 2004-2016

Table 2

Mean values of the variables forming the synthetic measure of the quality of the environment (years 2004-2016)

Class**	Variable*				
	x1	x2	x3	x4	x5
A	2.341	6.353	54.439	20.004	2942.116
B	2.566	5.846	78.918	40.955	4058.424
Mean	2.422	6.170	63.251	27.546	3343.987
	x6	x7	x8	x9	
A	22.005	4.433	3.920	85.349	
B	65.513	10.514	22.267	84.615	
Mean	37.667	6.622	14.205	85.085	

* x_1 -estimated soil erosion by water, x_2 -nutrient: phosphorus, x_3 -nutrient: nitrogen, x_4 -ammonia emissions from agriculture, x_5 -greenhouse gas emissions – agriculture, x_6 -air pollution (non-methane volatile organic compounds), x_7 -air pollutants (Particulates < 2.5 μm), x_8 -air pollutants (Particulates < 10 μm), x_9 -common farmland bird index 2000 = 100,

** class A – countries with the geometric mean of the synthetic measure of the quality of the environment ≥ 1 , class B – countries with the geometric mean of the synthetic measure of the quality of the environment < 1

Conclusions

1) Two dissimilar patterns of the Kuznets curve from the most common ones found in literature. The Kuznets curve assumed a U-like shape in both classes of the analysed countries.

It should be noted that the subject of the analysis was the relationship between gross domestic product and the synthetic measure of the quality of the environment, which is a completely different value from the values commonly used in the Kuznets curve. In the traditional environmental Kuznets curve, one value is always gross domestic product, but the other value frequently varies (Sarkodie, Strezov, 2019).

2) The present analyses refer to the area of the analysed territories. Further analyses should also focus on the population which plays a very important role in creating consumption adversely affecting the quality of the environment. Another major problem is analysing the values in relation to the structure of foreign trade to test exchange transactions between countries in terms of negative impact on the quality of the environment.

Acknowledgements

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Bibliography

1. Bieniasz, A., Golas, Z., Łuczak, A. (2013). Zróżnicowanie kondycji finansowej gospodarstw rolnych wyspecjalizowanych w chowie owiec i koz w krajach Unii Europejskiej (Diversity of the Financial Condition of Farms Specialising in Sheep and Goat Husbandry in the European Union countries). *Roczniki Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*, 100 (1), 168-181.
2. Czyżewski, B., Kryszak, L. (2017). Kondycja finansowa gospodarstw rolnych w regionach FADN Unii Europejskiej i jej związek z produktywnością czynników wytwórczych (Financial Condition of Agricultural Holdings in EU FADN Regions and its Relation to Factor Productivity). *Roczniki Naukowe Ekonomii Rolnictwa i Rozwoju Obszarów Wiejskich*, 104 (3), 7-20.
3. Deng, H., Yeh, C. H., Willis, R. J. (2000). Inter-company Comparison Using Modified TOPSIS with Objective Weights. *Computers & Operations Research*, 27, 963-973.
4. Destek, M. A., Sarkodie, S. A. (2019). Investigation of Environmental Kuznets Curve for Ecological Footprint: The Role of Energy and Financial Development. *Science of the Total Environment*, 650, 2483-2489.
5. Diakoulaki, D., Mavrotas, G., Papayannakis, L. (1995). Determining Objective Weights in Multiple Criteria Problems - the Critic Method. *Computers & Operations Research*, 22, 763-770.
6. Dinda, S. (2004). Environmental Kuznets Curve hypothesis: A survey. *Ecological Economics*, 49, 431-455.
7. Dong, F., Wang, Y., Su, B., Hua, Y. F., Zhang, Y. Q. (2019). The process of peak CO₂ emissions in developed economies: A perspective of industrialization and urbanization. *Resources Conservation and Recycling*, 141, 61-75.
8. Grossman, G. M., Krueger, A. B. (1991). Environmental Impacts of a North American Free Trade Agreement. *NBER Working Paper No. 3914*.
9. Jankowska, E. (2016). Środowiskowa krzywa Kuzneta w dekarbonizacji europejskich gospodarek (Environmental Kuznets Curve in Decarbonisation of the European Economies). *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 289, 51-61.
10. Kim, S. (2019). CO₂ Emissions, Foreign Direct Investments, Energy Consumption, and GDP in Developing Countries: A More Comprehensive Study using Panel Vector Error Correction Model. *Korean Economic Review*, 35, 5-24.
11. Majchrzak, A., Wysocki, F. (2007). Potencjał produkcyjny rolnictwa w województwie wielkopolskim (Productive Potential of Agriculture in Greater Poland Province). *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu*, 9 (2), 217-221.
12. Sarkodie, S. A., Strezov, V. (2019). A Review on Environmental Kuznets Curve Hypothesis Using Bibliometric and Meta-Analysis. *Science of the Total Environment*, 649, 128-145.
13. Soliwoda, M. (2015). Dylematy wokół wymiaru finansowego zrównowazenia gospodarstw rolniczych (Dilemmas in a Financial Dimension of Sustainability of Farms). *Zagadnienia Ekonomiki Rolnej*, 344 (3).
14. Wysocki, F. (2010). *Metody taksonomiczne w rozpoznawaniu typów ekonomicznych rolnictwa i obszarów wiejskich (Taxonomic Methods in Recognising Economic Types of Agriculture and Rural Areas)*, Poznań, Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu.

THE PRODUCTION OF SHEEP'S MILK IN EU COUNTRIES

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Abstract. The main objective of the studies was to discuss situation in sheep milk market in the European Union. Specific objectives include presentation of the data related to dairy sheep's population and commercial production of sheep's milk in separate EU countries, as well as indication of the main interdependent factors with milk production. Studies have been performed on a group that included all the countries which belonged to the EU as of 31.12.2013 and commercial produce a sheep's milk. There were 14 such countries. Data assumed for studies concerned years 2008-2017. The sources of materials were analysis of literature, EUROSTAT Database. For the purposes of the analysis of the materials, the authors used dynamic indicators on variable base, Gini coefficient, concentration analysis using the Lorenzo curve, and the Pearson linear correlation coefficient. For materials' presentation the authors used descriptive, tabular and graphical methods. Studies carried out allowed to show changes in sheep's milk production. In 2008-2017, the production of sheep's milk intended for processing in dairies increased, which could have been a result from the less internal consumption of farms. The level of concentration of sheep milk production in the EU was very high, but there were no changes in this regard. Commercial production of sheep's milk was concentrated in several countries, like Greece, Spain, Italy and France. Commercial production of sheep's milk was more correlated with sheep population and lamb meat production, than population of dairy sheep and economy parameters.

Key words: EU countries, sheep production, sheep milk, dairy sheep population.

JEL code: F15, O11, Q10.

Introduction

Throughout the centuries, milk was a desirable and valuable food source wherever livestock animals were bred (Barłowska et al., 2011). Sheep milk contains higher levels of total solids and major nutrient than cow and goat milk. Lipids in sheep milk have higher physical characteristics than in cow milk. Mineral and vitamin contents of sheep milk are mostly higher than in cow milk. The highest energy value is characteristic of sheep milk, too (Park et al., 2007). Sheep milk is the richest in whey proteins and also contains the highest concentration of casein (Dario et al., 2008). Milk is an important source of mineral substances, especially calcium, sodium, phosphorus, potassium, chloride, magnesium, iodine, and small amounts of iron. The highest concentration of this mineral elements is in sheep milk (Al-Wabel, 2008).

For the production and promotion of sheep milk and derivative dairy products very important are information on fatty acid (FA) profile. The presence of the essential ω -3 and ω -6 FA in milk fat as well as other less common FA, like linoleic acid isomers, has gained an increasing interest due to the consumer demand for a healthy diet (Sinanoglou et al., 2015). Characteristic of sheep milk is a higher concentration of conjugated linoleic acid (CLA) than cow and goat milk (Talpur et al., 2008). The aforementioned CLA has numerous functional properties. It is claimed to inhibit the occurrence and development of cancer of the skin, breast, colon, and stomach (Parodi, 1999), prevent obesity (Bawa, 2003; Wang and Jones, 2004). Additionally, CLA reduces the levels of triglycerides, total cholesterol, including LDL, and thus improves the ratio of LDL/HDL in plasma, therefore, it prevents coronary heart disease and atherosclerosis (Gaviño et al., 2000; Tricon et al., 2004). CLA also is said to inhibit the development of osteoporosis (Watkins and Seifert, 2000), to improve the metabolism of lipids, to reduce the blood glucose level, and to stimulate the immune system (O'Shea et al., 2004). For the above reasons, sheep's milk is a very valuable food source. Sheep milk, regarding their high content of protein, including casein, and fat, make a very good raw material for processing, especially cheese-making (de la Fuente et al., 2013).

Global milk production is dominated by five animal species: dairy cattle, buffalo, goats, sheep and camels. The annual production of sheep's milk in the world is about 10.5 million tons and constitutes 1.3 % of the total milk production obtained from various mammalian species (Faostat, 2017). The most of

production is used to manufacture cheeses and fermented beverages. Products from sheep milk are commonly considered as regional articles. They are protected by legal regulations which guarantee their taste and aroma typical for a given region and which they owe to traditional production technologies (Dankow and Pikul, 2011). The world's major producer of sheep milk was China (about 12 %). However, most sheep's milk is produced in EU countries. Milk is the EU number one single product sector in terms of value at approximately 15 % of agricultural output. In 2016, the farms in the EU-28 produced approximately 168.3 million tons of milk. Production of cows' milk was 163.0 million tons (97 % of all milks produced). Milk from ewes, goats and buffalos represented 5.4 million tons (3.1 %). The main part of milk produced was delivered to the dairies and the remaining amount (11.2 million tons) was used otherwise on the farms, i.e. own-consumed, processed, used as feed, or sold directly to consumers. The production of sheep's milk accounted for around 2.8 million tons, and 1.9 million tons went to the dairy. The leaders in Europe include Greece, Turkey, Romania and Italy. Almost all of the sheep milk produced is used for cheese-making, whether on the farm or in industrial dairies. Spain, Italy and France produced 93 % of total EU production of cheese from ewe's pure milk (The sheep..., 2017; Milk..., 2017; Rokicki, 2017; Rokicki and Ratajczak, 2018).

Materials and methods

The purpose of the article was to discuss situation in sheep milk market in the European Union. In addition, the paper also presents specific objectives. Such objectives include: presentation of the data related dairy sheep's population and commercial production of sheep's milk in separate EU countries; as well as indication of the main interdependent factors with milk production. Studies have been performed on group included all the countries which belonged to the EU as of 31.12.2013 and commercial produce a sheep's milk. There were 14 such countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, France, Greece, Hungary, Italy, Poland, Portugal, Romania, Slovakia, Spain. Data assumed for studies concerned years 2008-2017. The sources of materials were analysis of literature, EUROSTAT Database. The paper uses the following methods: descriptive, tabular, graphical, dynamic indicators on variable base, Gini coefficient, concentration analysis using the Lorenzo curve, and the Pearson linear correlation coefficient.

Two hypotheses were stated in the work.

- 1) In 2008-2017, the level of concentration of sheep milk production in the EU increased.
- 2) Commercial production of sheep's milk was more correlated with the population of dairy sheep than with other parameters related to sheep production.

The dynamics indicators based on a variable basis are defined as follows (Starzynska, 2002):

$$i = \frac{y_n - y_{n-1}}{y_{n-1}} \quad \text{or} \quad i = \frac{y_n - y_{n-1}}{y_{n-1}} \cdot 100\% \quad (1)$$

where: y_n - the level of the phenomenon in a certain period, y_{n-1} - the level of the phenomenon in the previous period.

The Gini coefficient is a measure of the concentration (unevenness) of the distribution of a random variable. If the observations y_i are ordered in ascending order, the coefficient can be saved with the formula (Dixon et al., 1987, Damgaard and Weiner, 2000):

$$G(y) = \frac{\sum_{i=1}^n (2i - n - 1) * y_i}{n^2 * \bar{y}} \quad (2)$$

where: n - number of observations,

where: n - number of observations

y_i - i -observation value,

\bar{y} - average value of all observations, i.e. $\bar{y} = \frac{1}{n} \sum_{i=1}^n y_i$

The Lorenz curve determines the degree of concentration of a one-dimensional distribution of a random variable (Dagum, 1980). With sorted y_i observations that take non-negative values $0 \leq y_1 \leq y_2 \leq \dots \leq y_n$,

$\sum_{i=1}^n y_i > 0$, the Lorenz curve is a polygonal chain, which vertices (x_h, z_h) , for $h = 0, 1, \dots, n$ (fixed number),

have coordinates

$$x_0 = z_0 = 0, \quad x_h = \frac{h}{n}, \quad z_h = \frac{\sum_{i=1}^h y_i}{\sum_{i=1}^n y_i} \quad (3)$$

The Gini coefficient determines the area between the Lorenz curve and the diagonal of a unit square multiplied by 2.

Pearson's linear correlation coefficient is a measure of the strength of a straight line relationship between two measurable features. It is expressed by the formula (Jajuga and Walesiak, 2004):

$$r_{XY} = \frac{C(X,Y)}{\sqrt{S_X^2 \cdot S_Y^2}} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \cdot \sum_{i=1}^n (y_i - \bar{y})^2}} = \frac{C(X,Y)}{S_X \cdot S_Y} \quad (4)$$

where: $C(X,Y)$ – covariance between X and Y features,

S_X^2 - X feature variance,

S_Y^2 - Y feature variance,

S_X - X feature standard deviation,

S_Y - Y feature standard deviation.

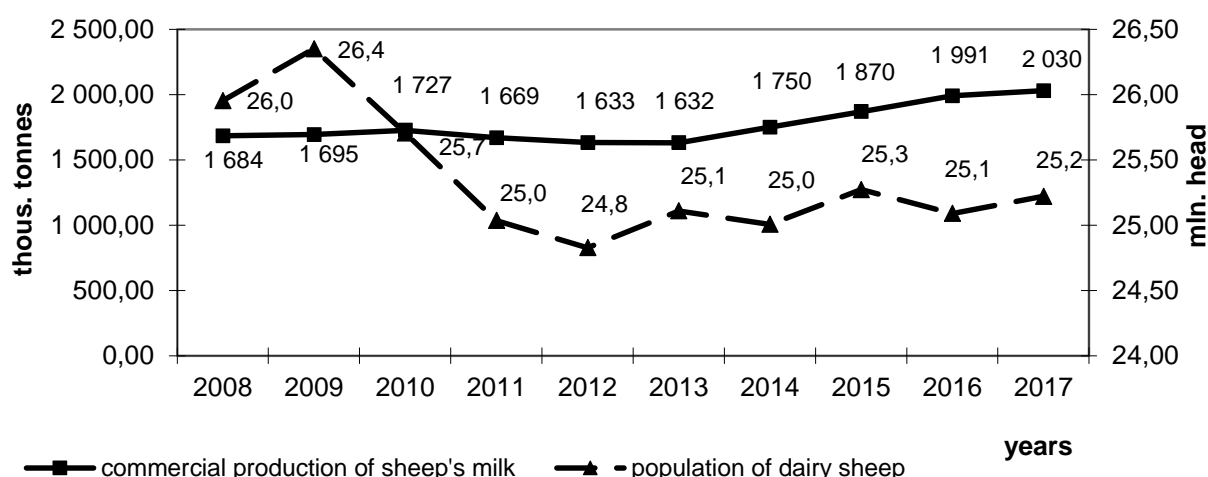
The linear correlation coefficient can be treated as normalized covariance. Correlation always takes values in the range $(-1, 1)$.

Research results and discussion

The factor determining milk production in a direct way is the sheep population, and especially the population of ewes used for milk. In the years 2008-2017, the total sheep population in the EU countries fell from 90.7 million pieces to 86.8 million pieces. At the same time, the population of sheep used for milk production remained at a similar level of around 25-26 million pieces, i.e. it accounted for 28-29 % of the entire sheep population (Figure 1). In the years 2008-2017, the production of milk intended for processing in dairies increased by 21 %, although in the initial years of this period there were even drops. The presented data suggest that less milk was spent on internal consumption of farms and more on processing in dairies. In the years 2008-2017, the production of cheese increased by 48 % from 157 thousand tons up to 232 thousand tons.

Commodity production of sheep's milk was concentrated in countries with the largest stock of milk ewes, i.e. in Greece, Spain, Italy and France. The smallest production occurred in countries with small sheep populations and maintaining meat breeds. In 2008-2017, there were changes in the production of sheep's

milk in particular countries. Table 1 presents the dynamics of changes in sheep milk production in individual EU countries. The changes were shown using chain indexes, where the previous year was accepted as 100. The countries were ranked in descending order according to the production volume of sheep's milk. Changes in individual countries varied. After a period of decline, the increase was most often recorded in subsequent years. The biggest decreases in the leading producers of sheep's milk were recorded in 2011 and 2017, while the largest increases in 2014-2016. It may seem that the production of sheep's milk has little to do with the economic situation. In 2008-2017, the highest increase in sheep milk production was recorded in Bulgaria (by 61 %) and Austria (by 25 %). However, these were countries with a small scale of production. Among the leading producers of sheep milk, only a small increase was recorded in Greece (by 7 %). In other countries there was stagnation or declines.



Source: authors' elaboration

Fig. 1. Population of dairy sheep and commercial production of sheep's milk in the EU in 2008-2017

Table 1

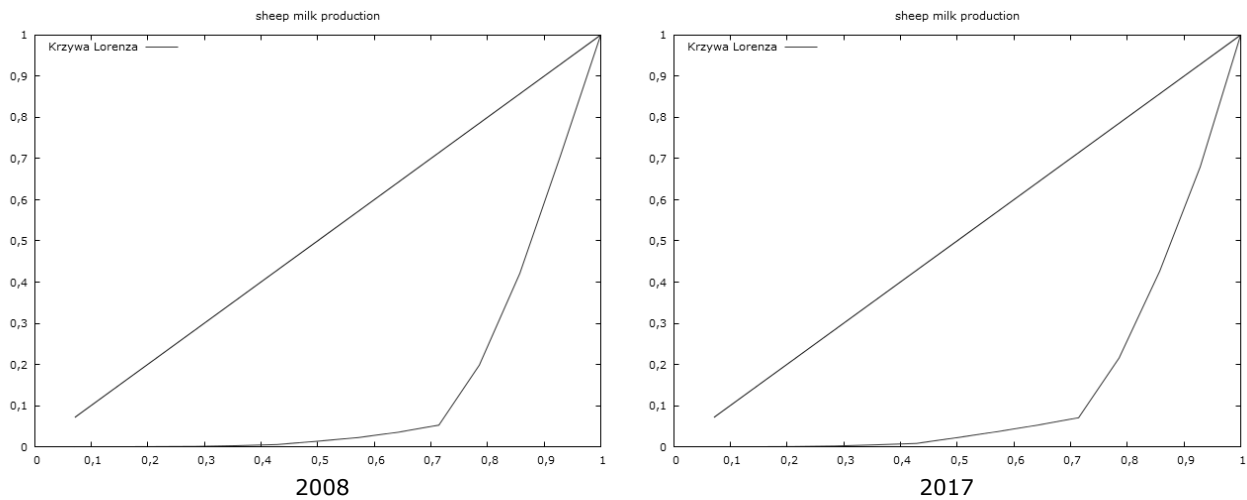
The dynamics of changes in commercial production of sheep's milk in individual EU countries in 2008-2017 (previous year = 100)

Countries	Changes in commercial production of sheep's milk in years									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Greece	100.0	106.8	97.2	90.9	101.4	109.4	99.4	97.5	109.0	97.1
Spain	100.0	99.6	101.6	96.4	101.1	102.8	122.3	95.1	85.1	95.1
Italy	100.0	92.0	106.7	99.0	99.8	97.6	102.7	109.9	100.2	94.1
France	100.0	102.4	103.3	96.7	96.9	98.3	103.8	100.7	105.8	93.4
Bulgaria	100.0	115.1	78.6	85.9	138.6	92.2	104.7	72.2	153.5	139.9
Cyprus	100.0	131.3	71.9	107.6	96.1	92.6	149.2	78.9	115.0	91.4
Romania	100.0	100.7	118.6	73.2	125.6	104.7	130.9	72.3	101.5	82.3
Portugal	100.0	96.2	114.5	84.2	120.8	89.0	99.0	111.8	97.2	93.5
Slovakia	100.0	99.1	117.0	78.9	114.7	105.8	116.9	69.7	119.1	89.5
Austria	100.0	116.8	93.1	96.9	115.1	80.2	93.9	139.8	68.1	144.1
Croatia	100.0	288.4	35.2	98.9	104.6	88.4	120.0	83.5	118.1	83.0
Hungary	100.0	112.5	101.2	72.8	122.4	54.3	186.4	112.4	104.0	98.8
Poland	100.0	142.9	28.0	875.0	28.6	92.9	165.7	100.8	68.7	93.9
Belgium	100.0	200.0	75.0	66.7	100.0	66.7	150.0	700.0	14.3	100.0

Source: authors' elaboration

The Gini coefficient was used to determine the concentration of sheep milk production in EU countries. The data concerned the years 2008 and 2017, and the number of observations was 14. In 2008, the Gini coefficient calculated from the sample was 0.72, and the estimated coefficient for the population 0.78. This

means a very high concentration of sheep's milk production and diversity in EU countries. In addition, these differences are presented in the Lorenz concentration curve (Figure 2). In 2017, Gini coefficients were at a similar level as in 2008 (from the 0.71 sample, estimated at 0.77). This means that the high concentration of sheep milk production has been maintained and No changes occurred.



Source: authors' elaboration

Fig. 2. Lorenz concentration curve for the commercial production of sheep's milk in the EU countries in 2008 and 2017

Table 2

Pearson correlation coefficients between commercial production of sheep's milk in top 14 EU countries and selected parameters in 2008-2017

Parameters	Pearson linear correlation coefficients in years										2008-2017
	2008	2009	2010	2011	2012	2013	2014	2016	2016	2017	
The coefficients of correlation between commercial production of sheep's milk and											
Value of GDP	0.649	0.620	0.605	0.614	0.611	0.571	0.549	0.554	0.548	0.522	0.581
p value	0.012	0.018	0.022	0.019	0.020	0.033	0.042	0.040	0.042	0.056	0.001
GDP per capita	0.372	0.365	0.327	0.292	0.257	0.224	0.203	0.202	0.189	0.163	0.256
p value	0.191	0.200	0.254	0.311	0.374	0.441	0.486	0.489	0.517	0.578	0.002
Household consumption per capita	0.467	0.465	0.435	0.401	0.358	0.322	0.299	0.299	0.285	0.262	0.356
p value	0.092	0.094	0.120	0.155	0.209	0.261	0.299	0.300	0.323	0.366	0.001
Value of export	0.518	0.475	0.465	0.485	0.494	0.463	0.446	0.453	0.438	0.413	0.460
p value	0.058	0.086	0.094	0.079	0.073	0.096	0.110	0.104	0.117	0.142	0.001
Value of import	0.565	0.515	0.503	0.504	0.490	0.447	0.427	0.434	0.415	0.393	0.462
p value	0.035	0.060	0.067	0.066	0.076	0.109	0.127	0.121	0.140	0.164	0.001
Sheep population total	0.745	0.736	0.779	0.797	0.777	0.781	0.814	0.826	0.808	0.777	0.776
p value	0.002	0.003	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Sheep milk population	0.690	0.686	0.716	0.684	0.663	0.656	0.615	0.594	0.597	0.609	0.646
p value	0.006	0.007	0.004	0.007	0.010	0.011	0.019	0.025	0.024	0.021	0.001
Sheep meat production	0.699	0.714	0.730	0.688	0.680	0.649	0.684	0.697	0.688	0.647	0.678
p value	0.005	0.004	0.003	0.007	0.007	0.012	0.007	0.006	0.007	0.012	0.001

Source: authors' elaboration

In order to establish the relationship between the production volume of sheep's milk in the European Union countries and the basic parameters of sheep production and the economy, Pearson's linear correlation coefficients were calculated (Table 2). The $p = 0.05$ was assumed as the threshold of significance level. Significant results have been marked with a grey background in the table. Correlation coefficients have been calculated for EU countries in individual years as well as in the entire period 2008-2017. The paper

tried to check the correlation, which does not indicate that a given factor affects another, only that there is a strong or weak relationship between them.

Significant average positive relationships between the production volume of sheep's milk and the GDP value were found. These dependencies gradually weakened in subsequent years. In the case of other parameters of the economy, No significant dependence was found on the production volume of sheep's milk. There was also a very high positive relationship between the production of sheep's milk and the parameters related to sheep production, such as sheep stock, dairy sheep population, and production of lamb meat. Of these parameters, the impact of the population of dairy sheep was the smallest.

Products of dairy sheep are very much linked to historical and cultural uniqueness right through the production, marketing and consumption chains (Boyazoglu and Morand-Fehr, 2001). According to Haenlein (2007) and Astruc et al. (2002), higher milk production may be due to genetic selection of animal and better nutrition conditions. Some sheep breeds can produce more than 1000 kg milk in one lactation. Sheep feeding also affects the quality of milk determined by the content of food ingredients, such fat, protein etc. (Pulina et al., 2005). In recent years, several traits linked with functional longevity of dairy sheep's (udder morphology, somatic cell count, etc.) are taking on a more important role (Ugarte and Gabina, 2004). Very important is lamb production, which accounts for a substantial part of income for dairy sheep farmers, e.g. 25 to 35 % in Slovakia, 30 to 60 % in the Mediterranean countries (Krupova et al., 2009; Rokicki, 2015).

Conclusions

- 1) Based on the empirical studies presented in the work, some generalisations and conclusions have been formulated. In 2008-2017, the production of sheep's milk intended for processing in dairies increased, which might have been a result from the less internal consumption of farms. Among the leading producers of sheep milk, only a small increase was recorded in Greece. In other countries there was stagnation or declines. In particular years there were declines and increases in production, which may have been caused by more or less favourable climatic conditions occurring in the given years.
- 2) The first hypothesis was rejected. In 2008-2017, the level of concentration of sheep milk production in the EU was very high, but there were No changes in this regard. Commercial production of sheep's milk was concentrated in several countries, like Greece, Spain, Italy and France. Second hypothesis assumed, that commercial production of sheep's milk was more correlated with the population of dairy sheep than with other parameters related to sheep production. This hypothesis was rejected, too. For all the parameters, correlations were very high, but sheep population and lamb meat production were correlated more with milk production.

Bibliography

1. Al-Wabel, N.A. (2008). Mineral Contents of Milk of Cattle, Camels, Goats and Sheep in the Central Region of Saudi Arabia. *Asian Journal of Biochemistry*, 3(6), pp. 373-375.
2. Astruc, J.M., Barillet, F., Barbat, A., Clement, V., Boichard, D. (2002). Genetic Evaluation of Dairy Sheep in France. *7th World Congress on Genetics Applied to Livestock Production*, Montpellier, France, pp. 231-234.
3. Barłowska, J., Szwałkowska, M., Litwinczuk, Z., Krol, J. (2011). Nutritional Value and Technological Suitability of Milk from Various Animal Species Used for Dairy Production. *Comprehensive Reviews in Food Science and Food Safety*, 10(6), pp. 291-302.
4. Bawa, S. (2003). An Update on the Beneficial Role of Conjugated Linoleic Acid (CLA) in Modulating Human Health: Mechanisms of Action-a Review. *Polish Journal of Food and Nutrition Sciences*, 12(3), pp. 3-13.
5. Boyazoglu, J., Morand-Fehr, P. (2001). Mediterranean Dairy Sheep and Goat Products and Their Quality: A Critical Review. *Small Ruminant Research*, 40(1), pp. 1-11.
6. Dagum, C. (1980). The Generation and Distribution of Income, the Lorenz Curve and the Gini Ratio. *Economie Appliquée*, 33, pp. 327-367.
7. Damgaard, C., Weiner, J. (2000). Describing Inequality in Plant Size or Fecundity. *Ecology*, 81, pp. 1139-1142.
8. Dankow, R., Pikul, J. (2011). Przydatność technologiczna mleka owczego do przetwórstwa (Technological Suitability of Sheep Milk for Processing). *Nauka Przyroda Technologie*, 5(2), pp. 7.

9. Dario, C., Carnicella, D., Dario, M., Bufano, G. (2008). Genetic Polymorphism of β -lactoglobulin Gene and Effect on Milk Composition in Leccese Sheep. *Small Ruminant Research*, 74(1-3), pp. 270-273.
10. de la Fuente, M.A., Mercedes, R., Isidra, R., Manuela, J. (2013). Sheep Milk. *Milk and Dairy Products in Human Nutrition: Production, Composition and Health*, Park Y.W., Haenlein G.F.W. (ed.), John Wiley & Sons Ltd., New York, pp. 554-577.
11. Dixon, P.M., Weiner, J., Mitchell-Olds, T., Woodley, R. (1988). Erratum to Bootstrapping the Gini Coefficient of Inequality. *Ecology*, 69, p. 1307.
12. Faostat (2017). *Sheep Milk, Whole, Fresh*. Retrieved: <http://www.fao.org/faostat/en/#data/QL> Access: 30.01.2019.
13. Gavino, V.C., Gavino, G., Leblanc, M.J., Tuchweber, B. (2000). An Isomeric Mixture of Conjugated Linoleic Acids but not Pure cis-9, trans-11-octadecadienoic Acid Affects Body Weight Gain and Plasma Lipids in Hamsters. *The Journal of Nutrition*, 130(1), pp. 27-29.
14. Haenlein, G.F.W. (2007). About the Evolution of Goat and Sheep Milk Production. *Small Ruminant Research*, 68(1-2), pp. 3-6.
15. Jajuga, K., Walesiak, M. (2004). *Remarks on the Dependence Measures and the Distance Measures*. In: Klasyfikacja i analiza danych - teoria i zastosowania, Prace Naukowe Akademii Ekonomicznej we Wrocławiu nr 1022, AE, Wrocław, pp. 348-354.
16. Krupova, Z., Wolfova, M., Wolf, J., Oravcova, M., Margetin, M., Peškovicova, D., Krupa E., Dano, J. (2009). Economic Values for Dairy Sheep Breeds in Slovakia. *Asian Australasian Journal of Animal Science*, 22, pp. 1693-1702.
17. *Milk and Milk Product Statistics* (2017). Eurostat Statistical Explained. Retrieved: https://ec.europa.eu/eurostat/statistics-explained/index.php/Milk_and_milk_product_statistics Access: 30.12.2018.
18. O'shea, M., Bassaganya-Riera, J., Mohede, I.C. (2004). Immunomodulatory Properties of Conjugated Linoleic Acid. *The American Journal of Clinical Nutrition*, 79(6), pp. 1199-1206.
19. Park, Y.W., Juarez, M., Ramos, M., Haenlein, G.F.W. (2007). Physico-chemical Characteristics of Goat and Sheep Milk. *Small Ruminant Research*, 68(1-2), pp. 88-113.
20. Parodi, P.W. (1999). Conjugated Linoleic Acid and Other Anticarcinogenic Agents of Bovine Milk Fat. *Journal of Dairy Science*, 82(6), pp. 1339-1349.
21. Pulina, G., Macciotta, N., Nudda, A. (2005). Milk Composition and Feeding in the Italian Dairy Sheep. *Italian Journal of Animal Science*, 4(sup1), pp. 5-14.
22. Rokicki, T., (2015). Economic Results of Sheep Farms in Poland, *Economic Science for Rural Development, Economic Science for Rural Development. Proceedings of the International Scientific Conference*, No 37, pp. 86-92.
23. Rokicki T., (2017). Food security in the European Union – case study of lamb market, *Economic Science for Rural Development, Economic Science for Rural Development. Proceedings of the International Scientific Conference* No 45, pp. 344-350.
24. Rokicki T., Ratajczak M., 2018: Segmentation of the EU countries in terms of the sheep production, *Economic Science for Rural Development, Economic Science for Rural Development. Proceedings of the International Scientific Conference*, No 48, pp. 229-236.
25. Sinanoglou, V.J., Koutsouli, P., Fotakis, C., Sotiropoulou, G., Cavouras, D., Bizelis, I. (2015). Assessment of Lactation Stage and Breed Effect on Sheep Milk Fatty Acid Profile and Lipid Quality Indices. *Dairy Science & Technology*, 95(4), pp. 509-531.
26. Starzynska, W. (2002). *Statystyka praktyczna (Practical Statistics)*, Wydawnictwo Naukowe PWN, Warszawa, p. 102.
27. Talpur, F.N., Bhangar, M.I., Khooharo, A.A., Memon, G.Z. (2008). Seasonal Variation in Fatty Acid Composition of Milk from Ruminants Reared under the Traditional Feeding System of Sindh, Pakistan. *Livestock Science*, 118(1-2), pp. 166-172.
28. *The Sheep and Goat Sector in the EU. Main Features, Challenges and Prospects* (2017). Briefing September 2017, European Parliament, Brussels.
29. Tricot, S., Burdge, G.C., Kew, S., Banerjee, T., Russell, J.J., Jones, E.L., Calder, P.C. (2004). Opposing Effects of cis-9, trans-11 and trans-10, cis-12 Conjugated Linoleic Acid on Blood Lipids in Healthy Humans. *The American Journal of Clinical Nutrition*, 80(3), pp. 614-620.
30. Ugarte, E., Gabina, D. (2004). Recent Developments in Dairy Sheep Breeding. *Archiv fur Tierzucht*, 47(6; SPI), pp. 10-17.
31. Wang, Y., Jones, P.J. (2004). Dietary Conjugated Linoleic Acid and Body Composition. *The American Journal of Clinical Nutrition*, 79(6), pp. 1153-1158.
32. Watkins, B.A., Seifert, M. F. (2000). Conjugated Linoleic Acid and Bone Biology. *Journal of the American College of Nutrition*, 19(4), pp. 4785-4865.

RISK MANAGEMENT IN SMALL FAMILY FARMS IN POLAND

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Abstract. Small farms play an important role in the sustainable development of rural areas. However, the data indicate that their number has been gradually decreasing. The reason for this reduction is the low profitability of production, combined with the uncertainty created by the high risk of agricultural production. In this context, it is important to create an appropriate risk management strategy that will ensure stable income and allow continuing agricultural production. The aim of the publication is to assess the activities of small farms in terms of price and production risk management. The paper also presents a relationship between the range of instruments used and the basic characteristics of farms. Finally, the agricultural households are assessed from the point of view of the methods of production planning. The article uses unpublished data from a questionnaire survey conducted on a group of 710 small farms in Poland at the turn of 2017/2018. The results of the analysis indicate that the level of risk management in the studied group is very small. The only commonly used instrument included obligatory insurance of production facility. Every third producer insured crops, and every fourth diversified production. The remaining methods were used very rarely. In addition, most farms used only one or two risk management instruments. A positive correlation was found between the number of the management tools used and the level of manager's education, the size of agricultural area, the level of estimated income and the share of goods sold on the market.

Key words: small farms, risk management, Poland, questionnaire survey.

JEL code: D81, Q12.

Introduction

Agricultural activity, like any other economic activity, is accompanied by uncertainty and the consequences of decisions made by the agricultural producer may be at risk. The relationship between uncertainty and risk seems clear, as both phenomena are characterized by a high degree of random variation, and the level of uncertainty and risk depends to a large extent on how extensive information about the market we have. In fact, we never have full information and, as a result, uncertainty and risk are permanent elements of the functioning of business entities. It can also be said that in agriculture information is highly imperfect (Bocker A., Herrmann R., 2004; Sheldon I.M., 1996), hence the sector is particularly exposed to various risks. In practice, the two most common types of risk are price risk, due to the low elasticity of supply and demand in the agricultural sector, as well as the biological nature of production, which leads to price fluctuations (eg. on the pig market) and production risk related to external factors (mainly weather) influencing achieved effects³ (Nather M., Theuvsen L., 2012). They cause high income volatility in both the one-year and the many-year periods, which may result in farmers abstaining from investments or optimal use of resources, and eventually lead to withdrawal from the market. Only in 2010-2016, the number of farms in Poland decreased by 100,000, including the smallest ones, to 5 ha of UAA, by 55 thousand (Statistical Yearbook ... 2017), mainly due to low profitability of production. The latter number is worried above all taking into account the fact, that small farms plays an exceptional role in the sustainable development of rural areas. Their contribution to the creation of social and environmental balance in the countryside is particularly important (Czyzewski A., Stepień S., 2013; Zegar J.S., 2012), but this requires a guarantee of maintaining relatively favourable and stable income relations. Moreover, as emphasized by T. Wojewodzic (2014), for the implementation of environmental functions by small farms it is necessary to conduct active agricultural activity (otherwise, the so-called environmental costs of land

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³ Other risks include institutional (administrative) risk related to the volatility of agricultural policy; financial risk referring to a case of excessive use of external sources of financing (eg. increase in interest rate); personal risk, such as, for example, farmer's health status (illness, accidents).

abandonment, i.e. uncontrolled development of weeds, could arise). In this context, an appropriate risk management strategy in agricultural activity becomes very important, the effects of which will positively affect the development of agricultural holdings, including small food producers.

In practice, a farm has a choice of four risk minimization strategies in agricultural production, namely: risk avoidance, referring to the withdrawal from activities exposed to loss; stopping the risk, by financing loss inside the holding; risk control, including actions to prevent the negative effects of price and production volatility; and risk transfer, i.e. the transfer of its part to another entity (Klimkowski C., 2007). The first of these methods is undoubtedly the most effective, however, it leads to the loss of long-term income from a given activity. It is also difficult to apply due to the low flexibility of the assets involved in agricultural production and large exit barriers. Stopping the risk, on the other hand, requires large financial capital or obtaining credit/loan in case of declining profitability of farming, which is difficult for many smaller farms to meet. As part of risk control, one can mention diversification of activities, participation in coordinated production systems (groups of agricultural producers, cooperatives), transactions on the commodity exchange. Finally, as part of the risk transfer, an insurance contract is agreed between the agricultural holding and the financial institution (Anton J., 2011). The aim of the publication is to assess the activities of small farms in terms of price and production risk management. It is about indicating which instruments are used by the farms and how many selected methods they implement. The work focuses on the last two of the aforementioned strategies, i.e. control and transfer of risk, which, according to the authors, are the most effective for those small farms that plan to continue farming. The article also presents the relationship between the range of instruments used and the basic characteristics of the farm - age, education of manager, size of farm and type of production, estimated income and share of agricultural production on the market. At the end, the agricultural households are assessed from the point of view of the method (sources) of production planning. The way in which farms plan production and what information they possess has a significant impact on future economic results and, combined with selected risk management instruments, is a comprehensive strategy for minimizing losses/maximizing effects. The publication uses unpublished data from a questionnaire survey⁴ conducted on a group of 710 small farms in Poland at the turn of 2017/2018. The data was collected by direct interviews conducted by specialized agricultural advisors cooperating with farms under the FADN system. The target group was divided into farms participating in the agricultural accounting system and the so-called „twin farms”, similar in size and structure to FADN holdings. The spatial scope of the study concerned all 16 regions in Poland (voivodships). Since there is no unambiguous definition of a small farm, for the purposes of the study its definition was adopted on the basis of two criteria: 1) standard output⁵ (SO) below or equal to 15,000 euro, 2) as a „semi-subsistence farm” where less than 50 % of the agricultural output is sold, with the remainder being consumed within the farm household. A simple descriptive statistics and average values were used to describe the structure of the studied group and the relationship between particular variables. Due to the originality of the data, the work is innovative and the collected information has applicative value, for example in the context of policy for small farms.

Research results and discussion

Part of a wider survey of small farms was to obtain information on risk management. One of the questions addressed to respondents concerned the method of production and/or price risk management in

⁴ The presented analysis is part of a wider study on the sustainability and food security of small farms in the countries of Central and Eastern Europe.

⁵ Standard output is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. There is a regional SO coefficient for each product, as an average value over a reference period of 5 years. The sum of all the SO per hectare of crop and per head of livestock in a farm is a measure of its overall economic size.

their agricultural holding. The results indicate that out of the 710 small farms surveyed, the largest group - 352 units - used only one selected method of risk reduction in agricultural production (for the most of them it was an obligatory insurance of production facilities). 244 farms used 2 risk management strategies, 68 - 3 strategies, and 17 - 4. The choice of 5 or 6 answers did not appear even once (Table 1). At the same time, 29 entities did not secure any of the methods mentioned in the question

Table 1

The structure of small farms in Poland, by form of risk management and the number of methods used (results of questionnaire)

Method of price/ production risk management	Number of farms	Percentage*	Number of methods used	Number of farms	Percentage
Insurance of farm buildings and machinery	649	91.4 %	0	29	4.1 %
Crops insurance against weather risk	223	31.4 %	1	352	49.6 %
Sales contracting	35	4.9 %	2	244	34.4 %
Membership in producer group/ cooperative	30	4.2 %	3	68	9.6 %
Transactions on commodity exchange	6	0.8 %	4	17	2.4 %
Diversification of production	169	23.8 %	5	0	0.0 %
None of mentioned above	29	4.1 %	6	0	0.0 %

*Percentages do not add up to 100 due to the possibility of choosing more than 1 answer.

Source: authors' calculations based on own questionnaire survey

Due to legal requirements, the most commonly method used to secure agricultural production was an insurance of machines and farm buildings (related mainly with such random events as fire, hurricane and flood), and second place belonged to an insurance against weather risks. While the first of these methods was indicated by the overwhelming majority of farms (649 responses, which means that not all producers fulfilled the statutory obligation), in the second case only slightly more than 30 % of respondents. In the future, however, one can expect an increase in interest in insurance, as they are becoming a more and more popular tool for risk management, including risk of fluctuating, unstable income. Such instruments on a large scale are used, for example, in the United States (Goodwin B.K., 2010), and in recent years also in the European Union, along with the introduction of the so-called Income Stabilization Tool (Tropea F., 2016). They are also increasingly used among small, family farms in developing countries (Poole N., 2017), as well as in China (Jian W., Rehman A., 2016). In the long term the widespread adoption of this instrument for small agricultural producers will be associated with economic availability, which requires state involvement in co-financing the system. With current income relations, the majority of small farms in Poland are unable to bear the additional cost of the policy and resign from this solution (Kobus P., 2013)

As for the other forms of risk management, almost every fourth farmer diversified production in order to spread the risk, e.g. price fluctuations or poor crops. The other methods of risk management were used by a very small group of the agricultural producers - less than 5 % used contracting for the sale of agricultural products, slightly more than 4 % belonged to a producer group or cooperative, and less than 1 % contained transactions on the commodity exchange. In the latter case, an equally low result was also obtained for observations in Germany. Local farmers prefer the contracting system as a form of hedging against price fluctuations expecting that their marketing partners will use more complicated stock exchange operations (Theuvsen L., 2013).

Interesting results are provided by a description of the basic characteristics of agricultural holdings. It turns out that there is some relation between the number of methods used to manage production and price risks and such variables as the level of education of the agricultural producer, the size of the farm and the type of production (Table 2). The more educated the owner of the farm, and therefore the more comprehensive the knowledge, the more risk mitigation strategies are used. A similar positive relation applies to the area of agricultural land. This may be explained by the fact that the larger the holding is, the greater the share of income from agricultural production in the total income of the household and the greater part of commodities goes to the market (which is also confirmed by the survey data). In the group of farms that do not use any risk management strategy, on average about half of the produced production goes to the market, the second part is dedicated to self-supply.

Table 2

Basic characteristics of small farms in Poland in relation to the number of methods used for risk management (results of questionnaire)

Characteristics	Number of methods of risk management used in farm				
	0	1	2	3	4
Age	51.5	48.7	48.5	45.0	51.0
Index of education*	4.3	4.6	4.7	5.1	5.4
Farm size (ha UAA)	12.2	13.2	14.5	17.3	17.6
Dominant type of production** (percentage of all farms)	7 (38 %)	7 (33 %)	1 (41 %)	1 (57 %)	1 (65 %)
Share of agricultural income in total income of household	72.9 %	79.8 %	84.4 %	87.5 %	88.9 %
Share of agricultural production sold on the market	52.0 %	59.9 %	68.2 %	73.1 %	72.8 %
Estimated monthly income per one member of household (PLN)	784	826	898	922	1256

*Average of the following classes: 1 - No education 2 - primary, 3 - secondary, 4 - vocational, 5 - general 6 - higher bachelor degree, 7 - higher master degree.

** 1 - field crops; 7 - mixed production (No dominant of animals of crops production).

Source: authors' calculations based on own questionnaire survey.

On the opposite side, on farms using 4 different forms of risk reduction, almost 3/4 of production is allocated for sale, and only slightly more than 1/4 goes to the needs of the family. Hence as a result of unforeseen random events the risk of losing the main source of income in this group of households is higher. Therefore, an appropriate strategy is needed to counteract the negative effects of these situations. All the more so because there is a connection between an increase in the area of arable land and a rise in a production specialization level (in our case it is a specialization in field crops), and therefore the use of diversification of agricultural activity as a risk management method loses its importance (Stepien S., 2007).

In addition to the mentioned relation, one more was observed - the higher income per member of the household corresponds to the greater number of applied risk management strategies. One may wonder about the cause-and-effect relationship, but it would require a broader analysis that goes beyond the scope of the article. According to the authors, higher incomes are a dependent variable in relation to the specialization and scale of production (in the case of crop production inseparable from the area of arable land). In this situation, the use of risk management tools is primarily a direct consequence of the decision to expand business, not the fact of having more capital, although its lack may, for example, limit the farm's ability to obtain insurance (Lorant A., Farkas M.F., 2015). Moreover, at a higher production scale, losses resulting from negative events (e.g. unfavourable climatic conditions) are more intense, which explains why the farmer becomes more willing to use selected forms of risk reduction. Finally, if we take into account the division of farms into production types, two of them dominate - field crops and mixed production. In the first case, the number of risk management methods applied is higher (minimum 2), while in farms with

a mixed production a result is 0 or 1. The relation between farm specialization and the farmer's attitude to risk management is confirmed again.

Another important aspect in the context of risk reduction in production, associated primarily with cyclical and/or seasonal fluctuations in prices of agricultural commodities, refers to the assessment of business planning. In the literature, we can meet four approaches in this subject, taking into account the impact of price expectations on future decisions of producers. These are naive, adaptive, quasi-rational and rational expectations (Tomczyk E., 2011; Irwin S.H., Threan C.S., 1994). In the first case, it is assumed that future values of demand, supply and prices will be the same as recently observed. This attitude usually leads to wrong decisions. Due to changes in the above-mentioned values over time, there is a discrepancy between market conditions and the producer's decisions. In adaptive expectations, decisions are adjusted accordingly to the recent error, which allows avoiding mistakes made recently, but does not guarantee their avoidance in the event of other, previously unknown circumstances. The basis for quasi-rational expectations includes predictions based on time series of relevant variables. If the data is properly selected and the analysis is methodologically correct, then there is a high probability of making the right decisions. Finally, rational expectations are coherent and convergent with the anticipated market situation regarding the demand and supply of a given good. In this case, extensive knowledge of market conditions and access to reliable information is necessary.

From the point of view of the efficiency of risk management, it is advisable to follow rational or quasi-rational expectations. The level to which they will be used depends to a large extent on the costs associated with obtaining information. When new information is expensive or difficult to access, producers will use naive expectations. However, because the ability to acquire and process information is an individual human characteristic (which results from differences in intellect, education, experience, etc.), the expectations of individual farms will be strongly diversified, which is confirmed by the results of the analysis carried out in the US by J.P. Chavas (1999). The author indicates that over 70 % of producers in their decisions are guided by quasi-rational or adaptive expectations. Fully rational units account for approx. 20 %, and on the other hand, over 7 % of households behave naively, assuming market conditions such as previously observed in their predictions. Similar research took place in Poland by A. Szemberg (1997). The results show that most agricultural producers do not see the impact of demand on price changes assuming that the increase in production will always lead to an increase in sales revenues (naive expectations). Therefore, they assume that in the future purchase prices and their relations will be at the same level as at the moment of making decisions. Meanwhile, due to the relative low elasticity of food demand, the increase in supply leads to a price drop more than proportionally. On a macroeconomic scale, such a situation occurs in the period of above-average crops, which leads to the so-called fertility calamity (overproduction crisis).

Referring the above information to the results of the survey, it can be stated that in the case of small farms, their decisions are far from reasonable. As many as 31 % of the respondents do not create any plans for their activities, and another 42 % plan production in relation to the current market situation. Less than 15 % of farmers use supporting information from colleagues/neighbours, and only every 13th farm uses stock market forecasts to plan future operations, i.e. behaves rationally. This may suggest the lack of sufficient economic knowledge among the producers, although in comparison with the question about the source of agricultural information, such a result may come as a surprise. Almost 80 % of the respondents use the services of an agricultural adviser, more than half declare that they read specialist press and almost half participate in various types of courses and training. It could be concluded that either the level of knowledge transferred is modest or the perception of information is low.

Conclusions

On the basis of the assessment of price and production risk management among the group of small farms in Poland, the following conclusions can be made.

- 1) The data indicate that the level of awareness of risk management among small farms in Poland is low, as evidenced by the small number of methods used for this purpose, and the tools used are limited to the simplest and most common ones.
- 2) Most households have insured buildings and machinery (partly mandatory), every third insured crops, and nearly one in four diversified production. Other methods, such as contracting, sales within a producer group/cooperative or transactions on the commodity exchange, turned out to be not popular.
- 3) The reasons for the low involvement of small agricultural producers in the development of risk management strategies can be attributed to: lack of knowledge on the subject, lack of capital necessary e.g. for the purchase of insurance policy, lack of interest due to small scale of agricultural production and potentially small losses or lack of trust to financial institutions (in the case of insurance and stock exchange transactions), purchasers/intermediaries (in the case of contracting contracts), other agricultural producers (in the case of producer groups/cooperatives).
- 4) Proper planning is necessary for effective risk management in agricultural production. Meanwhile, the data indicate that the majority of respondents either do not create plans at all or plan to produce *ad hoc* without a thorough analysis of the market situation. Only a small part admitted that they take into account market analyses when making production decisions. This situation is not improved by the use of consultancy services, participation in courses/trainings or reading professional magazines;
- 5) The level of use of risk management instruments is not the same in the surveyed group. Higher engagement occurs in case of larger farms, with higher income per family member, higher market share, managed by a more educated person.
- 6) From the point of view of the economic, social and environmental sustainability of rural areas, the existence of small farms is crucial. To maintain their continuity, it is necessary to ensure relatively stable conditions for their development, in which the risk management strategy plays an important role. In Poland, in relation to small farms, such solutions would be connected with launching mechanisms strengthening the farmer's position in the food chain, eg setting up local food markets, introducing incentives for farmers' cooperation, for example in the form of tax relief, preferential support schemes, special programs under the second pillar of the Common Agricultural Policy. Due to the low level of participation, as well as education of small agricultural producers, a greater transfer of knowledge is necessary. A large role in this task should fall to agricultural advisory centers, as the closest to a farmer, as well as institutions related to agriculture and universities.

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Bibliography

1. Anton, J. (2011). *Risk Management in CAP Reform: Policy Insight from OECD Studies* (presentation). Seminar on „Risk Management under the Reformed CAP”, Warsaw, December.
2. Bocker, A., Herrmann, R. (2004). Food Quality, Imperfect Information and the Role of Markets and the State. *Agrarwirtschaft*, No. 53, pp. 301-302.
3. Central Statistical Office (2017). *Statistical Yearbook of Agriculture*. Warsaw, p. 107.
4. Chavas, J.P. (1999). On the Economic Rationality of Market Participants: The Case of Expectations in the U.S. Pork Market. *Journal of Agricultural and Resource Economics*, No. 24, pp. 19-37.

5. Czyzewski, A., Stepień, S. (2013). Ekonomiczno-społeczne uwarunkowania zmian paradygmatu rozwoju rolnictwa drobnotowarowego w świetle ewolucji Wspólnej Polityki Rolnej. *Problems of Small Agricultural Holdings*, no. 2, pp. 25-39.
6. Goodwin, B.K. (2010). *Countercyclical Payments That Mitigate Income or Revenue Variability: Are They Effective?* North Carolina State University, Raleigh (typescript).
7. Irwin, S.H., Threan, C.S. (1994). Rational Expectations in Agriculture? A Review of the Issues and the Evidence. *Review of Agricultural Economics*, No. 16, pp. 133-158.
8. Jian, W., Rehman, A. (2016). *Risk Management in Agriculture: Theories and Methods*. Science Publishing Group, New York, pp. 19-30.
9. Klimkowski, C. (2007). Innowacyjne instrumenty ubezpieczenia rolnictwa. Komunikaty, Raporty, Ekspertyzy, no. 524, Instytut Ekonomiki Rolnictwa i Gospodarki Żywnościowej, Warsaw, p. 13.
10. Kobus, P. (2013). Ryzyko występujące w produkcji roślinnej, metody jego pomiaru. In: Czynniki i możliwości ograniczenia ryzyka w produkcji roślinnej poprzez ubezpieczenia (ed. A. Wicka). SGGW Publishing House, Warsaw, p. 63.
11. Lorant, A., Farkas, M.F. (2015). Risk Management in the Agricultural Sector with Special Attention to Insurance. *Polish Journal of Management Studies*, Vol. 11, No. 2, pp. 71-82.
12. Nather, M., Theuvsen, L. (2012). *Risikomanagement im Pferdebetrieb*. Cuvillier, Goettingen, pp. 14-20.
13. Poole, N. (2017). *Risk Management for Agricultural Smallholders*. In: Smallholder Agriculture and Market Participation (ed. N. Poole). Food and Agriculture Organization of the United Nations and Practical Action Publishing, Warwickshire, pp. 97-101.
14. Sheldon, I.M. (1996). Contracting, Imperfect Information and the Food System. *Review of Agricultural Economics*, Vol. 18, pp. 7-19.
15. Stepień, S. (2007). Znaczenie specjalizacji w kształtowaniu dochodów rolniczych. In: Uniwersalia polityki rolnej w gospodarce rynkowej. Ujęcie makro-i mikroekonomiczne (ed. A. Czyzewski). Publishing House of Akademia Ekonomiczna, Poznań, pp. 209-230.
16. Szemberg, A. (1997). Przemiany agrarne w latach 1992-1996. *Zagadnienia Ekonomiki Rolnej*, No. 4-5, p. 12.
17. Theuvsen, L. (2013). *Risks and Risk Management in Agriculture*. Department of Agricultural Economics and Rural Development, Georg August University of Goettingen, Goettingen, pp. 162-174.
18. Tomczyk, E. (2011). *Oczekiwania w ekonomii*. Oficyna Wydawnicza SGH, Warsaw.
19. Tropea, F. (2016). *New Income Stabilization Tools and Price Volatility in Agricultural Markets*. European Parliamentary Research Service, Brussels, pp. 6-8.
20. Wojewodzik, T. (2015). *Srodowiskowe aspekty likwidacji drobnych gospodarstw rolnych - zarys problemu* (presentation). Ministry of Agriculture and Rural Development, Kraków.
21. Zegar, J.S. (2012). Rola drobnych gospodarstw rolnych w procesie społecznie zrównoważonego rozwoju obszarów wiejskich. *Problems of Small Agricultural Holdings*, No. 1, pp. 129-148.

THE IMPACT OF TERMS OF TRADE SHOCKS ON BALTIC COUNTRIES' AGRICULTURAL INDUSTRY

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Abstract. The aim of the study is to assess the impact of terms of trade shocks on Baltic States' agricultural industry. The research covers period of 2002 – 2017. The study is based on vector autoregression (VAR) methodology. The research encompasses the impulse response function (IRF) evaluation and analysis of the forecast error variance decomposition (FEVD). The impact of terms of trade changeability was subdivided into temporary and permanent effects. The split of the terms of trade affect was attained by time series transformation by means of Hodrick-Prescott filter. The research outcome revealed that temporary terms of trade shocks have an effect on Lithuanian agricultural trade relate this variable to trade balance changes of agri-food goods and to terms of trade development in all considered countries. The IRF function evaluation led to the conclusion that a positive impulse in permanent component of terms of trade causes sharp increase in variables considered in the model. The stabilisation of the system is attained after two periods. The outcome of the FEVD investigation led to the conclusion that terms of trade is the most exogenous factor within the considered system. On the other hand the most endogenous variable is gross value added of agricultural industry (GVA).

Key words: terms of trade, agi-food trade balance, vector autoregression, Baltic States.

JEL code: F19, N50, Q17.

Introduction

Economists point out that the literature bringing up the problems of the impact of the terms of trade fluctuations on the trade balance provide ambiguous instances of that relationship. Ultimately, the influence of terms of trade shocks on current account depends on a bulk of different factors as: the type of the change, duration of the shock, expectations in respect of changes' character, and type of the transmission channel.

Conventional explanation of on the of terms of trade fluctuation influence on trade balance which is associated with names Laursen and Metzler (1950) and Harberger (1950) intimates that the rise in terms of trade leads to an enhance of country's real income. This income rise is expressed as the purchasing ability of that country exports. Economic literature concerning terms of trade changeability and the impact of that quality on trade balance, or more broadly on the current account, generally focused on the way the variations of terns of trade affect private savings. The scientific literature suggests that terms of trade fluctuations may influence national savings and current account. However, the impact of terms of trade changeability could be split into temporary effect and long-run end product.

According to Harberger-Laursen-Metzler effect (HBL) temporary deterioration in terms of trade should lead to a deterioration of the current account as a result of decrease of real income. Consumers in order to maintain their standard life reduce the marginal propensity to save and increase marginal propensity to consume. Worsening relationship of imported / exported goods prices results in the deterioration of trade balance and a decline in national savings (Turnovsky, 1997). The opposite effect triggers temporary improvement in terms of trade which induces improvement in the current account and an increase of national savings. Chowdhury (2003) states that this results from consumers' perception of the income increase as the temporary (as the consequence of terms of trade improvement). Such consumers' expectations regarding character of rising income encourage them to reduce current consumption expenditure and to increase savings.

Laursen and Metzler (1950) acknowledge that deterioration in terms of trade may trigger two opposed absorption effects, namely income effect and substitution effect. Pursuant to the income effect, terms of

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trade deterioration results in a decrease of income, what affects negatively domestic expenditure on imported goods. On the contrary, in line with the substitution effect, suitable increase in prices of foreign goods leads to displacement of appreciating imports by getting cheaper domestic products. Hence, ultimate product of terms of trade shocks on trade balance depends on the magnitude of these two impacts. Income effect prevalence at terms of trade deterioration tends to harm balance of payments. On other hand, dominance of substitution effect at terms of trade deterioration leads to improvement in trade balance. Such approach views trade imbalances as a consequence of domestic absorption. Absorption exceeds income if a country spends above its product. In consequence of exaggerated consumption, the trade balance is in deficit. If a country spends less than it fabricates, income exceeds absorption and its trade balance is in surplus.

When the possibilities of long-run substitution between domestic and foreign goods are considered deterioration in terms of trade (for example, derived from country's currency depreciation) leads ultimately to improvement of that country balance of payments. Although short-run consequences of international markets' prices fluctuations may be well adverse. However, long-run effect of foreign exchange rates control could lead to persistent surpluses or deficits in the trade balance. Therefore, Wang (2009) remarks that Harberger-Laursen-Metzler effect plays a significant role in discussions on effects of national currency depreciation on the balance of payments. Wang argues that assuming other things unchanged, a change in the currency rates which causes an increase in domestic absorption deteriorates trade balance, and any change in exchange rates that results in absorption decrease improves trade balance.

The purpose of the study is to examine the claims made for fluctuating terms of trade of agricultural products and their impact on trade balance of agri-food goods. The study sample consists of three countries: Estonia, Lithuania, and Latvia. The paper is organized as follows: next section first introduces a theoretical background to the research and provides the essence of the methodology. Subsequently, there are discussed the results of the empirical research – models investigating terms of trade impact that are performed for each Baltic State individually. Last section provides a summary and conclusions.

Research results and discussion

The research method

In order to analyse the relationship between terms of trade changes and trade balance of agricultural products and food goods of Baltic States idea of econometric models quoted by Kent and Cashin (2003) was employed. However, for study purposes instead of the term of current account the notion of trade balance was used and the term of GDP (gross domestic product) was replaced with GVA (gross value added) of agricultural industry. These changes were introduced in the aftermath of industry analysis level. Furthermore, instead of panel methodology applied by Kent and Cashin vector autoregression technique (VAR) was employed (Lutkepohl, 1991; Kusiadel, 2000). However, permanent impact of terms of trade changes was evaluated through modification of VAR technique – by means of vector correction model (VECM). The temporary impact of terms of trade shocks was investigated using VAR model.

The data are from statistical database of EUROSTAT. Series are annual from 2002 to 2017. In the sample are three Baltic Countries (Estonia, Latvia, Lithuania). The data concern economic performance of the agricultural industries (GVA - gross value added), terms of trade of the agri-food goods, trade balance of agricultural, and food goods and exports and imports values of agri-food products.

A key objective of the paper is to assess the response of trade balance of agri-food goods to changes in terms of trade of agri-food products. Terms of trade may contain predictable and unanticipated components. Estimates of unanticipated element of terms of trade (shocks) were obtained as the residuals

from filtered series. Namely, the original data representing terms of trade time series were transformed by means of Hodrick-Prescott mathematical filter (Hodrick, Prescott, 1997) in order to subdivide the process into two categories – temporary and permanent components. Therefore, permanent terms of trade changes were estimated by the mean of trend and temporary changes were assessed as cyclical residuals from terms of trend time series after applying mathematical filter (Agénor, Aizenman, 2000). Therefore, assessment of the impact of permanent and temporary terms of trade changes on the trade balance of agricultural industry entailed creation of two models – separately for each terms of trend effect.

Consecutive variables used in the study are coded as follows: hpt_ToT – terms of trade permanent component, hp_ToT – terms of trade temporary component, Rat – exports value / imports value ratio, Bal – trade balance in agri-food goods, GVA – gross value added of agricultural industry. Additionally, a particular model may contain terms as: const – constant, time – time variable, EC1 – error correction term.

Before VAR model parameter estimation, it was essential to assess stationarity of considered time series. KPSS tests of stationarity (Kwiatkowski et al., 1992), revealed that generally examined variables showed evidence of stationarity. Additionally, most of the variables shows evidence of a trend for all countries.

The trade balance response to terms of trade variation and impact of terms of trade changes on GVA of agricultural industry was examined by the mean of VAR methodology. Determination of the model form (VAR or VECM) was achieved by the cointegration likelihood test developed by Johansen (1988). After models' parameter estimation, the statistical quality of the equations was accessed by computing the relevant statistical diagnostics (not presented because of constraints on article volume). Additionally, the research encompassed the impulse response function (IRF) evaluation and the forecast error variance decomposition (FEVD).

1. Terms of trade changes impact on agricultural industry of Estonia

For permanent terms of trade changes Johansen cointegration test based on trace statistical test ($r \geq 1$ $\lambda_{trace} = 10.025$ $p = 0.4857$) and the maximum eigenvalue test ($r = 1$ $\lambda_{max} = 9.918$ $p = 0.4122$) point out the occurrence of one cointegration vector. The outcome involves employment of the VECM for long-run relationship analysis. All time series for Estonia are in logarithms.

Table 1

Assessment of permanent terms of trade changes effect of agri-food goods for Estonia (VECM model)

Model term	Equation for terms of trade permanent component		Equation for exports / imports ratio		Equation for GVA	
	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
const	-0.164	0.0015	-4.738	0.0005	-11.000	0.5533
time	-0.001	<0.0001	4.004	0.0018	0.014	0.7104
EC1	0.051	0.0009	4.748	0.0005	3.201	0.5505

Source: author's calculations based on EUROSTAT data

The VECM model incorporates following terms: constant (const), time variable (time), and error-correction term (EC1). Estimates of parameters for respective equations of VECM system (tab. 1) that relate the permanent change of terms of trade (hpt_ToT) to the Estonian agri-food goods exports / imports ratio (Rat) and GVA (gross value added) of agricultural industry provide evidence in support of considered variables' statistical significance in equation for terms of trade permanent component and in equation for exports / imports ratio. On the other hand, such conclusion is not to be drawn in equation of GVA.

The model estimation was followed by impulse response function (IRF) evaluation. This enabled to assess the model response to system variables' changes. The analysis led to the conclusion that an positive impulse in permanent component of terms of trade causes sharp increase in hpt_ToT and GVA variables in consecutive VECM equations. In relation to Rat variable, a rise in hpt_ToT causes Rat decrease. The stabilisation of the system is attained after two periods. Any positive impulse derived from trade balance (Rat – exports / imports ratio) has an decreasing effect on every system variable. Any increase in GVA stimulates positively remaining VECM system variables (however, the effect is weak).

The final stage of the country's study was the forecast error variance decomposition (FEVD). The outcome of FEVD after ten steps (tab. 2) makes it possible to quantify which shocks are most important to determine consecutive variables. As shown in table 2, in the last period of the prognosis permanent changes in terms of trade (hpt_ToT) accounted for 78.18 % (equation hpt_ToT) of this variable and for 18.16 % of trade balance (Rat equation). Thus, the trade balance (Rat) variability could be explained in the most degree by previous changes in the trade balance. Additionally, the trade balance significantly influences GVA (GVA equation). As the analysis's consequence, one can state that terms of trade is the most exogenous factor within the considered system. On the other hand the most endogenous variable is GVA. So, trade balance is more exogenous than GVA and less exogenous than permanent terms of trade component.

Table 2

The forecast error variance decomposition (last period of prognosis) in the model (VECM) for permanent changes in terms of trade of Estonia

Period	Equation for terms of trade (hpt_ToT)			Equation for exports / imports ratio (Rat)			Equation for GVA (GVA)		
	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA
10	78.18 %	20.78 %	1.02 %	18.16 %	64.09 %	17.75 %	7.90 %	43.29 %	48.81 %

Source: author's calculations based on EUROSTAT data

Cointegration test performed for temporary terms of trade changes revealed No cointegration vector. This suggested application of VAR model for short-run study. However, the VAR model was not effective in any temporary terms of trade changes impact identification on variables under consideration.

2. Terms of trade changes impact on agricultural industry of Lithuania

For permanent terms of trade changes Johansen cointegration test based on trace statistical test ($r \geq 1$ $\lambda_{trace} = 12.530$ $p = 0.2764$) and the maximum eigenvalue test ($r = 1$ $\lambda_{max} = 11.026$ $p = 0.3153$) suggest the presence of a single cointegration vector. This implicates application of the VECM for long-run relationship analysis.

Table 3

Assessment of permanent terms of trade changes effect of agri-food goods for Lithuania (VECM model)

Model term	Equation for terms of trade permanent component		Equation for exports / imports ratio		Equation for GVA	
	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
const	-2.902	0.0018	275.893	0.0301	1.482	0.1642
time	-0.037	<0.0001	-1.437	0.0193	0.983	0.3450
EC1	-0.023	0.0017	-2.193	0.0333	1.510	0.1569

Source: author's calculations based on EUROSTAT data

Analogous to Estonia study, the VECM model performed for Lithuania (tab. 3) and evaluating permanent terms of trade impact supported the claim related statistical significance of lag values of system variables (hpt_ToT, Rat, GVA) in explanation of terms of trade and exports / imports ratio. No model term was significant in GVA equation.

The impulse response function estimated for the above VECM model revealed that changes of VECM system variables trigger immediate response of the variables in the model. The model stabilises after two periods after shock. An positive impulse in permanent terms of trade positively affects terms of trade (hpt_ToT) and GVA of agriculture in Lithuania and negatively influences agri-food trade balance (Rat – exports / imports ratio).

Table 4

The forecast error variance decomposition (last period of prognosis) in the model (VECM) for permanent changes in terms of trade of Lithuania

	Equation for terms of trade (hpt_ToT)			Equation for exports / imports ratio (Rat)			Equation for GVA (GVA)		
Period	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA
10	78.28 %	4.86 %	16.86 %	2.48 %	67.33 %	30.19 %	10.06 %	59.39 %	39.55 %

Source: author's calculations based on EUROSTAT data

Accordingly to the information presented in table 4, in the final year of the prognosis permanent changes in terms of trade (hpt_ToT) accounted for 78.28 % (hpt_ToT equation) of this variable variability and for 2.48 % of trade balance variation (Rat equation). Trade balance (equation Rat) explains 67.33 % it's own variability. In the equation for GVA trade balance significantly impacts on variable GVA (59.39 % of the variance of GVA could be attributed to Rat). So, the forecast error variance decomposition study performed for Lithuania revealed that permanent terms of trade component and trade balance in Lithuanian agri-food industry generally are independent factors. Permanent terms of trade is slightly more exogenous than that variable in model for Estonia. Additionally, trade balance (Rat) relatively significantly affects GVA of agricultural industry in Lithuania.

Table 5

Assessment of temporary terms of trade changes effect of agri-food goods for Lithuania (VAR model)

	Equation for terms of trade temporary component		Equation for trade balance		Equation for GVA	
Model term	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
const	3.819	0.1318	-116.676	0.2981	496.986	0.0004
hp_ToT_1	-0.011	0.9637	-11.883	0.5327	24.751	0.1300
Bal_1	0.006	0.0794	0.592	0.0191	0.626	0.0041
GVA_1	-0.008	0.0852	0.496	0.0890	0.027	0.9093

Source: author's calculations based on EUROSTAT data

Cointegration tests performed for temporary terms of trade changes revealed No cointegration vector (trace statistical test: $r \geq 2$ $\lambda_{trace} = 9.228$ $p = 0.0024$; the maximum eigenvalue test: $r = 2$ $\lambda_{max} = 9.228$ $p = 0.0024$). This suggested application of VAR model for short-run study purposes. The model was built based on following variables: temporary terms of trade (hp_ToT), agri-food trade balance (Bal), and gross value added of agriculture (GVA). The main results of that analysis (tab. 5) may be summarized as identification of an positive impact of trade balance on all model variables. However, this variable is marginally statistically significant in the equation for temporary terms of trade changes. The remaining system variables are not statistically significant.

3. Terms of trade changes impact on agricultural industry of Latvia

For permanent terms of trade changes of Latvian agriculture Johansen cointegration test based on trace statistical test ($r \geq 1$ $\lambda_{trace} = 12.232$ $p = 0.2975$) and the maximum eigenvalue test ($r = 1$ $\lambda_{max} = 12.158$ $p = 0.2332$) implicates the presence of a single cointegration vector. This results suggest application of the VECM for the relationship investigation.

Table 6

Assessment of permanent terms of trade changes effect of agri-food goods for Latvia (VECM model)

Model term	Equation for terms of trade permanent component		Equation for exports / imports ratio		Equation for GVA	
	Coefficient	p - value	Coefficient	p - value	Coefficient	p - value
const	-8.280	0.0010	-346.435	0.0082	300.171	0.7943
time	-0.107	<0.0001	2.144	0.0302	-0.742	0.9354
EC1	0.110	0.0002	3.916	0.0072	-3.335	0.7934

Source: author's calculations based on EUROSTAT data

Results of error-correction model (based on variables: hpt_ToT, Rat, GVA) for Latvia which are presented in the table 6, relates considered variables to permanent terms of trade changes and exports / imports ratio. System variables are not statistically valid in the equation for GVA of agricultural industry.

The impulse response function assessed for Latvia showed that positive impulse in permanent terms of trade (hpt_ToT) causes sharp rise in that variable and a similar effect in agri-food trade balance (Rat). An opposite effect was noted in GVA of agriculture. An impulse in trade balance positively stimulate trade balance and permanent terms of trade.

Table 7

The forecast error variance decomposition (last period of prognosis) in the model (VECM) for permanent changes in terms of trade of Latvia

Period	Equation for terms of trade (hpt_ToT)			Equation for exports / imports ratio (Rat)			Equation for GVA (GVA)		
	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA	hpt_ToT	Rat	GVA
10	73.92 %	14.96 %	11.12 %	10.93 %	33.22 %	55.84 %	8.20 %	29.43 %	62.37 %

Source: author's calculations based on EUROSTAT data

Results of the FEVD analysis shown in table 7 indicate that in the last period of the prognosis permanent changes in terms of trade (hpt_ToT) accounted for 73.92 % of its own variability (hpt_ToT equation) and for 10.93 % variability of trade balance (Rat equation). Hence, trade balance of agri-food goods is influenced more extensively by GVA (55.84 % of explained variability in equation Rat) than through permanent component of terms of trade. Furthermore, the trade balance relates significantly to GVA (29.43 % of explained variability of GVA in GVA equation).

Information presented in table 7 suggest that the impact of permanent terms of trade changes on the trade balance of agri-food goods variability in Latvia is less meaningful than the opposite influence. The FEVD analysis revalidated remarks related to previous models. However, the scope of trade balance exogeneity in Latvian model is lower than in model for Lithuania. This leads to the conclusion that trade balance shocks are not so crucial to determine remaining (considered in the VECM model) variables in Latvian economy. Permanent terms of trade component of Latvian agriculture seems to be to some extent more independent factor than remaining model elements.

For short-run terms of trade changes analysis Johansen cointegration test implied application of VAR model. However, model evaluating the impact in temporary indicator's changes lead to rejection of the statement combining terms of trade shock with trade balance.

Conclusions, proposals, recommendations

The main results of the research may be summarized as follows.

- 1) The terms of trade time series contain temporary and permanent components. In order to split the series development into temporary and permanent categories, the data were transformed by means of Hodrick-Prescott filter.
- 2) The long-run assessment of terms of trade changes is made using vector error correction model (VECM). The short-run estimates of terms of trade fluctuations are based on vector autoregression model (VAR).
- 3) Assessments of permanent changes in terms of trade relate this variable and trade balance changes to terms of trade development, and to trade balance (exports / imports ratio) development.
- 4) On the other hand, long-run impact of GVA (gross value added) of agricultural industry on the other considered variables is not meaningful.
- 5) The research identified an impact of temporary terms of trade shocks on GVA of agricultural industry of Lithuania. The study results did not reveal any statistically significant short-run effect of the terms of trade shocks on trade balance and gross value added in Estonia and Latvia.
- 6) The study revealed that the trade balance of agri-food products has meaningful effect on gross value added of agricultural industry in Lithuania.
- 7) For short-run analysis purposes it is worth to consider shorter time frames and higher frequency data, as these may yield insights into the way the examined variables relate each other.

Bibliography

1. Agenor, P., Aizenman, J. (2000). Savings and the Terms of Trade Under Borrowing Constraints, NBER Working Paper No. 7743, Cambridge, MA, pp. 3-12.
2. Chowdhury, A. (2003). Do asymmetric terms of trade shocks affect private savings in a transition economy? Discussion Papers No. 3, Bank of Finland Institute for Economies in Transition, Helsinki, pp. 1-32.
3. Harberger, A. (1950). Currency Depreciation, Income and the Balance of Trade. *Journal of Political Economy*, 58, pp. 47-60.
4. Hodrick, R., Prescott, E. (1997). Postwar U.S. Business Cycles: An Empirical Investigation. *Journal of Money, Credit and Banking*, 29(1), pp. 1-6.
5. Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics Control*, 12(2-3), pp. 231-254.
6. Kent, Ch., Cashin, P. (2003). The Response of the Current Account to Terms of Trade Shocks: Persistence Matters. IMF Working Paper, No. 143, pp. 13-14.
7. Kusidel, E. (2000). Modele wektorowo-autoregresyjne VAR. *Metodologia i zastosowania (VAR - Vector Autoregressive Models. Methodology and Applications)*. Lodz, Absolwent, pp.14-58.
8. Kwiatkowski, D., Phillips, P., Schmidt, P., Shin, Y. (1992). Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root. *Journal of Econometrics*, 54, pp. 159-178.
9. Laursen, S., Metzler, L. (1950). Flexible Exchange Rates and the Theory of Employment. *Review of Economics and Statistics*, No. 32(4), pp. 281-299.
10. Lutkepohl, H. (1991). *Introduction to Multiple Time Series Analysis*, Springer-Verlag, Berlin-Heidelberg, pp. 1-479.
11. Turnovsky, S. (1997). *International Macroeconomic Dynamics*, MIT Press, Cambridge, pp. 83-86.
12. Wang, P. (2009). *The Economics of Foreign Exchange and Global Finance*. Springer, Berlin, pp. 109-118.

THE ECONOMIC ASSESMENT OF PRODUCTION TECHNOLOGY OF HARD WHEAT DEPENDING ON THE PRODUCTION INTENSITY LEVEL

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Abstract. The aim of the study was to assess the production and economic effects of spring wheat cultivar SMH87 depending on the intensity of production technology. The analysis was based on research conducted in 2013-2014 at the Experimental Station in Osiny belonging to the Institute of Soil Science and Plant Cultivation - State Research Institute in Pulawy. Wheat was grown using the following production technologies: medium-intensive and intensive. The studied technologies differed in the level of mineral fertilization and chemical plant protection against weeds, diseases, and pests. The studies showed a significant influence of the production technology intensity level on durum wheat yielding. Durum wheat cultivated under intensive technology yielded higher than under the average level of agrotechnics. However, a significant increase in grain yield was observed in the harvest year 2014, amounting to 1,07 t·ha⁻¹. The lowest direct costs were incurred with the use of medium-intensive technology, while the highest in intensive technology conditions. The difference in direct costs resulted primarily from the reduction of consumption of mineral fertilizers and reduction of plant protection treatments under the integrated technology compared to the intensive technology. The highest direct surplus from 1 ha of durum wheat cultivation was obtained with the use of intensive technology in 2014 (PLN 3696), which was 18.7 % higher than the average intensive technology. The profitability of durum wheat production in every technology was high. The most favourable direct profitability index was obtained by durum wheat cultivated according to medium-intensive technology.

Key words: durum wheat, production technology, economic assessment, yield.

JEL code: Q10, Q14

Introduction

Durum wheat (*Triticum durum*) is a species cultivated in regions with warm climates and low rainfall (Asia, Middle East, North America, Australia and Africa). Compared to common wheat, grains of durum wheat are characterized by vitreous, hard endosperm with a higher protein content, including gluten proteins, with a higher content of carotenoid dyes and a lighter and thinner fruit and seed coat (Rachon L., at all., 2015). Due to these properties, durum wheat grain reaches a high price and is a sought-after raw material on the international market, mainly for the production of pasta. Interest in durum wheat cultivation is growing not only in traditional regions, but mainly in countries where durum wheat had not been cultivated or had been marginally cultivated, e.g. Hungary, Germany or Poland (Rachon L., Szumilo G., 2002; 2006; Segit Z., Szwed-Urbas K., 2000). Due to the unique technological value of grain and its use in production, it is important to develop a production technology that would ensure its profitability. The profitability of cereal production is determined by grain purchase prices and the level of intensity of production technology, measured by direct costs, which reflect the consumption of means of production. One of the most important factors that determine the effectiveness of a given technology is mineral fertilisation, especially nitrogen fertilisation. This is the main factor influencing wheat yields. Among the factors differentiating the effectiveness of a given cereal production technology, one should mention the costs related to the protection of plants against weed infestation, diseases and insecticides (Jaczewska-Kalicka A., Krasinski, T., 2010). The ultimate goal of any technology to be used in practice is economic evaluation (Krasowicz S., Nowacki W., 2005). Only direct costs can be taken into account in the economic assessment, based on an incomplete, simplified calculation (Harasim A., 2007; Krasowicz S., 1999). The consequence of limiting the assessment to the direct costs is to calculate the direct surplus as the difference between the value of the grain harvested per hectare and the direct costs of the industrial means of production.

¹ Contacts to be added to the author, as a footnote at the bottom of the first page (6 point Verdana font)

The analysis was based on research conducted in 2013-2014 at the Experimental Station in Osiny belonging to the Institute of Soil Science and Plant Cultivation - State Research Institute in Pulawy. Spring wheat (*Triticum durum*) SMH87 cultivar was cultivated in a long-term experiment with the share of 75 % of cereals in crop rotation, using production technologies: medium-intensive and intensive. The studied technologies differed in terms of the level of mineral and chemical fertilization of plant protection against weeds, diseases, pests, and deforestation (Table 1). Wheat was cultivated on plots of 51 m². In the evaluation of economic efficiency, indicators were calculated for 1 ha.

Table 1

Characterization of the applied technologies for spring wheat

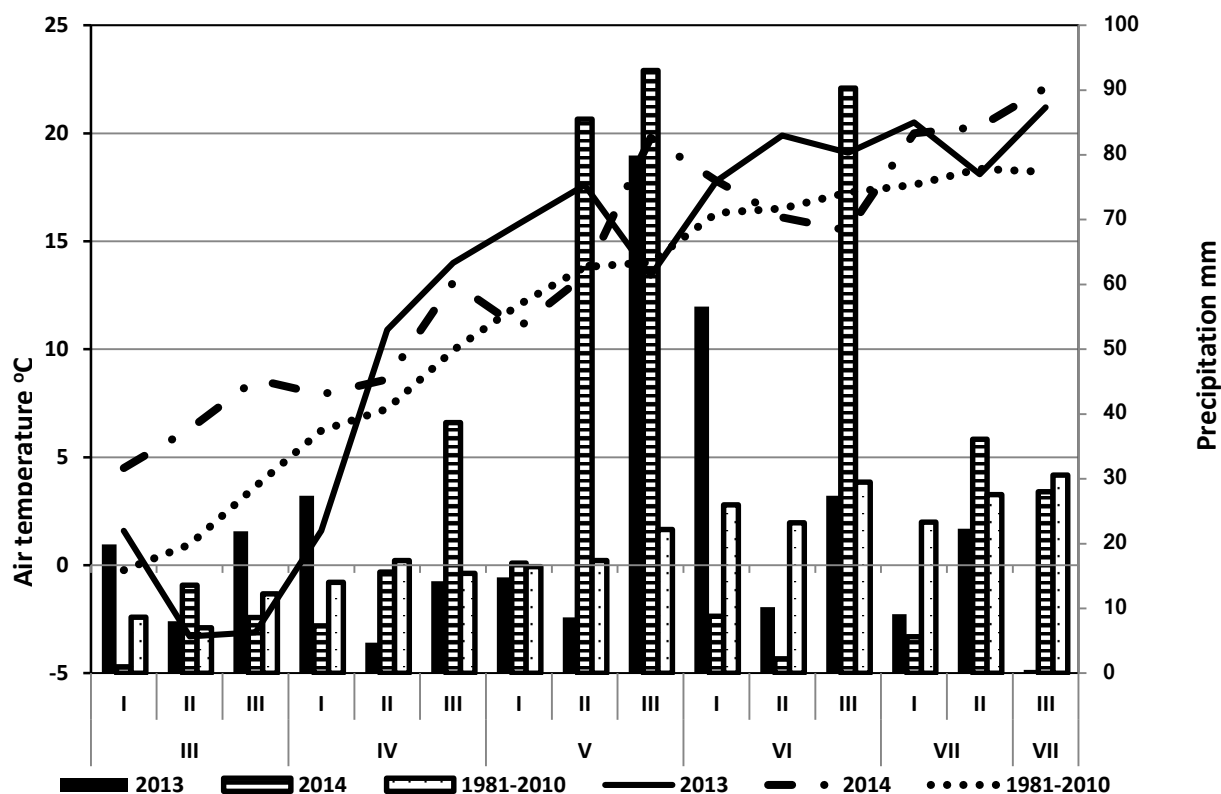
Specification	Technologies	
	Medium-intensive	Intensive
Previous crop	winter rape	
Fertilization (kg·ha⁻¹) N (ammonium nitrate)	50 (in spring before sowing) 40 (at BBCH 31) 10 (at BBCH 51)	60 (in spring before sowing) 60 (at BBCH 31) 35 (at BBCH 51)
P (superphosphate) K (potassium salt)	70 P ₂ O ₅ 105 K ₂ O	80 P ₂ O ₅ 120 K ₂ O
Herbicide	At BBCH 31: florasulan, aminopyralid 2.4 (0.8 l·ha ⁻¹)	At BBCH 31: florasulan, aminopyralid 2.4 (0.8 l·ha ⁻¹)
Fungicide	At BBCH 57: azoksystrobin (0.6 l·ha ⁻¹)	At BBCH 41: protiokonazol, spiroksamin (1.0 l·ha ⁻¹) BBCH 57: azoksystrobin + propikonazol cyprokonazol (0.6 l·ha ⁻¹ + 0.4 l·ha ⁻¹)
Growth regulator	-	At BBCH 31: trineksapak etylu (0.4 l·ha ⁻¹)
Insecticide	At BBCH 51: zeta- cypermetryn (0.1 l·ha ⁻¹)	At BBCH 51: zeta- cypermetryn (0.1 l·ha ⁻¹)

(Own study)

The amount of inputs was established on the basis of the actual use of fertilisers, seeds, and plant protection products in the experiment. The costs of means of production were determined on the basis of purchase prices, and the value of winter wheat production was determined according to the average grain purchase price in 2018 (IERiGZ-PIB, 2018). In grain production calculations, the sale price of PLN 1245 per 1 t of pasta wheat grain in the fourth quarter of 2018, was assumed. In order to evaluate the studied durum wheat production technologies, the Gross Margin category was used. The direct surplus from the activity (in this case of durum wheat cultivation) according to the methodology of the European Union (EU), is the annual production value obtained from 1 ha of cultivation, lowered by the direct costs incurred to generate this production (Nowak A., et al., 2013). The final stage of the economic calculation was the calculation of the direct profitability index as the ratio of production value to direct costs. For each technology, the size of production balancing the direct costs expressed in terms of grain necessary to cover these costs, was calculated. The analysis of profitability was incomplete as the category of direct surplus did not take into account indirect costs incurred during the production process.

Average air temperatures and total precipitation during the study period were prepared on the basis of data recorded at a meteorological station in Osiny. Meteorological conditions in 2013 and 2014 are shown in Figure 1.

Analyses of weather conditions in the wheat growing season, showed that 2013 was characterized by a lower amount of precipitation from April to July (327.4 mm) compared to 2014 (428 mm). Total precipitation was higher by 85 and 186 mm, respectively, as compared to the long-term average. The year of 2013 was exceptionally warm and moderately humid, while 2014 can be described as very wet with a moderate temperature from April to June. In this year, high air temperatures occurred in July during the ripening period of the grain.



(Oun study)

Fig. 1. Meteorological conditions in 2013 and 2014 compared to the long-term average of 1981-2010

The aim of the study was to assess the production and economic effects of spring wheat cultivar SMH87 depending on the intensity of production technology.

The results were statistically analysed using a one-way ANOVA, using the Statgraphics Centurion XVI computer program. Significance of differences between means were evaluated using the Tukey test at the level of significance $p=0.05$.

Research results and discussion

Spring durum wheat was cultivated using two production technologies, differing in mineral fertilisation and the use of chemical plant protection agents. The range of differences between production technologies is presented in Tables 1 - 2. In direct costs, mineral fertilizers and plant protection products accounted for 60.0 % in medium-intensive technology, and 70.0 % in intensive technology (Table 3). The share of seed costs in the medium-intensive technology was 39.9 %, while in the intensive technology 30. %. Differences in the level of direct outlays determined the profitability of durum wheat production. Mineral fertilisation is the most energy-consuming and cost-consuming element of agro-technology and may exceed even 60 % of outlays incurred in cereal production (Dropka D., 2004). The influence of production technology intensity on spring wheat yield depended on the year of research (Table 2). In 2013 No significant influence on durum wheat yield was found. On the other hand, in 2014 durum wheat obtained a significantly higher yield level when cultivated under intensive technology. The increase in grain yield was $1.07 \text{ t} \cdot \text{ha}^{-1}$ in relation

to the yield obtained under medium-intensive technology. Rachon L., et al., (2014) and Panasiewicz K., et al., (2011). They also found that durum wheat responds with a significant increase in grain yield to a higher level of agrotechnology. Jarecki W., et al. (2013) obtained a higher level of durum wheat yield after the application of 150 t·ha⁻¹ in the uptake up to 90 N·ha⁻¹. Sulek A., Podolska G., (2012) showed that spring wheat cultivated according to intensive technology yielded 15.6 % higher in comparison to the integrated technology.

The effectiveness of mineral fertilization depended on the applied production technology. Wheat grain production per 1 kg of nitrogen applied in mineral fertilizers, was higher under medium-intensive than under intensive technology. Taking into account all fertiliser components, the differences between medium-intensive and intensive technology in terms of productivity of 1 kg NPK amounted to 8.2 % (Table 4).

The direct surplus, which is the difference between the value of grain yield and direct costs calculated for individual production technologies, showed significant differences. A comparison of the data in Table 4 shows that higher direct costs were incurred using intensive technology. The difference in direct costs resulted primarily from the reduction of mineral fertilizers and reduction of plant protection treatments in the medium-intensity technology compared to those applied in the intensive technology. The highest direct surplus from 1 ha of durum wheat cultivation was obtained in 2014 using intensive technology (3696 PLN). It was 18.8 % higher than the average intensive technology.

In 2013, the intensity of production technology did not differentiate this indicator. In other studies concerning winter wheat, a higher direct surplus from 1 ha of cultivation using intensive technology (PLN 3679) was found, which was 16.0 % higher than that obtained in the integrated technology and 8.8 % higher in the economical one (Sulek A., et al., 2016). On the other hand, the research by Nierobca P., et al., (2008) showed that the level of cereal yields was not proportional to the level of direct surplus. The highest direct surplus was obtained by these researchers with the use of medium-intensive and economical technology, and the lowest in the intensive technology conditions. An important measure of technology evaluation is the profitability of production, which is the relation of production value to direct costs. The profitability of spring wheat production in comparable technologies was high. In our research, the highest value of this indicator was achieved in medium-intensive technology (270 %) (Table 4). Szmigiel A., et al. (2006) also achieved the highest profitability of wheat production in low-cost technology without the use of chemical plant protection. Research conducted by Grabinski J., (2015) indicates that the profitability of the technology of lower intensity (with lower use of mineral fertilizers) was higher in relation to the technology obtained in intensive technology, despite similar wheat yields under both technologies.

Table 2

The cost of seeds, mineral fertilizers and plant protection agents (prices as at 2018)

Production technology	Seeds		Mineral fertilizers		Plant protection agents	
	PLN·ha ⁻¹	% of direct cost	PLN·ha ⁻¹	% of direct cost	PLN·ha ⁻¹	% of direct cost
Medium-intensive	770	39.9	936	48.5	221	11.5
Intensive	770	30.0	1275	49.7	521	20.3

(Oun study)

Table 3

Grain yields ($\text{t}\cdot\text{ha}^{-1}$) of durum wheat SMH87 depending on the production technology in 2013 and 2014.

Production technology	Years	
	2013	2014
Medium-intensive	4.18	3.96
Intensive	4.64	5.03
LSD _{0.05}	n.s.	0.825

n.s. – not significant differences
 (Own study)

Table 4

Yields and chosen and indicators of economic efficiency of durum wheat SMH87 production

Specification	Production technology			
	Years			
	2013		2014	
	Medium-intensive	Intensive	Medium-intensive	Intensive
Yield of grain [$\text{t}\cdot\text{ha}^{-1}$]	4.18	4.64	3.96	5.03
Productivity of N [$\text{kg grain}\cdot\text{kg}^{-1}\text{ N}$]	38.0	29.9	36.0	32.4
Productivity of NPK [$\text{kg grain}\cdot\text{kg}^{-1}\text{ NPK}$]	14.7	13.1	13.9	14.7
The value of production [$\text{PLN}\cdot\text{ha}^{-1}$]	5204	5776	4930	6262
Direct costs [$\text{PLN}\cdot\text{ha}^{-1}$]	1927	2566	1927	2566
Direct surplus without direct payment [$\text{PLN}\cdot\text{ha}^{-1}$]	3277	3210	3003	3696
Crop balancing direct costs [t]	1.58	2.06	1.55	2.06
Indicator of direct profitability without direct payment [%]	270	225	255	244

(Own study)

Conclusions

- 1) The intensity of the technology applied had an impact on the production and economic effects of spring durum wheat cultivation. Durum wheat cultivated under intensive technology yielded higher than under the average level of agrotechnics. A significant increase in grain yield was observed in the harvest year 2014, amounting to $1.07 \text{ t}\cdot\text{ha}^{-1}$.
- 2) The level of technology intensity of input costs determined the direct cost structure. Medium-intensive technology without growth retardant, with limited fungicide protection, and a low level of mineral fertilisation turned out to be cheaper.
- 3) Comparable technologies ensured profitability of durum wheat grain production. The most favourable profitability index was recorded for intensive technology in 2014.

Bibliography

1. Dropka, D. (2004). Efektywnosc energetyczna zroznicowanej uprawy przedsiewnej na przykladzie pszenzyta ozimego (Energy efficiency of different pre-sowing cultivation on the example of winter triticale), Annales UMCS, Sec. E, 59(4), pp. 2071-2077.
2. Grabinski, J. (2015). Efekty produkcyjne i ekonomiczne intensywnej i integrowanej technologii produkcji pszenicy ozimej i jeczmienia jarego (Productive and economical effects of intensive and integrated technology production of winter wheat and spring barley). Roczniki Naukowe, XVII, pp. 95-99.
3. Harasim, A. (2007). (red) Wybrane elementy technologii produkcji roslinnej. Kształtowanie srodowiska rolniczego Polski oraz zrownowazony rozwoj produkcji rolniczej (Selected elements of plant production technology. Shaping the Polish agricultural environment and sustainable development of agricultural production). Studia i Raporty IUNG - PIB Pulawy, 7.
4. IERiGZ-PIB. (2018). Rynek rolny. Analizy. Tendencje. Oceny. (Agricultural market. Analysis. Trends. Assessment). Warszawa, IERiGZ-PIB.
5. Jaczewska-Kalicka, A., Krasinski, T. (2010). Czynniki wpływające na wzrost konkurencyjności w produkcji zbóż. Roczniki Naukowe, 10(4), pp. 130-133.

6. Jarecki, W., Buczek, J., Bobrecka-Jamro, D. (2013). Wpływ nawożenia azotem na wielkość plonu ziarna pszenicy twardej (*Triticum durum* Desf.) (Influence of nitrogen fertilization on yield of durum wheat (*Triticum durum* Desf.)). *Fragmenta Agronomica*, 30(2), pp. 68-75.
7. Krasowicz S. (1999). Ekonomiczna ocena plodozmianów zbóżowych w różnych warunkach polowych. (Economic assessment of cereal crop rotations in different field conditions). *Roczniki Nauk Rolniczych*, 88(1), pp. 117-126.
8. Krasowicz, S. (2009). Możliwości rozwoju różnych systemów rolniczych w Polsce (The possibilities for development of different agricultural systems in Poland). *Roczniki Nauk Rolniczych*, G, 96, 4, pp. 110-121.
9. Krasowicz, S., Nowacki, W. (2005). Wpływ intensywności produkcji na efektywność technologii produkcji roślinnej (The impact of production intensity on the efficiency of plant production technologies). *Pamiętnik Puławski*, 140, pp. 80-102.
10. Nierobca, P., Grabinski, J., Szeleznia, E. (2008). Wpływ intensywności technologii uprawy zbóż w plodozmianie zbożowym na efektywność produkcyjną i ekonomiczną (The influence of the intensity of cereal cultivation technology in crop rotation on production and economic efficiency). *Acta Scientiarum Polonorum, Agricultura*, 7, 3, pp. 71-80.
11. Nowak, A., Haliniarz, M., Kwiatkowski, C. (2013). Aspekty ekonomiczne wybranych technologii produkcji pszenicy jarej (Economic aspects of selected production technology of spring wheat cultivation). *Roczniki Naukowe*, XVI, 2, pp. 200-205.
12. Panasiewicz, K., Kozłara, W., Sulewska, H. (2011). Produktowność azotu w uprawie pszenicy twardej jarej (*Triticum durum* Desf.) (Productivity of nitrogen fertilization on spring triticum durum (*Triticum durum* Desf.)). *Nauka Przyroda Technologie*, 5(2), pp. 1-7.
13. Rachon, L., Szumilo, G. (2002). Plonowanie i jakość niektórych polskich i zagranicznych odmian linii pszenicy twardej (*Triticum durum* Desf.). (Yield and grain quality of some Polish and foreign varieties and lines of hard wheat (*Triticum durum* Desf.)). *Pamiętnik Puławski*, 130, pp. 77-86.
14. Rachon, L., Szumilo, G. (2006). Plonowanie a opłacalność uprawy pszenicy twardej (*Triticum durum* Desf.) (Yielding and profitability of hard wheat (*Triticum durum* Desf.)). *Pamiętnik Puławski*, 142, pp. 404-409.
15. Rachon, L., Szumilo, G., Brodowska, M., Woźniak, A. (2015). Nutritional value and mineral composition of grain of selected wheat species depending on the intensity of a production technology. *Journal of Elementology*, 20(3), pp. 705-715.
16. Rachon, L., Szumilo, G., Machaj, H. (2014). Wpływ intensywności technologii uprawy na plonownie różnych genotypów pszenicy ozimej (Influence of intensity cultivars technology on the yield on different genotype of winter wheat). *Annales Universitatis*, LXIX (3), pp. 32-41.
17. Segit, Z., Szwed-Urbas, K. (2008). Zróżnicowanie genetyczne cech użytkowych pszenicy twardej (Genetic differentiation of some utility traits of spring durum wheat). *Biuletyn IHAR*, 250, pp. 117-124.
18. Sulek, A., Podolska, G. (2012). Wpływ integrowanej technologii produkcji na plonowanie pszenicy jarej (The influence of production technology on yielding of spring wheat cultivars). *Progress in plant Protection. Postępy w Ochronie Roslin*. 52(4), pp. 945-950.
19. Sulek, A., Nierobca, P., Podolska, G. (2016). Ocena ekonomiczna technologii produkcji pszenicy ozimej o różnym poziomie intensywności (Economic evaluation of winter wheat production technology with different intensity levels). *Roczniki Naukowe*, XVIII, 2, pp. 256-260.
20. Szmigiel, A., Oleksy, A., Kołodziejczyk, M. 2006. „Porównanie opłacalności różnych grup użytkowych pszenicy ozimej w zależności od poziomu agrotechniki” (Comparison of profitability of grain production of different utilization groups of winter wheat in dependence on agricultural production technology). *Pamiętnik Puławski*, 142, pp. 525-535.

THE ECONOMIC ASSESMENT OF PRODUCTION TECHNOLOGY OF WINTER RYE WITH DIFFERENT INTENSITY LEVEL

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Abstract. The aim of the research was an evaluation of production and economic effects of cultivation of two winter rye cultivars, depending on the applied technology. The paper was based on the results of a field experiment carried out in 2013/2014 and 2014/2015 in the Kępa Agricultural Experimental Station, belonging to the Institute of Soil Science and Plant Cultivation - State Research Institute in Pulawy (Poland). The cultivars tested are: Dankowskie Diament - population cultivar and Palazzo - hybrid cultivar. Rye cultivars were grown under two technologies: intensive and integrated technologies, which differed in terms of the degree of consumption of the means of production. The studies showed a significant influence of the production technology intensity on the yields of winter rye cultivars. In comparison with integrated technology, rye cultivation according to intensive technology, resulted in an increase of grain yields for hybrid cultivar Palazzo by 0.97 t·ha⁻¹, and for population cultivar Dankowskie Diament by 1.26 t·ha⁻¹. This increase of yield resulted from a decrease in direct expenditures related to the use of mineral fertilizers and chemical plant protection agents. Studies have shown that the level of technology intensity calculated by input costs, determined the structure of direct costs and cost-effectiveness of production. Comparable technologies have ensured the profitability of winter rye grain production. The hybrid cultivar Palazzo grown according to the integrated technology, was the most advantageous indicator of direct profitability.

Key words: winter rye, production technology, economic assessment, yield.

JEL code: Q10, Q14

Introduction

Production technology determines the size and quality of agricultural produce (Nowak A., et al., 2013). The final confirmation of the usefulness of a given technology for practical use is its economic evaluation (Harasim A., 2007; Krasowicz S., Nowacki W., 2005). For this purpose, of particular usefulness are calculations that unambiguously indicate that the effectiveness of cereal cultivation depends primarily on the volume of obtained yields, purchase prices and the level of production intensity (Dropka D., 2004; Nasalski et al., 2004). In recent years, issues related to environmental effects have become increasingly important in the development of production technology, which is why intensive technologies, typical especially for farms producing large quantities of grain for sale, have been criticised (Krasowicz S., 2009). An alternative to such technologies is currently considered to be integrated technologies, in which the whole agrotechnology is skilfully connected with a limited consumption of industrial means of production, resulting in an increase in the effectiveness of expenditures incurred and minimizing the negative impact of agriculture on the natural environment (Kus et al., 2007; Podolska G., Sulek A., 2012). In integrated production, the use of pesticides is reduced to the minimum necessary, and mineral fertiliser rates are determined on the basis of soil nutrient abundance and plant nutrition status assessment (Korbas M., Mrowczyński M., 2009). For agricultural producers who produce cereals for the market, the choice of a given technology plays a decisive role in shaping the profitability of farms, as this group of plants usually occupies more than 70 % of the sown area on farms (Nierobca P., et al., 2008).

The research was conducted in two growing seasons 2013/2014 and 2014/2015 in the Agricultural Experimental Station „Kępa” (51°47'49" N, 22°05'32" E) belonging to the Institute of Soil Science and Plant Cultivation - State Research Institute. The experiment was located on pseudobacterial soil, classified as the good wheat complex. They were carried out by means of random blocks in three replications, winter rye being the experimental plant. The first research factor were production technologies of different intensity:

¹ Contacts to be added to the author, as a footnote at the bottom of the first page (6 point Verdana font)

A - integrated, B - intensive. The second factor were rye cultivars: 1) Dankowskie Diament – a population cultivar, 2) Palazzo – a hybrid cultivar.

The amount of inputs was established on the basis of the actual use of fertilisers, seeds, and plant protection products in the experiment. The costs of the means of production were determined on the basis of purchase prices and the value of winter rye production was determined on the basis of the average purchase price of grain in 2018 (IRGiGZ-PIB, 2018). In the grain production calculations, the selling price of PLN 680 per 1 t of consumer rye grains, was assumed. Only direct costs were taken into account in the economic assessment of the production technology, and the direct surplus was calculated as the difference between the value of the production output and the direct costs incurred. The final stage of the economic calculation was the calculation of the direct profitability index as the ratio of production value to direct costs. For each production technology, balancing the direct costs expressed in terms of grains necessary to cover these costs, has also been calculated.

The aim of this study was to evaluate the production and economic effects of cultivation of two winter rye cultivars depending on the production technology applied.

The results were statistically analysed using a one-way ANOVA, using the Statgraphics Centurion XVI computer program. Significance of differences between means were evaluated using the Tukey test at the level of significance $p=0.05$.

Research results and discussion

Winter rye was cultivated using two production technologies, differing in mineral fertilization and chemical plant protection agents' consumption. The range of differences between production technologies is presented in Tables 1-2. In direct costs, mineral fertilizers in intensive technology accounted for 54.6 - 62.2 %, while in integrated technology 53.8 - 63.9 % (Tab. 3). The share of seed costs ranged from 11.1 - 21.9 % in intensive technology to 15.1-28.5 % in integrated technology. Differences in the level of direct inputs determined the profitability of winter rye production. According to literature, mineral fertilisation is the most energy-intensive and cost-intensive element of agro-technology and may exceed even 60 % of the outlays incurred in cereal production (Dropka D., 2004).

Table 1

Mean of seeds and fertilizers applied in particular technologies of winter rye

Production technology	Cultivar	Seeds kg·ha ⁻¹	Fertilization kg·ha ⁻¹		
			N	P ₂ O ₅	K ₂ O
Integrated	Dankowskie Diament	102	82	60	90
	Palazzo	78	82	60	90
Intensive	Dankowskie Diament	102	124	70	110
	Palazzo	78	124	70	110

(own study)

Table 2

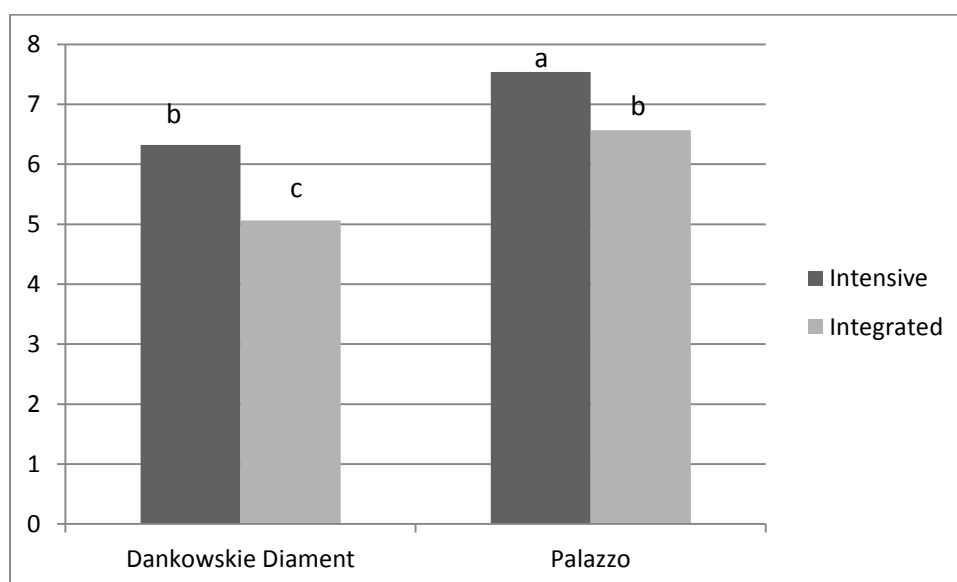
Consumption of plant protection products in particular technologies of winter rye

Production technology	Herbicides	Fungicides	Retardants	Insecticides
Integrated	Alistar Grande 1.0 l·ha ⁻¹	Falcon 460EC 0.6 l·ha ⁻¹	-	Fury 100 EW 0.1 l·ha ⁻¹
Intensive	Alistar Grande 1.0 l·ha ⁻¹	Saligor 425EC 0.8 l·ha ⁻¹ Falcon 460EC 0.6 l·ha ⁻¹	Moddus 250EC 0,3 l·ha ⁻¹	Fury 100 EW 0.1 l·ha ⁻¹

(own study)

Winter rye, regardless of cultivar, produced significantly higher grain yield under intensive production technology (Fig. 1). Comparing the studied cultivars, it should be stated that a higher grain yield was obtained for the hybrid cultivar - Palazzo. In the case of Dankowskie Diament, the increase in grain yield was 1.26 t·ha⁻¹, while in the case of Palazzo 0.97 t·ha⁻¹, as compared to that obtained in the integrated technology (Tab. 4). Hybrid cultivars of rye have a high yield potential and a higher tillage area in comparison to population rye (Haffke S., et al., 2014; Piechota T., et al., 2017). They also are highly resistant to disease and make effective use of minerals (Miedaner T., et al., 2012).

The increase in the yields of both cultivars resulted from increased outlays on mineral fertilizers and plant protection products. Other research results (Nierobca P., et al., 2008) also indicate that under intensive technology conditions cereal grain yields (triticale) were the highest. According to Jaskiewicz's B. research (2015; 2017), intensive technology also results in higher grain yields. In the study by Jaskiewicz B. and Sulek A. (2018), the lower yield of triticale grain in the economical technology resulted from lower direct outlays related to the use of seeds, mineral fertilizers and chemical plant protection agents. Studies conducted with winter wheat (Sulek A., et al., 2016) indicate that under the conditions of intensive technology of grain production, grain yields were higher by 13 % and 18 %, respectively, compared to those obtained in the integrated and economical technology.



(own study)

a, b, c mean value followed by the letters differ significantly at $p = 0.05$

Fig. 1 Grain yields (t·ha⁻¹) of winter rye depending on the production technology (average from 2014 and 2015).

Table 3

**The cost of seeds, mineral fertilizers and plant protection agents
 (prices as in 2018)**

Production technology	Cultivar	Seeds		Mineral fertilizers NPK		Plant protection agents	
		PLN ·ha ⁻¹	% of direct cost	PLN ·ha ⁻¹	% of direct cost	PLN ·ha ⁻¹	% of direct cost
Intensive	Dankowskie Diament	187	11.1	1048	62.2	451	26.7
	Palazzo	420	21.9	1048	54.6	451	23.5
Integrated	Dankowskie Diament	187	15.1	793	63.9	261	21.0
	Palazzo	420	28.5	793	53.8	261	17.7

(own study)

The effectiveness of mineral fertilization depended on the applied production technology. Productivity expressed in kg of rye grain converted into 1 kg of nitrogen applied in mineral fertilizers (on average for cultivars) was higher under integrated technology conditions (Tab. 4). When all fertiliser components are taken into account, the difference between intensive and integrated technology in terms of productivity of 1 kg NPK was 27 %. The direct surplus being the difference between the value of yield and direct production costs calculated for particular production technologies showed significant differences (Tab. 4). The lowest direct costs were incurred under integrated technology with cultivar Dankowskie Diament, while the highest under the intensive technology with the hybrid cultivar Palazzo. The difference in direct costs between production technologies, resulted primarily from a reduction of rates of mineral fertilizers and reduction of plant protection treatments under the integrated technology in comparison to those used intensive technology. The highest direct surplus from 1 ha of winter rye cultivation was obtained under intensive technology. In the cultivation of the Palazzo cultivar, it amounted to PLN 3209, and in the case of the Dankowskie Diament cultivar - PLN 2612. Compared to the integrated technology, these surpluses were higher by 9.3 and 8.4 %, respectively. The economic evaluation carried out for other cereal species (Sulek A., 2017; Jaskiewicz B., Sulek A., 2018) also indicates that the highest direct surplus per 1 ha was obtained by growing wheat and triticale under intensive technology. In research of Nierobca P., et al. (2008), the level of the direct surplus was not proportional to the level of yields of winter triticale. The biggest direct surplus was obtained by using economical technology, while the smallest by using intensive production technology. The reason for such a situation was high grain yields obtained in the economical technology with low consumption of means of production, while the increase in grain yield in the intensive technology did not compensate for the increase in the expenditures incurred. Our research indicates that the value of harvested grain significantly exceeded the direct costs of its production (Tab. 4). In intensive technology, more grains (2.6 t) than economical grains (2.0 t) had to be used to cover direct costs.

An important element of technology assessment is the cost-effectiveness of production, which is the relation between the value of production and direct costs. High profitability of winter rye production in both technologies and for both cultivars was obtained in our own research. The hybrid cultivar Palazzo was characterized by higher profitability of production in comparison to the population cultivar Dankowskie Diament. In other studies (Podolska G., et al., 1996), the highest profitability of wheat production was obtained in low-input technology without the use of chemical plant protection. Grabinski J., et al. (2015) indicate that the cost-effectiveness of integrated technology is higher than in intensive technology, despite similar wheat yields.

Table 4

Yields and chosen and indicators of economic efficiency of winter rye cultivars production

Specification	Production technology			
	Integrated		Intensive	
	Cultivar			
	Dankowskie Diament	Palazzo	Dankowskie Diament	Palazzo
Yield of grain [t·ha ⁻¹]	5.06	6.57	6.32	7.54
Productivity of N [kg grain · kg ⁻¹ N]	61.7	80.1	51.0	60.8
Productivity of NPK [kg grain · kg ⁻¹ NPK]	21.6	28.3	20.8	24.8
The value of production [PLN · ha ⁻¹]	3441	4468	4298	5127
Direct costs [PLN · ha ⁻¹]	1241	1474	1686	1919
Direct surplus without direct payment [PLN · ha ⁻¹]	2200	2994	2612	3209
Crop balancing direct costs [t]	1.8	2.2	2.5	2.8
Indicator of direct profitability without direct payment [%]	277	303	255	267

(own study)

Conclusions, proposals, recommendations

- 1) Winter rye cultivation under intensive technology, in comparison with the integrated technology, caused an increase in grain yield for the hybrid cultivar Palazzo by 0.97 t·ha⁻¹, and for the population cultivar Dankowskie Diament by 1.26 t·ha⁻¹.
- 2) The level of technology intensity determined by expenditures on means of production determined the structure of direct costs, in which mineral fertilisers accounted for the largest share, amounting to in intensive technology 54.6 - 62.2 %, while in integrated technology 53.8 - 63.9 %.
- 3) Integrated technology without growth retardant and with limited fungicide protection and low level of mineral fertilization turned out to be more cost-effective, and at the same time more profitable than the intensive technology. The indicator of direct profitability without direct payment was higher in integrated technology (277-303 %) compared to intensive technology (255-267 %).
- 4) The hybrid cultivar Palazzo grown according to the integrated technology was characterized by the most advantageous indicator of direct profitability.

Bibliography

1. Dropka, D. (2004). Efektywnosc energetyczna zroznicowanej uprawy przedsiewnej na przykladzie pszenzyta ozimego (Energy efficiency of different pre-sowing cultivation on the example of winter triticale). Annales UMCS, Secon E, 59, 4, pp. 2071-2077.
2. Grabinski, J. (2015). Efekty produkcyjne i ekonomiczne intensywnej i integrowanej technologii produkcji pszenicy ozimej i jeczmenia jarego (Productive and economical effects of intensive and integrated technology production of winter wheat and spring barley). Roczniki Naukowe, XVII, pp. 95-99.
3. Hafke, S., Kusterer, B., Fromme, F.J., Roux, S., Hackauf, B., Miedaner, T. (2014). Analysis of covariation of grain yield and dry matter yield for breeding dual use hybrid rye. Bioenergy Research, 7, pp. 424-429.
4. Harasim, A. (2007). (red) Wybrane elementy technologii produkcji roslinnej. (Selected elements of plant production technology. Studia i Raporty IUNG - PIB, 9, 218 pp.
5. IERiGZ-PIB. (2018). Rynek rolny. Analizy. Tendencje. Oceny. (Agricultural market. Analysis. Trends. Assessment). IGRiGZ-PIB, Warszawa
6. Jaskiewicz, B. (2015). Wplyw technologii produkcji na plonowanie pszenzyta ozimego w warunkach roznego udzialu zbosz w strukturze zasiewow (The influence of production technology on the yield of winter triticale in the conditions of different cereal share in the sowing structure). Polisch Journal of Agronomy, 23, pp. 11-17.
7. Jaskiewicz, B. (2017). Wplyw technologii produkcji na plonowanie pszenzyta jarego w warunkach roznego udzialu zbosz w strukturze zasiewow (The influence of production technology on the yield of spring triticale in the conditions of different cereal share in the sowing structure). Fragm. Agronom., 34, 2, pp. 7-17.
8. Jaskiewicz, B., Sulek, A. (2018). Ocena ekonomiczna technologii produkcji pszenzyta ozimego o roznym poziomie intensywnosci (Economic evaluation of production technology of winter triticale with different intensity levels). Roczniki Naukowe SERIA, XX, 5, pp. 69-73.
9. Korbas, M., Mrowczynski, M. (2009). Integrowana produkcja pszenicy ozimej i jarej (Integrated production of winter and spring wheat). IOR-PIB, Poznan, 166 pp.

10. Krasowicz, S. (2009). Możliwości rozwoju różnych systemów rolniczych w Polsce (The possibilities for development of different agricultural systems in Poland). *Roczniki Nauk Rolniczych*, G, 96, 4, pp. 110-121.
11. Krasowicz, S., Nowacki, W. (2005). Wpływ intensywności produkcji na efektywność technologii produkcji roślinnej (The impact of production intensity on the efficiency of plant production technologies). *Pam. Pul.*, 140, pp. 80-102.
12. Kus, J., Jonczyk, K., Kawalec, A. (2007). Czynniki ograniczające plonowanie pszenicy ozimej w różnych systemach gospodarowania (Factors limiting the yield of winter wheat in different management systems). *Acta Agrophysica*, 10, 2, pp. 407-417.
13. Miedaner, T., Koch, S., Seegl, A., Schmiedchen, B., Wide, P. (2012). Quantitative genetic parameters for selection of biomass yield in hybrid rye. *Plant Breeding*, 131(1), pp. 100-103.
14. Nierobca, P., Grabinski, J., Szeleznia, E. (2008). Wpływ intensywności technologii uprawy zbóż w plodozmianie zbożowym na efektywność produkcyjną i ekonomiczną (The influence of the intensity of cereal cultivation technology in crop rotation on production and economic efficiency). *Acta Scientiarum Polonorum, Agricultura*, 7, 3, pp. 71-80.
15. Nowak, A., Haliniarz, M., Kwiatkowski, C. (2013). Aspekty ekonomiczne wybranych technologii produkcji pszenicy jarej (Economical aspects of selected production technology of spring wheat cultivation). *Roczniki Naukowe SERiA*, XVI, 2, pp. 200-205.
16. Piechota, T., Sawinska, Z., Kowalski, M., Majchrzak, L., Switek, S., Dopierala, A. (2017). Plonowanie i zdrowotność wybranych odmian żyta ozimego uprawianego z przeznaczeniem na biogaz. *Fragmenta Agronomica*. 34(12), pp. 67-74.
17. Podolska, G., Kukula, S., Pawłowska, J., Krasowicz, S., Niesior, E. (1996). Ocena technologii uprawy pszenicy ozimej o różnym poziomie nakładów (Evaluation of winter wheat cultivation technology with different levels of inputs). *Pam. Pul.* 107, pp. 16-26.
18. Podolska, G., Sulek, A. (2012). Wpływ intensywności uprawy na plon i cechy struktury plonu odmian pszenicy ozimej (The influence of cultivation intensity on yield and yield structure of winter wheat cultivars). *Polish Journal of Agronomy*, 11, pp. 41-46.
19. Sulek, A. (2017). Ocena ekonomiczna produkcji pszenicy ozimej z różnych grup użytkowych w zależności od intensywności technologii (Economic evaluation of winter wheat production from various utility groups depending on the intensity of technology). *Roczniki Naukowe SERiA*, XIX, 2, pp. 226-231.
20. Sulek, A., Nierobca, P., Podolska, G. (2016). Ocena ekonomiczna technologii produkcji pszenicy ozimej o różnym poziomie intensywności (Economic evaluation of winter wheat production technology with different intensity levels). *Roczniki Naukowe SERiA*, XVIII, 2, pp. 256-260.