Belgeo

Revue belge de géographie

4 | 2016

Sustainability of rural systems: balancing heritage and innovation

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Roman Rudnicki, Anna Dubownik and Mirosław Biczkowski

Electronic version

URL: <http://journals.openedition.org/belgeo/19722>

DOI: 10.4000/belgeo.19722

ISSN: 2294-9135

Publisher:

National Committee of Geography of Belgium, Société Royale Belge de Géographie

Electronic reference

Roman Rudnicki, Anna Dubownik and Mirosław Biczkowski, « Diversification of sources of income in agricultural holdings in the context of multi-functional development of rural areas in Poland », *Belgeo* [Online], 4 | 2016, Online since 30 December 2016, connection on 30 April 2019. URL : <http://journals.openedition.org/belgeo/19722> ; DOI : 10.4000/belgeo.19722

This text was automatically generated on 30 April 2019.

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Diversification of sources of income in agricultural holdings in the context of multi-functional development of rural areas in Poland

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AUTHOR'S NOTE

This paper was written in the framework of the research project: DEC-2012/07/B/HS4/00364 "The impact of the financial instruments of the European Union on the socio-economic development of rural areas in Poland".

Introduction

- ¹ The paper deals with the issue of multi-functional development of rural areas in the light of diversification of income sources in agricultural holdings. The problem has been undertaken by many Polish researchers (e.g. Dzun, 2005; Frenkel, 2003; Kaczmarek, 2014; Kłodziński, 1998, 1999; Kołodziejczyk, 2004; Kulikowski, 2005; Pałka, 2004; Rosner, 2012; Stanny, 2013; Zegar, 2006, 2008) and foreign researchers alike (Knickel and Renting, 2000; Morgan, Marsden, Miele *et al.*, 2010; Ploeg and Roep, 2003; Wilson, 2008). Their studies posit that multi-functional development usually relies in economic diversification for the sake of improving life standards and work conditions of rural population. The matter is particularly important in Poland due to a considerable share of areas characterised by the

domination of the agricultural function (Bański, 2006). As it is, the departure from the conception that rural areas are mono-functional, dominated by the agricultural function, is a fundamental condition for social and economic development of these areas. That development is identified with more extensively diversified forms of non-agricultural economic activity, particularly on-farm economic activity. The paper presents the results of the spatial analysis of agricultural holdings in Poland, where their structure is studied by income sources, with special emphasis placed on agricultural holdings with agriculture-related economic activity.

- 2 The process of multi-functional development of rural areas has been present in Europe since 1980s, mostly in the European Community. In the structure of rural development one can differentiate three basic processes: deepening, broadening and re-grounding. Typical expressions of deepening fields of activity are: organic farming, the production of high quality products and the creation of new short linkages between production and consumption. Broadening can follow from agritourism: the management of nature and landscape for the purposes of developing and diversifying new on-farm activities. The farm enterprise is grounded in a new or different set of resources involved in novel patterns of resource use. (Ploeg and Roep, 2003). The activity of cooperatives includes such important areas as: well-being services, renewable energy generation based on the use of substrates from agricultural sources, small-scale production, provision of services to the elderly and support of tourism. (Brodziński and Pawlewicz, 2016). In economically stable EU countries, diversification represents a strong feature of rural economies, while in countries affected by economic crisis, the number of farms with other income-generating activities is significantly lower (Kapsdorferova, Filo, Kadlecikova, 2015).
- 3 Therefore, when the process of diversification of economic activities in rural areas in Western Europe reached an advanced stage, Poland was still at the level of system transformations. The Polish economy had to adjust to the free market principles. Consequently, multi-functional development of rural areas in Poland is well delayed.

Methods

- 4 The analysis tackled the issue of how income sources in agricultural holdings are spatially diversified, taking into account the administrative division of Poland into 16 voivodships and 314 country districts (kind of *powiat*) – units commonly identified with rural areas (while townships – units characterised by concentration of the biggest towns and cities in Poland – were excluded from the analysis).

Figure 1. Spatial scope of studies – voivodships in Poland.

Numbers ascribed according to the alphabetical order of voivodships (I-XVI) and their capitals (1-16): I/1 – Dolnośląskie Voivodship/ Wrocław; II/2 – Kujawsko-Pomorskie Voivodship/ Toruń; III/3 – Lubelskie Voivodship/ Lublin; IV/4 – Lubuskie Voivodship/Zielona Góra; V/5 – Łódzkie Voivodship/ Łódź; VI/6 – Małopolskie Voivodship/ Kraków; VII/7 – Mazowieckie Voivodship/ Warszawa; VIII/8 – Opolskie Voivodship/ Opole; IX/9 – Podkarpackie Voivodship/ Rzeszów; X/10 – Podlaskie Voivodship/ Białystok; XI/11 – Pomorskie Voivodship/ Gdańsk; XII/12 – Śląskie Voivodship/Katowice; XIII/13 – Świętokrzyskie Voivodship/Kielce; XIV/14 – Warmińsko-Mazurskie Voivodship/Olsztyn; XV/15 – Wielkopolskie Voivodship/Poznań; XVI/16 – Zachodniopomorskie Voivodship/Szczecin.

SOURCES: OWN STUDY

- 5 According to the Central Statistical Office, an agricultural farm means 'agricultural land together with forest land, buildings or their parts, equipment and livestock if they form or may form an organized economic whole, and the rights related to running an agricultural farm' (*Charakterystyka...*, 2010, p. 20). The paper also distinguishes a discrete category of agricultural holdings with agriculture-related activity, i.e. crop production (including all agricultural crops, vegetable production and horticulture, arboriculture, agricultural and horticultural crops and seed production), livestock farming and 'activity consisting of maintaining unused agricultural land for production purposes according to the rules of a good agricultural practice in accordance with environmental protection requirements' (*Instrukcja rachmistrza...*, 2010, p. 16).
- 6 The paper is also an attempt at the spatial evaluation of the distribution of the European funds dedicated for agricultural holdings with the aim of making them more focused on non-agricultural activities. For the purposes of such a study the authors took advantage of the data by the Agency for Restructuring and Modernisation of Agriculture (ARMA), which is the payer of European funds for agriculture in Poland, related to the number of processed applications for the support for diversification of economic activity in the period of 2002-2010, including the Special Accession Programme for Agriculture and Rural Development (SAPARD, 2002-2004; SAPARD Operational Programme..., 2002; Rudnicki, 2008), Sectoral Operational Programme 'Restructuring and modernisation of

the food sector and rural development 2004-2006' (SOP Agriculture – period 2004-2006; Sectoral Operational Programme..., 2004; Rudnicki, 2009, 2010), and Rural Development Programme (RDP, 2007-2013; data for period 2007-2010 applied; Rural Development Programme ...; Rudnicki, 2012).

- 7 Another source of information for this paper was the Local Data Bank by the Central Statistical Office with data on the number of business entities entered into the Register of Business Entities [REGON], the compilation of which – including agricultural holdings with agriculture-related activity – facilitated establishment of the total number of business entities and definition of the relation between agricultural and non-agricultural units, the relation being fundamental for the analysis of the diversification of economic activity in rural areas. On the other hand, the share of holdings benefiting from the European aid measures designed for diversification of economic activity in the total number of business entities entered into the Register of Business Entities [REGON] was the basis for assessing the impact of the European funds from the perspective of the entrepreneurial growth in agricultural holdings.
- 8 For the sake of a more comprehensive evaluation of the spatial patterns which evolved, the issue of non-agricultural economic activity was juxtaposed with the below-specified determinants and their spatial patterns, i.e.:
 - natural (assessment of the impact of natural factors on incomes in agricultural holdings) – by means of the agricultural production area quality index (average APAQI = 66 points) – with the following categorisation of *poviats*: below and above the national average;
 - historical (assessment of the impact of political and economic events on incomes in agricultural holdings) – the analysis was carried out within the timeframe marked by the important events of: 1815 (Congress of Vienna, which maintained the political division of the Polish territory); 1919 (Treaty of Versailles, which gave rise to the state of Poland); and 1945 (Potsdam Conference, which delineated the current political borders of Poland); it facilitated the division of the *poviats* of the present-day Poland into two basic groups, taking into account the fact that for over a century agriculture was exposed to different political and economic systems: land belonging to the Prussian Partition featuring a high level of human development (referred to as 'West Poland') and land belonging to the Austrian and the Russian Partitions characterised by a lower level of human development (referred to as 'East Poland');
 - agrarian (assessment of the impact of farm size on incomes in agricultural holdings) – whereby 8.2 ha was accepted as the average acreage of an agricultural holding with agricultural activity (according to NAC 2010) and two groups of *poviats* were identified: below and above the national average (Figure 2).

Figure 2. Selected determinants of incomes in agricultural holdings in Poland.

SOURCES: OWN STUDY ON THE BASIS OF DATA BY INSTITUTE OF SOIL SCIENCE AND PLANT CULTIVATION IN PUŁAWY (AGRICULTURAL PRODUCTION AREA QUALITY INDEX) AND LOCAL DATA BANK OF THE CENTRAL STATISTICAL OFFICE IN WARSAW (% OF PROTECTED AREAS)

- 9 The created data base was presented in form of standardised values. The standardisation method employed for these purposes involved replacing the original value with the result of multiplication of the difference between a feature value and its mean average by the standard deviation value. Owing to that procedure all of the variables were comparable, the average of their statistical distributions equalled zero and their variances and standard deviations were expressed in full unity digits (Racine, Raymond, 1977).
- 10 The analysis also employed the method of subsequent quotients (D'Hondt Method) - one commonly used in spatial studies of agriculture and enabling an objective analysis of any structure. Here, the absolute values or percentage ratios of individual elements in the analysed structure are divided by subsequent numbers from 1 to n, then the highest results are selected from the set and a weight is ascribed to a particular element, depending on how many numbers from the division are qualified to the new subset. What made the basis for the spatial delimitation of the analysed structures was the highest six quotients which showed what share a particular element had: 1 - very small; 2 - small; 3 - considerable; 4 - big; 5 - very big; 6 - dominant in the structure.

Results and discussion

- 11 According to NAC 2010, there were 2.2 mln agricultural holdings in Poland, in which the following income sources were recorded: agricultural activity, non-agricultural activity, hired work, old-age pensions, disability pensions and other unearned. On average, there were 1.73 income sources in an agricultural holding. This index of income diversification

in agricultural holdings had a highly varied territorial distribution – both at the level of voivodships and *poviats* (Figure 2).

Figure 2. The total number of income sources per agricultural holding (2010).

SOURCES: OWN STUDY BASED ON NAC 2010

- 12 The study of the spatial distribution of the index showing the number of income sources in an agricultural holding demonstrated a significant impact of the natural and agrarian determinants and a strong impact of the historical determinant. The analysis yielded higher index values in the areas characterised by historically-defined, bigger land fragmentation where the possibilities for a rural family to earn their living were limited to farm work only. Another phenomenon which emerged from the study was a disadvantageous decrease in the number of income sources in agricultural holdings operating in unfavourable natural conditions. In that case, stimulation of these agricultural holdings with additional income sources would compensate for their lower incomes from agricultural activity.
- 13 Apart from the total number of income sources, the analysis also included their structure. For these purposes, agricultural holdings with agricultural activity were divided into three groups by the dominant income source (accounting for over 50% of incomes), as below:
 1. agricultural activity (referred to as 'A') – 28.8% of all agricultural holdings.
The feature was affected by the historical conditions; thus, such agricultural holdings were more numerous in West Poland when compared to East Poland. Also, farms of above-the-average acreage, by virtue of the production scale, more often enjoyed incomes from agricultural activities;
 2. work in non-agricultural branches (hired work or related to non-agricultural business activity), (referred to as 'N') – 42.4% of all agricultural holdings.
The following regularity has been observed: owners and household members of smaller farms are more often engaged in non-agricultural activities;

3. Old-age pensions, disability pensions or other unearned incomes (referred to as 'U') – 28.9% of all agricultural holdings.
- 14 The spatial analysis demonstrated that there were more such agricultural holdings in East Poland, where historically-determined predominance of smaller farms is observed (Table 1).

Table 1. Structure of incomes in agricultural holdings - selected indices (2010).

Specification	Number of agricultural holdings [thousand]	Number of income sources in agricultural holding	Including agricultural holdings with agricultural activity categorised by main income source (above 50%) [%]			
			Agricultural incomes 'A'	Non-agricultural incomes 'N'	Old-age pensions, disability pensions and other unearned income 'U'	Type (sub-type)
Poland – country districts	2202.3	1.73	28.8	42.4	28.9	IV (A2 N2 U2)
by voivodship						
Dolnośląskie	102.2	1.63	23.6	46.2	30.2	III (A1 N3 U2)
Kujawsko-Pomorskie	84.5	1.61	53.3	29.2	17.5	V (A3 N2 U1)
Lubelskie	254.0	1.87	29.8	40.2	30.0	IV (A2 N2 U2)
Lubuskie	41.6	1.53	21.5	45.2	33.3	III (A1 N3 U2)
Łódzkie	165.9	1.73	33.2	43.0	23.8	III (A2 N3 U1)
Małopolskie	279.6	1.76	13.9	50.5	35.7	III (A1 N3 U2)
Mazowieckie	267.3	1.73	37.1	41.0	21.9	III (A2 N3 U1)
Opolskie	44.2	1.65	31.4	43.0	25.5	III (A2 N3 U1)
Podkarpackie	253.4	2.01	9.0	48.5	42.5	II (N3 U3)
Podlaskie	101.9	1.67	48.1	32.9	19.0	V (A3 N2 U1)
Pomorskie	57.1	1.52	40.9	37.6	21.5	V (A3 N2 U1)
Śląskie	138.2	1.47	11.3	49.4	39.2	II (N3 U3)
Świętokrzyskie	142.1	1.71	25.9	41.4	32.6	III (A1 N3 U2)
Warmińsko-Mazurskie	65.8	1.48	44.0	34.7	21.3	V (A3 N2 U1)
Wielkopolskie	158.6	1.72	42.9	36.6	20.5	V (A3 N2 U1)
Zachodniopomorskie	45.9	1.61	30.6	42.2	27.2	III (A2 N3 U1)

SOURCES: OWN STUDY BASED ON NAC 2010

- 15 In order to present that structure, the method of subsequent quotients was used and five types of agricultural holdings were distinguished.
- Type I – outstanding ratio of agricultural holdings where old-age pensions and other unearned incomes dominate (4 *poviats*);
- Type II – similar ratio of agricultural holdings where non-agricultural incomes, as well as pensions and other unearned incomes dominate (28 *poviats*);
- Type III – highest ratio of agricultural holdings where non-agricultural incomes dominate (149 *poviats*);
- Type IV – similar ratio of agricultural holdings where agricultural incomes, non-agricultural incomes, as well as pensions and other unearned incomes dominate (29 *poviats*).
- Type V – highest ratio of agricultural holdings where agricultural incomes dominate (104 *poviats*).

Figure 4. Types of agricultural holdings with agricultural activity by major source of incomes.

SOURCES: OWN STUDY BASED ON NAC 2010

- 16 In the analysis of income sources in agricultural holdings a special attention should be paid to agricultural holdings with agricultural activity and their share in the total number of agricultural holdings and in the total number of business entities operating in rural areas. In the rural areas in Poland in 2010, on average, 83.8% of agricultural holdings ran agriculture-related activity.
- 17 In order to analyse the diversification of income sources in rural areas, in particular with regard to the relations between agricultural and non-agricultural units, the concept of economic unit was introduced (4.02 million); it is to be interpreted as the sum of registered non-agricultural business entities (REGON) and agricultural holdings with agricultural activity. Then, the analysis was based on the ratio of agricultural holdings to the total number of economic units. On average, it was 45.9% in Poland, which meant a balanced agricultural/non-agricultural economic growth of rural areas. However, the ratio was highly diversified territorially (Figure 5). First and foremost, the analysis of the spatial patterns proved a very strong impact of historical conditions. In the *poviats* located in East Poland, where the area of agricultural holding is historically-determined and is below the national average, there was a higher percentage of agricultural holdings with agriculture-related activity, when compared with the number of economic units.

Figure 5. The ratio of agricultural holdings to the total number of economic units (% , 2010).

SOURCES: OWN STUDY BASED ON NAC 2010

- 18 With the agricultural function being in the dominant position and the poor economic standing of the majority of agricultural holdings, if the rural areas in Poland are to be stimulated, first and foremost, non-agricultural activity must be present there. It is absolutely inevitable for multi-functional development of rural areas (Bański, 2003; Kłodziński, 1998, 1999; Kołodziejczyk, 2004; Pałka, 2004). With this respect, it is of utmost importance for farmers to take up non-agricultural activity. It is so because this kind of activity improves the financial situation of the rural household and reduces the seasonal income instability which is characteristic of the agricultural production – income fluctuations (Zegar, 2006, 2008). This kind of business activity also contributes to a more efficient management – it usually leads to the utilisation of excess workforce and a better utilisation of the buildings, machines and equipment which are already available in an agricultural holding (Dzun, 2005).
- 19 According to NAC 2010, in Poland there were 360.8 thousand agricultural holdings with incomes from non-agricultural activity, which – on average – comprised 16.4% of all agricultural holdings. The case of *poviats* with the highest value of the index – over 25% – points out that this phenomenon is associated with the highly-diversified nature of non-agricultural activities run in these holdings, which is also related to the fact that these areas are both highly-urbanised (within the impact zone of large urban agglomerations) and poorly-urbanised (particularly areas attractive for tourism) (Figure 6).
- 20 Farmers in Poland rarely undertake non-agricultural activity. It is mostly due to economic problems: insufficient financial means for preparation of relevant documents, renovation, construction works and purchase of necessary equipment. The situation is improving gradually (share of agricultural holdings with non-agricultural activity grew from 12.3% [NAC, 2002] – Kołodziejczyk, 2008, p. 164 – to 16.4% [NAC, 2010]); it also

requires external financial support, and – most importantly – puts on farm owners the necessity to apply for funds from a range of European programmes, i.e.:

- Special Accession Programme for Agriculture and Rural Development (SAPARD), including the scheme ‘Generation of additional income in agricultural holdings’ – 2003/2004 (1,490 applications processed);
- Sectoral Operational Programme ‘Restructuring and modernisation of the food sector and rural development’, including the measure ‘Diversification of agricultural and agriculture-related activities to guarantee variety of activities or alternative income sources’ (SOP Agriculture) – 2004-2006 (4,083 applications processed);
- Rural Development Programme (RDP), including the measure ‘Diversification into non-agricultural activities’ – 2007-2013 (for the purposes of the analysis only data covering the period until the end of 2010 were used, i.e. 3,059 applications processed) (Rudnicki, 2016).

- 21 On the whole, in Poland in the period of 2002-2010 there were 8,629 agricultural holdings which benefited from the measures supporting investment in non-agricultural activities. The ratio of these applications was negligible (2.4%) in the total number of agricultural holdings with incomes from non-agricultural activity. The figures varied across voivodships from 1.4% in the Dolnośląskie Voivodship (south-western Poland) to 3.7% in the Pomorskie, Podlaskie and Warmińsko-Mazurskie Voivodships (north-eastern Poland). These observations testify to the low impact of the European funds dedicated for increasing the number of agricultural holdings with non-agricultural activity. On the other hand, the agrarian determinant emerged in the spatial analysis as one having a significant impact. Thus, it can be concluded that the size of agricultural holding bears on the income potential and the amount of funds for launching non-agricultural activity (Dubownik, 2010).
- 22 With regard to entrepreneurship in rural areas, the impact of the EU support for farmers embarking on non-agricultural activities was weak; strong, however, was its regional diversification. It was mostly aimed at accelerating growth in East Poland. This indicator is so low because it applies to all registered businesses rather than to agricultural holdings only.

Figure 6. Agricultural holdings – beneficiaries of European support for diversification of economic activities in period 2002-2010 per 1 thousand economic entities registered with REGON.

SOURCES: OWN STUDY BASED ON DATA BY THE ARMA AND CENTRAL STATISTICAL OFFICE (NAC 2010)

- 23 The period under analysis witnessed growing diversification of economic activity in the rural areas in Poland covered with the European support measures; it happened thanks to new enterprises providing services for rural inhabitants, agriculture and forestry, as well as services in the domain of tourism and agri-tourism. Transport and construction services were of lesser importance (Figure 7).

Figure 7. Diversification of non-agricultural farm business structure within the framework of support measures from the EU – participation (%).

SOURCES: OWN STUDY BASED ON ARMA MANAGEMENT INFORMATION SYSTEM

Conclusions

- 24 The analysis showed a vast diversification in the structure of incomes in Polish agricultural holdings. What proves that the agriculture is developing towards multi-functionality is a modest importance of areas with agricultural holdings where incomes from agricultural activity predominate, especially when compared with the share of agricultural holdings surviving on incomes generated beyond agriculture. Another rise recorded – in relation to incomes from agriculture – was in the share of agricultural holdings with incomes from old-age pensions, disability pensions and other unearned income sources. This indicates that rural population is ageing, which means that new challenges in the domain of social policy need to be faced, in particular with regard to provision of care services to the elderly.
- 25 The paper also deals with the European aid measures in terms of their impact on the condition of entrepreneurship and labour market in rural areas. The study evinced their small but positive influence, showed their role in reducing the spatial disproportions in the economic growth of rural areas in Poland, particularly in fostering entrepreneurship in the rural areas of eastern Poland. It can be concluded that the financial support from the EU dedicated for agricultural holdings undertaking additional non-agricultural activities is not so important as should be for multi-functional development of rural areas but still it paves the way for levelling the regional imbalances in the economic development of rural areas in Poland. The only matter which can raise reservations is the relatively slow pace of these hope-inspiring changes.

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ABSTRACTS

The article presents the results of the spatial analysis of Polish private agricultural holdings with agriculture-related business activity. The studies involved 1.8 million agricultural holdings categorised into three groups by the dominant source of income (constituting over 50% of all the incomes of the holding), i.e.: incomes from agriculture-related activity; incomes from work in non-agricultural sector (hired work or connected with non-agricultural business activity); and incomes from old-age pensions, disability pensions or other unearned incomes.

These percentages were analysed individually or in form of composite index and they were characterised by significant differences in the spatial distribution, which was due to the impact of several conditions – particularly: historical and agrarian determinants, as well as the absorption level of the CAP funds. It emerged that the natural conditions do not wield any remarkable influence on the incomes recorded in agricultural holdings in Poland, which derives from the fact that in the areas with less favourable natural conditions animal production is better-developed and members of an agricultural holding are engaged in more non-agricultural professional activities.

The analysis showed a non-negligible diversification in the income structure of agricultural holdings in Poland. What can prove the progressing multi-functional development of agricultural holdings is a low rank of farms where incomes are generated mostly by agriculture-related activities, which is particularly conspicuous upon comparison with the percentage of agricultural holdings with incomes from work in non-agricultural sectors. An increase was also observed in the share of agricultural holdings with incomes made up of old-age pensions, disability pensions and other unearned incomes. It points to the ongoing process of ageing in rural population, which requires setting and meeting new objectives in the domain of social policy, especially with regard to provision of care for the elderly.

L'article présente les résultats d'une analyse spatiale des exploitations agricoles individuelles qui mènent leur activité en Pologne. L'analyse a été basée sur 1,887 millions de ménages répartis sur 16 régions et 314 districts divisés en trois groupes selon la source de revenu prédominante (plus de 50 %), à savoir : les revenus d'origine agricole – 28,3%, les revenus à partir d'une activité non agricole (activité salariée ou entreprise non agricole) – 42,5% et les revenus à partir de la perception de la retraite, d'une allocation ou d'autres revenus non lucratifs – 29,2% de l'ensemble des exploitations agricoles d'après le Recensement agricole 2010.

Les chiffres cités ci-dessus, analysés en tant que traits individuels et ayant la forme d'indice synthétique (nous avons utilisé la méthode de calcul D'Hondt en définissant les types de structure), se caractérisaient par une forte diversité territoriale liée avec une influence de plusieurs conditions, surtout historiques, urbanistiques ou définies par le taux de l'absorption des fonds provenant de la Politique agricole commune. Les recherches n'ont pas démontré une influence importante des conditions naturelles sur la formation des revenus des exploitations agricoles en Pologne, ce qui découle du fait que sur les terrains caractérisés par des conditions naturelles plus faibles, on note dans l'agriculture un taux plus élevé de la production animale et une plus grande activité professionnelle non agricole des membres des familles agricoles.

L'analyse a montré une forte diversité de la structure des revenus des exploitations agricoles en Pologne. Le processus de développement multifonctionnel de l'agriculture est démontré par une faible position occupée par les exploitations agricoles pour lesquelles les revenus de l'activité agricole constituent la position prédominante (de tels ménages constituaient plus de 50 % de

l'ensemble des entreprises agricoles seulement dans 52 districts, soit dans 17 % des districts analysés), surtout en comparaison avec la quantité des entreprises agricoles ayant leurs revenus principaux à partir d'une activité hors l'agriculture. On a aussi remarqué le poids – par rapport aux exploitations agricoles vivant de l'activité agricole – des exploitations agricoles vivant de retraites, de pensions ou d'autres sources non lucratives. Le phénomène démontre le processus constant du vieillissement de la population agricole, ce qui implique non seulement des dangers pour le développement de la production agricole mais aussi de nouveaux enjeux dans le cadre de la politique sociale, surtout quant aux soins aux personnes âgées.

INDEX

Keywords: agricultural diversification, multi-functional development, absorption of CAP funds, non-agricultural activities, agricultural holdings, Poland

Mots-clés: diversification agricole, développement multifonctionnel, absorption des fonds provenant de la Politique agricole commune, entreprise non agricole, exploitations agricoles, Pologne

AUTHORS

ROMAN RUDNICKI

Nicolaus Copernicus University, rudnickir@umk.pl

ANNA DUBOWNIK

Nicolaus Copernicus University, a_dubownik@umk.pl

MIROSŁAW BICZKOWSKI

Nicolaus Copernicus University, mirbicz@umk.pl