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**INDIVIDUALLY-HELD AGRICULTURAL HOLDINGS
AS BENEFICIARIES OF PRO-ECOLOGICAL RDP MEASURES
IN POLAND. A SPATIAL APPROACH**

*INDYWIDUALNE GOSPODARSTWA ROLNE JAKO BENEFICJENCI
DZIAŁAŃ PROEKOLOGICZNYCH PROW W POLSCE.
UJĘCIE PRZESTRZENNE*

Key words: individually-held agricultural holdings, pro-ecological RDP measures, Poland

Słowa kluczowe: indywidualne gospodarstwa rolne, działania proekologiczne PROW, Polska

Abstract. This paper offers a spatial analysis (by district) of pro-ecological measures under the Rural Development Programme (RDP) and an assessment of individually-held agricultural holdings in terms of the absorption of means intended for their implementation. The analysis was conducted on the basis of five indices, which were standardised and presented in the form of a normalised mean. The analysis covers the years 2004-2006, i.e. the first financial perspective of Poland's EU membership. Use was made of the original database created on the basis of materials of the Agency for Restructuring and Modernisation of Agriculture (AR&MA) concerning the RDP measures "Support for less-favoured areas (LFAs)", "Support for agri-environmental ventures", and "Afforestation of agricultural land", as well as Central Statistical Office data on the number and area of agricultural holdings operating on more than 1 ha AL.

Introduction

The Polish agricultural landscape is of great value at the scale of Europe, and traditional farming is an important factor with a beneficial effect on the biodiversity of Polish landscapes [Biczkowski 2008]. Promoting an environmentally friendly type of agriculture, preserving the landscape-related assets of rural areas, protecting areas of outstanding natural value, and making agriculture sustainable have been the targets of measures implemented under the Rural Development Programme (RDP) and financed from the European Union means [Plan Rozwoju...2004]. The implementation by agricultural holdings of pro-ecological measures has also been an important factor of the restructuring and modernisation of farming and rural areas [Polna 2011, Rudnicki 2010].

Materials and methods

The aim of the paper is to present spatial results of pro-ecological measures taken in Poland under the Rural Development Programme (RDP) and to assess individually-held agricultural holdings in terms of the absorption of means intended for their implementation. The analysis embraced the measures: "Support for less-favoured areas (LFAs)", "Support for agri-environmental measures", and "Afforestation of agricultural land". The period studied was 2004-2006, i.e. the first financial period of Poland's EU membership. The basic research unit adopted was the territorial remit of a District Office of the Agency for Restructuring and Modernisation of Agriculture (AR&MA). It should be kept in mind that in the AR&MA register district-ranking towns are grouped together with the respective non-urban districts.

The study rests on unpublished AR&MA materials concerning the implementation of pro-ecological RDP measures in the years 2004-2006, and on the data of the Central Statistical Office (GUS) about the number and area of individually-held farms operating on more than 1 ha agricultural land (AL).

The analysis was carried out on the basis of five indices calculated as sums for the three-year study period 2004-2006:

- number of applications calculated per 1,000 individually-held agricultural holdings of more than 1 ha AL in area;
- area covered by the measure in ha per application;
- area covered by the measure in ha per 1,000 ha AL;

- average EU subsidy in PLN calculated per application submitted by an individually-held agricultural holding of more than 1 ha AL in area;
- average EU subsidy in PLN calculated per 1,000 ha AL.

The above variables were subjected to a standardisation procedure according to the following formula:

$$z_{ij} = \frac{x_{ij} - \bar{x}}{S_x},$$

where:

z_{ij} – standardised value of the j -th variable for district i ,

x_{ij} – value of the j -th variable for district i ,

\bar{x} – arithmetic mean of the j -th variable, and

S_x – standard deviation of the j -th variable.

Next, for each district Perkal's synthetic indicator Ws was calculated, which is the arithmetic mean of normalised values of the five variables [Runge 2007]. The synthetic indicator was calculated from the formula:

$$Ws = \frac{1}{n} \sum_{j=1}^n z_{ij}$$

where:

$j = 1, 2, \dots, n$

n – number of variables considered, and

z_{ij} – standardised value of the j -th variable for district i .

The indicator thus determined was employed to assess the absorption of Community funds under pro-ecological measures by individually-held agricultural holdings of over 1 ha AL in area.

On the basis of the Ws indicator, five levels of RDP fund absorption were distinguished:

- very low (under -0.50),
- low (from -0.5 to -0.3),
- average (from -0.3 to +0.3),
- high (from +0.3 to +1.5), and
- very high (over +1.5).

Support for agricultural activity in less-favoured areas (LFAs)

Under the LFA measure, individually-held agricultural holdings were granted more than 2,077,400 applications, from 19,000 in Opole province to 384,600 in Mazovia. By district, the greatest number (over 41,000 applications) was recorded in Biała Podlaska district in Lublin province. A total of 3,702,600,000 PLN were paid, from 30.8 million in Opole province to 684 million in Mazovia. By district, the figures varied between 6,700 PLN in Kazimierza Wielka (Świętokrzyska Land) to nearly 85,000 PLN in Ostrołęka (Mazovia). For the country, the average proportion of payments under this measure in the total RDP funds obtained was 34.5%.

The indices adopted to assess the absorption of LFA-targeted RDP funds included:

- number of applications calculated per 1,000 individually-held agricultural holdings (national average: 1,066 applications), ranging from 431-457 in Silesia and Opole provinces to 2,068 in Podlasie, with the greatest number of applications per 1,000 farms – 2,993 (recorded in Żuromin district in Mazovia);
- area embraced by the measure in ha calculated per application (national average: 10.1 ha): from 3.4 ha Małopolska to 26.5 ha in West Pomerania, and by district, from 2.3 ha in Dąbrowa Tarnowska (Małopolska) to 72.1 ha in Malbork (Pomerania) and 92.3 ha in Pyrzyce (West Pomerania);
- area embraced by the measure in ha calculated per 1,000 ha AL (national average: 1,405 ha): from 472 ha in Opole province to 2,710 ha in Lubuska Land; by district, the highest figures were recorded in Słubice in Lubuska Land (5,229 ha) and Pyrzyce in West Pomerania (5,191 ha);
- average amount of the EU subsidy in PLN calculated per application (national average: 1,782 PLN): from 937 PLN in Małopolska to more than 3,000 PLN in Warmia-Mazuria (3,080) and West Pomerania (3,157), and by district, from 426 PLN in Dąbrowa Tarnowska (Małopolska) to 5,138 PLN in Nowy Dwór (Pomerania);
- average amount of the EU subsidy in PLN calculated per 1,000 ha AL embraced by the measure (national average: 183 PLN): from 120 PLN in West Pomerania to 278 PLN in Małopolska, and by district, from 47 PLN in Malbork (Pomerania) to 338 PLN in Strzelin (Lower Silesia).

The obtained values of Perkal's synthetic indicator show that the absorption of RDP funds granted

under the LFA measure varied between -0.80 in Opole province to +0.94 in Podlasie. Spatial differences in the value of this indicator were wide (Fig. 1).

While farms applied to obtain RDP funds in all districts, in none of them was the absorption level very high. It was high in 94 districts, average in 100, low in 48, and very low in 72. Districts with a high absorption level indicative of farmers' marked interest in ecologically balanced mode of farming can be found primarily in the north-eastern, northern and north-western parts of the country, where they form extensive clusters. The highest value of the indicator (over 1.0) was recorded in the districts of Sepólno Krajeńskie (Kujavia-Pomerania), Słubice (Lubuska Land), Mława and Ostrołęka (Mazovia), Grajewo, Kolno, Sejny and Suwałki (Podlasie), Nidzica and Pisz (Warmia-Mazuria) as well as Police, Pyrzyce, Świdwin, Wałcz, and Łobez (West Pomerania).

Districts with an average absorption level include single units in Lublin province (Łuków) and Silesia (Zawiercie) to about a dozen in Mazovia (13), Łódź (14) and Wielkopolska (14).

Districts with the lowest absorption level, indicating the LFA measure to have a negligible effect on ecologically balanced mode of farming in them, can mostly be found in the southern and south-eastern parts of the country.

Support for agri-environmental ventures

Under this RDP measure, individually-held agricultural holdings were granted nearly 78,000 applications, from 1,200 in Opole province to 11,900 in Lublin province. By district, the figures ranged from 10 applications in Strzelin (Lower Silesia) to over 1,000 in Włodawa (1,096, Lublin province), Opatów (1,192, Świętokrzyska Land), Limanowa (1,201, Małopolska) and Biała Podlaska (2,672, Lublin province). A total of 814,900,000 PLN were paid, from 12.7 million in Silesia to 118.6 million in West Pomerania. By district, the figures varied between 48,000 PLN in Chrzanów (Małopolska) and 69,000 in Wodzisław (Silesia) to 16.6 million in Biała Podlaska (Lublin province). For the country, the average proportion of payments under this measure in the total RDP funds obtained was 7.6%.

The indices adopted to assess the absorption of agri-environmental RDP funds included:

- number of applications calculated per 1,000 individually-held agricultural holdings (national average: 40 applications): from 11 applications in Silesian provinces to 106-107 in Pomerania and West Pomerania, with the greatest number of applications per 1,000 farms - 368 - recorded in Ustrzyki Dolne district in Subcarpathia;
- area embraced by the measure in ha calculated per application (national average: 16.3 ha): from 6.5 ha in Świętokrzyska Land to 39.5 ha in West Pomerania, and by district, from 3.1 ha in Strzyżów (Subcarpathia) to 95.7 ha in Pyrzyce (West Pomerania);
- area embraced by the measure in ha calculated per 1,000 ha AL (national average: 55.8 ha): from 6.5 ha in Opole to 185.1 ha in Lubuska Land; by district, the highest figure was recorded in Police in West Pomerania (879.1 ha);
- average amount of the EU subsidy in PLN calculated per application (national average: 10,500 PLN): from 5,200 and 5,400 PLN in Małopolska and Łódź to 26,800 in West Pomerania, and by district, from 1,600 PLN in Żywiec (Silesia) to 1,328,600 in Olesno (Opole); and
- average amount of the EU subsidy in PLN calculated per 1,000 ha AL embraced by the measure (national average: 576 PLN): from 428 PLN in Subcarpathia to 6,937 in Opole, and by district, from 39 PLN in Dębica (Subcarpathia) to 20,200 in Krapkowice (Opole).

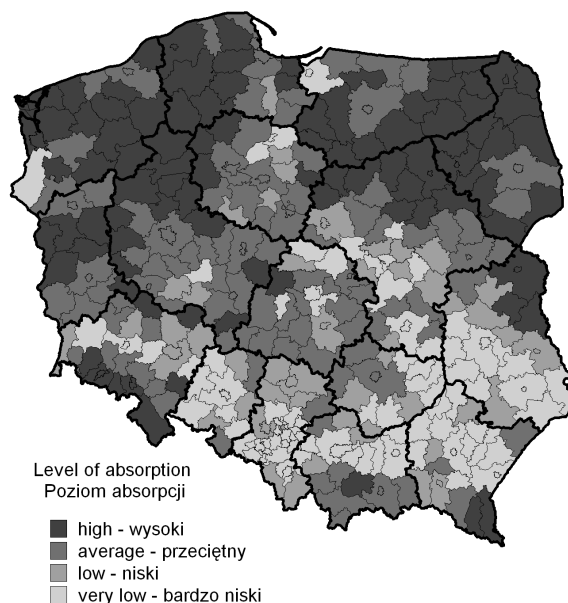


Figure 1. Absorption of RDP funds by individually-held agricultural holdings under the LFA measure

Rysunek 1. Absorpcja środków PROW przez indywidualne gospodarstwa rolne z tytułu ONW

Source: own study based on AR&MA and GUS data

Źródło: opracowanie własne na podstawie danych ARiMR i GUS

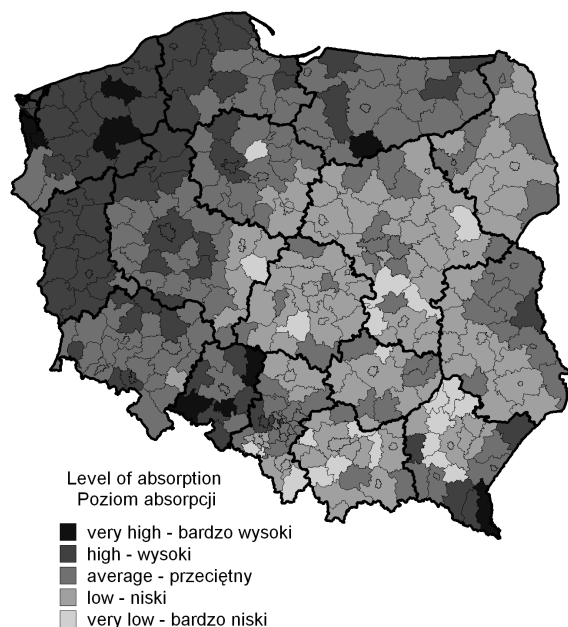


Figure 2. Absorption of RDP funds by individually-held agricultural holdings under agri-environmental ventures
Rysunek 2. Absorpcja środków PROW przez indywidualne gospodarstwa rolne z tytułu przedsięwzięć rolnośrodowiskowych
 Source: see fig. 1
 Źródło: jak na rys. 1

south-eastern (Subcarpathia, Małopolska and Świętokrzyska Land) parts of the country. Their greatest number was recorded in Mazovia (29 districts) as well as in Łódź and Małopolska provinces (16 in each).

Afforestation of agricultural land

Under this measure, individually-held agricultural holdings were granted nearly 9,000 applications, from 122 in Opole province to 1,300 in Mazovia and Subcarpathia. By district, the greatest number of applications (167) was recorded in Biała Podlaska (Lublin), while in four districts: Dzierżoniów (Lower Silesia), Tatra (Małopolska) as well as Bielsko-Biała and Racibórz (Silesia), no application was submitted. The beneficiaries afforested 39,150 ha agricultural land, from under 500 ha in Małopolska (416) and Opole (379) to 6,103 ha in Mazovia and 7,236 ha in Warmia-Mazuria. By district, the most extensive afforested areas – over 1,000 ha – were recorded in two Warmia-Mazuria districts: Braniewo (1,098) and Bartoszyce (1,282), as well as in Western Warsaw district (2,132).

A total of 384,500,000 PLN were paid, from 3.5 million in Opole province and 4 million in Małopolska to 61.3 million in Mazovia and 73.6 million in Warmia-Mazuria. By district, the highest payments were obtained in Western Warsaw district (25.4 million) in Mazovia as well as in Braniewo (11.8 million) and Bartoszyce (13.6 million) in Warmia-Mazuria. For the country, the average proportion of payments under this measure in the total RDP funds obtained was 3.6%.

The indices adopted to assess the absorption of RDP afforestation funds included:

- number of applications calculated per 1,000 individually-held agricultural holdings (national average: 4.6 applications): from 1.1 applications in Małopolska to 19.5 in Warmia-Mazuria, with the greatest number of applications per 1,000 farms – 49 – recorded in Braniewo district in Warmia-Mazuria;
- afforested area in ha calculated per application (national average: 4.4 ha): from 1.7 ha in Małopolska to 9 ha in West Pomerania, and by district, from 0.4 ha in Sucha Beskidzka (Małopolska) to 38.3 ha in Pruszków (Mazovia);
- afforested area in ha calculated per 1,000 ha AL (national average: 2.7 ha): from 0.6 ha in Małopolska to 8.2 ha in Warmia-Mazuria; by district, the highest value was recorded in Wałcz in West Pomerania (36 ha);
- average amount of the EU subsidy in PLN calculated per application (national average: 42,700

The obtained values of Perkal's synthetic indicator show that the absorption of RDP funds granted under the agri-environmental measure varied between -0.79 in Małopolska to +1.71 in West Pomerania. Spatial differences in the value of this indicator were wide (Fig. 2).

The highest absorption level of RDP funds supporting agri-environmental ventures, indicative of farmers' marked interest in ecologically balanced mode of farming, can be found in eight districts: Krapkowice, Nysa and Olesno (Opole province), Ustrzyki Dolne (Subcarpathia), Nidzica (Warmia-Mazuria) as well as Białogard, Drawsko and Police (West Pomerania). In Police district, the indicator assumed its highest value, at +3.01.

The absorption level was high in 66 districts, average in 121, low in 97, and very low in 22. Districts with a high absorption level form a compact group in the north-west and west of Poland; only a few are in the rest of the country where they form small clusters.

Districts with the lowest absorption level, indicating the agri-environmental RDP measure to have a negligible effect on preventing the deterioration of the environment, can mostly be found in the central (Mazovia and Łódź), eastern (Podlasie and Lublin) and

PLN): from 16,100 PLN in Małopolska to 96,200 in West Pomerania, and by district, from 2,000 PLN in Sucha Beskidzka (Małopolska) to 295,600 in Pruszków (Mazovia);

- average amount of the EU subsidy in PLN calculated per ha afforested farmland (national average: 7,430 PLN): from 5,319 PLN in Lublin province to 8,447 in West Pomerania, and by district, from 1,011.5 PLN in Wrocław (Lower Silesia) to nearly 10,800 in Strzelce Opolskie (Opole province).

The obtained values of Perkal's synthetic indicator show that the absorption of RDP funds granted under the afforestation measure varied between -1.07 in Małopolska and +1.93 in Warmia-Mazuria. Spatial differences in the value of this indicator were wide (Fig. 3).

Apart from districts displaying no activity in obtaining afforestation funds (4), there were districts with a very low (61), low (73), average (105), high (56) and very high (15) level of their absorption.

Districts with a very high level of absorption of means intended to support farmland afforestation, indicative of farmers' marked interest in the rationalisation of the land-use pattern on their holdings, were most numerous in Lower Silesia, Silesia and Warmia-Mazuria (3 districts in each). The highest value of the indicator (over +3.0) was recorded in the districts of Wałecz (West Pomerania), Bieruń-Lędziny (Silesia) and Braniewo (Warmia-Mazuria).

Districts with a high absorption level are mainly located in the north (Warmia-Mazuria, Pomerania and West Pomerania) and west (Lubuska Land). In the rest of the country, districts of this type are few and single.

Districts with the lowest absorption level, showing the afforestation measure to have a negligible effect on improving their land-use pattern, can largely be found in the provinces of Łódź (7), Lublin (8), Wielkopolska (8), Małopolska (9) and Mazovia (11), where they form small clusters.

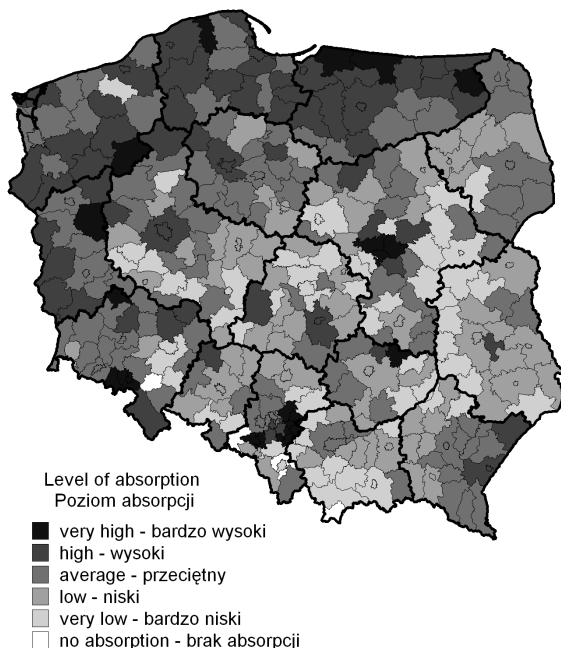


Figure 3. Absorption of RDP funds by individually-held agricultural holdings under afforestation of agricultural land
Rysunek 3. Absorpcja środków PROW przez indywidualne gospodarstwa rolne z tytułu zalesień gruntów rolnych

Source: see fig. 1

Źródło: jak na rys. 1

Conclusions

The analysis showed there to be wide spatial differences in the use of RDP funds intended for the implementation of pro-ecological measures by individually-held farms of over 1 ha AL, both at the province and district levels. This is largely due to the territorially variable activity of those farms in terms of absorption of the RDP assistance, but also to the mutually exclusive measures being analysed (LFAs and Afforestation of agricultural land) as well as to agricultural producers being under-informed as to the conditions and procedure of application for financial assistance, because the measure "Afforestation of agricultural land" had not been preceded by consultancy services and training courses.

The study showed the level of absorption to be high in two provinces: Warmia-Mazuria and West Pomerania. In both the subsidies obtained were for the afforestation of agricultural land; besides, in Warmia-Mazuria the support also included agricultural activity in LFAs, and in West Pomerania, agri-environmental ventures. The most active agricultural holdings under the LFA measure could be found in Podlasie. In all those areas agricultural holdings – thanks to the pro-ecological RDP programmes – greatly helped to maintain balanced farming. What is more, in return for their environmental services, they earned an additional income, which automatically contributed to their modernisation, and thus to an improvement in the living conditions and the development of the countryside.

Bibliography

- Biczkowski M.** 2008: Rola Planu Rozwoju Obszarów Wiejskich w rozwoju obszarów przyrodniczo cennych. [W:] Współczesne problemy badawcze geografii polskiej – geografia człowieka (ed. D. Świątek, M. Bednarek, P. Silka). *Dokumentacja geograficzna*, 36. Warszawa, 81-87.
- Plan Rozwoju Obszarów Wiejskich. 2004: MRiRW, Warszawa.
- Polna M.** 2011: Indywidualne gospodarstwa rolne jako beneficjenci Działania 5. PROW „Zalesienia gruntów rolnych” w województwie wielkopolskim. *Journal of Agribusiness and Rural Development*, 3(21). Wyd. UP w Poznaniu, 81-91.
- Rudnicki R.** 2010: Zróżnicowanie przestrzenne wykorzystania funduszy Unii Europejskiej przez gospodarstwa rolne w Polsce. Bogucki Wyd. Nauk., Poznań.
- Runge J.** 2007: Metody badań w geografii społeczno-ekonomicznej – elementy metodologii, wybrane narzędzia badawcze. Wyd. Uniwersytetu Śląskiego, Katowice.

Streszczenie

W artykule dokonano analizy przestrzennej działań proekologicznych PROW oraz oceny indywidualnych gospodarstw rolnych z punktu widzenia poziomu absorpcji środków przeznaczonych na ich realizację. Analizę objęto wsparcie działalności rolniczej na obszarach o niekorzystnych warunkach gospodarowania (ONW), wsparcie przedsięwzięć środowiskowych oraz zalesienia gruntów rolnych. Analizę przeprowadzono w oparciu o 5 mierników, które poddano procedurze standaryzacji i przedstawiono w formie średniej wartości znormalizowanej. Wskaźnik ten przyjęto jako wyznacznik poziomu absorpcji środków unijnych w zakresie każdego z działań proekologicznych.

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