

A REGIONAL ANALYSIS OF AGRICULTURAL POTENTIAL AND FARMERS' INTEREST IN THE CAP'S RURAL DEVELOPMENT PROGRAM IN POLAND

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Abstract. The main aim of this article is to establish and present the relationship between the production potential of agriculture in Poland's voivodships and the utilization of funds from selected Rural Development Programs (RDP) 2014–2020. The Common Agricultural Policy (CAP) of the European Union has Rural Development as its “second pillar”, with the objectives of enhancing the competitiveness of agriculture and forestry; ensuring the sustainable management of natural resources and climate action; and the overall development of rural economies. The materials for this paper are based on data connected with the resources of production factors in Polish agriculture, as well as data on EU agricultural funds in Poland under RDP 2014–2020, made available by the Polish Central Statistical Office (GUS) and the Agency for Restructuring and Modernization of Agriculture (ARMA). The analysis showed that the diversification of the agricultural production potential of the different regions in Poland had an influence on the activity of farmers in applying for RDP measures. Based on the regional absorption of funds, there should be a wider range of conditions required to access selected EU programs in order to strengthen farms in areas with lower production potential.

Keywords: rural development, CAP, regional diversification

INTRODUCTION

On the whole, the modernization of farms and agriculture is key to maintaining competitiveness and ensuring the economic sustainability of rural areas. On December 12,

2014, The European Commission (EC) formally adopted the Polish Rural Development Program. The RDP was expected to provide investment support to about 200,000 farms. It also aims to achieve a goal of creating more than 22,000 jobs, as well as over 1600 producer groups (European Commission Factsheet in the 2014–2020 Rural Development Program for Poland, 2014). All support schemes and programs were targeted at small and medium-sized farms in order to enhance their production potential.

While designing their RDPs, EU countries may apply for funding through the European Fund for Rural Development (EAFRD) using a number of measures. These measures are broken down into sub-measures and can be directed towards the priority areas of the EAFRD.

In this paper, five measures of the RDP were analyzed, namely Modernization of farms aimed at improving competitiveness; Agri-environment climate action to ensure commitments to the environment and climate; Restructuring of small farms through start up aid for implementing various types of operations; Bonuses for young farmers to help such people set up new, modern and competitive farm enterprises; Organic farming aimed at converting to and maintaining organic farming practices and methods.

Prior research on RDP in Poland had assessed individual measures with their resultant effects where applicable. Gołaś (2017) stated that a typical Polish agricultural holding can be characterized by the small area

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of agricultural land and low economic size class. He further referenced that the agricultural landscape of Poland is such that many farmers possess many small agricultural holdings. As a result of this, it is always essential to adopt aid measures that will reach the highest possible number of beneficiaries. In another study, Matyka (2019) disclosed that the implementation of the main environmental activities under the RDP 2014–2020 is largely differentiated on a regional level. He further stated that the intensity of implementation of the Agri-environment climate and Organic farming measures were correlated directly with average farm size. According to Biernat-Jarka and Trebska (2018), organic farming in Poland shows quite large regional variations resulting largely from natural conditions. Sadowski et al. (2021) also described organic farms in Poland as showing high production and income inefficiencies with significant dependence on public support.

This paper aims to draw from the most relevant 2014–2020 RDP measures applied in Poland and establish the relationship between the production potential of agriculture in Poland and the use of funds from these measures. It is also important to state that the measures selected in this paper do not represent the entirety of the measures stated in the EAFRD.

To present these relationships, the methods will be presented, followed by detailed results, as well as a discussion and conclusions.

MATERIALS AND METHODS

This paper is based on published data from the Polish Statistical Office (GUS) relating to the resources of production factors in agriculture and data on EU agricultural funds in Poland, as well as data made available by ARMA on the number of applications for analyzed measures. These are Modernization of agriculture holdings, Bonuses for young farmers, Organic farming, Restructuring of small farms and Agri-environment climate action, all under the RDP 2014–2020. The agricultural production potential was analyzed based on the relationship between factors of production and agricultural productivity in individual voivodships. Agricultural potential was linked to data on the number of applications submitted in individual voivodships for the analyzed programs. Indicators characterizing the activity of farmers in different measures were determined

for each region. The reference point was the number of farms in different voivodships.

In order to assess the differentiation of agricultural potential across regions in Poland, the number of homogeneous regions was distinguished with the use of hierarchical agglomeration cluster analysis using Ward's method. This is a method appropriate for quantitative variables which involves an agglomerative clustering algorithm where groups of leaves form into branches, branches form into limbs and the limbs eventually form into the trunk. It starts out with n clusters of size 1 and continues until all the observations are included into one cluster (STAT 505-Applied Multivariate Statistical Analysis, 2022). Seven features were used to distinguish groups of voivodeships:

- Gross value of fixed assets per 1ha of UAA (PLN thousand/ha),
- UAA area per 1 working person (ha/person),
- Gross value of fixed assets per 1 working person (PLN thousand/person),
- Global agricultural production per 1ha of UAA (PLN/ha),
- Global agricultural production per 1 PLN gross value of fixed assets (PLN/PLN),
- Global agricultural production per 1 employee (PLN/person),
- Average area of a farm with an area of more than 1 ha of UAA.

The different voivodships were grouped into a number of clusters based on the relationship between factors of production, the productivity of production factors and the average farm area. This hierarchical clustering enabled the arrangement of the voivodships into four separate groups. Figure 1 presents the classification of all voivodships in Poland based on their agricultural production potential and figure 2 shows a mapped representation of all voivodships in Poland grouped according to the selected key agricultural indicators.

Region A was comprised of Lubuskie, Pomorskie, Warmińsko-Mazurskie and Zachodniopomorskie. The voivodships under region B were Lubelskie, Łódzkie, Mazowieckie and Wielkopolskie, while region C had Dolnośląskie, Opolskie, Kujawsko-Pomorskie and Podlaskie. Finally, region D was comprised of Małopolskie, Świętokrzyskie, Śląskie and Podkarpackie. The represented regions will be used in further analysis.

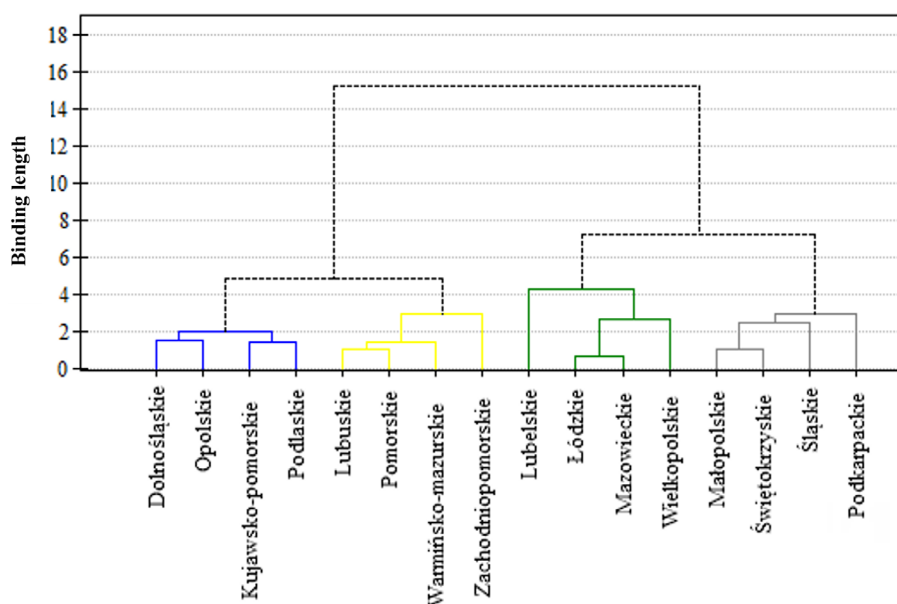


Fig. 1. Classification of voivodships in Poland based on their agricultural production potential
Source: own study.

RESULTS

Table 1 summarizes the composition and differentiation of each region based on the seven key features stated earlier.

Region A has the highest average farm area at about 15 ha. The gross value of fixed assets per 1 working person and global production per employee are the highest, while the expenditure of fixed assets per 1 ha of UAA is the lowest, resulting in the corresponding low productivity of the land.

In region B, the average area of agricultural land, number of people working in agriculture and gross value of fixed assets are relatively large. The region is also characterized by a gross value of fixed assets per 1 ha of UAA and per 1 working person that are higher than the national average. The region also has the highest value of the global production per 1 ha of UAA among all the regions in the country.

Region C has a relatively high average farm area, hovering around 11 ha. All indicators from this region are somewhat close to the national average, showing a good level of diversity and balance in terms of economic, social and demographic conditions.

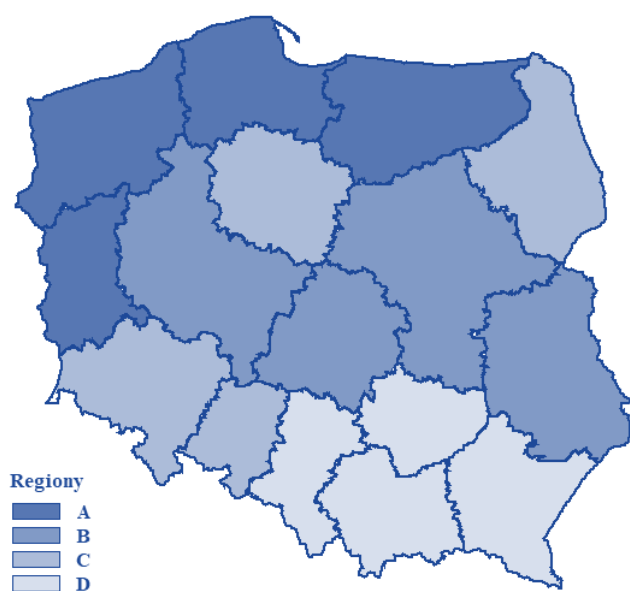


Fig. 2. Mapped representation of Polish voivodships grouped according to key agricultural indicators
Source: own elaboration based on ARMA data.

Table 1. Average values of agricultural production potential indicators featuring selected regions

Indicator	Region				Poland
	A	B	C	D	
Gross value of fixed assets per 1 ha of UAA (PLN thousand/ha)	6.76	8.93	8.06	10.35	8.43
UAA area per 1 working person (ha/person)	16.82	6.43	10.31	3.76	6.90
Gross value of fixed assets per 1 working person (PLN thousand/person)	110.94	58.41	82.82	37.97	57.48
Global agricultural production per 1 ha of UAA (PLN/ha)	4,468.75	7,161.00	5,559.50	5,662.25	6,029.68
Global agricultural production per 1 PLN gross value of fixed assets (PLN/PLN)	0.66	0.88	0.69	0.55	0.71
Global agricultural production per 1 employee (PLN/person)	71,143.00	47,205.25	56,459.75	20,578.00	40,785.31
Average area of a farm with an area of more than 1 ha of UAA	15.30	7.27	10.98	3.94	9.14

Source: own elaboration based on data from GUS.

With low values across almost all indicators, region D has the lowest agricultural production potential. The average farm area is about 4 ha and is much lower than the national average. The region is characterized by a low volume of arable land, leading to a high gross value of fixed assets per 1 ha of UAA. There is also a surplus of labour which has led to lower indexes of worker productivity in terms of labour and land.

In the process of establishing the relationship between the production potential of different regions and applications for five selected RDP measures, the following results were established.

The number of applications submitted for the measure “Modernization of agricultural holdings” was 75,217, out of which 31,154 contracts were concluded. Mazowieckie and Wielkopolskie had the highest number of applications (13,620 and 11,371 respectively) and approved contracts (4322 and 3411 respectively). Śląskie and Lubuskie had the lowest number of applications and approved contracts.

For the “Bonuses for young farmers”, a total of 29,406 applications were submitted and 18,673 applications were examined, representing 63.5% of the applications. Mazowieckie recorded the highest number of applications of 5494, followed by Wielkopolskie with 3826. The lowest number of applications came from Lubuskie (428) and Śląskie (489).

A total of 54,869 applications were submitted for “Restructuring of small farms”, of which 43,601 decisions were issued. This shows that almost 80% of all applications were approved, with Lubelskie (14656) and Mazowieckie (9476) submitting the highest number of applications, as well as receiving corresponding positive decisions. On the other hand, Opolskie (315) and Lubuskie (413) had the lowest number of applications.

There were many more applications recorded for the “Agri-environment climate action”, totaling 428,025 applications. The ratio of positive decisions was also very high at 91.7%. Lubelskie and Podkarpackie returned the highest number of applications with 52,888 and 48,509 respectively, while the lowest number of applications came from Śląskie (4886) and Opolskie (5046).

A total of 111,720 applications were submitted for “Organic farming” measure, of which 102,115 positive decisions were issued, representing 91.4% of submitted applications. Warmińsko-Mazurskie (20,818) and Podlaskie (17,470) had the highest number of applications, while Opolskie (366) and Śląskie (805) recorded the lowest number of applications.

The data presented in figures 3–7 are not relative, therefore the differences may be affected by the number of farms. In the following part of the paper, the focus will be on relative values compared to agricultural production potential.

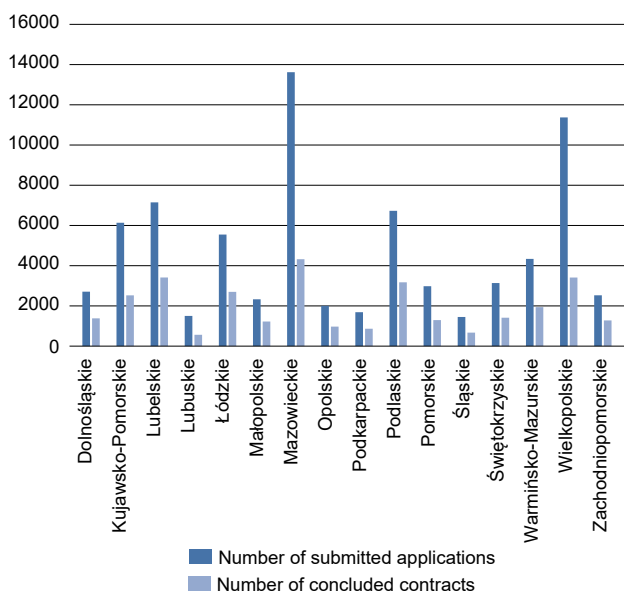


Fig. 3. Submitted applications and contracts concluded for “Modernization of agricultural holdings”

Source: own elaboration based on ARMA data, as of 31.12.2020.

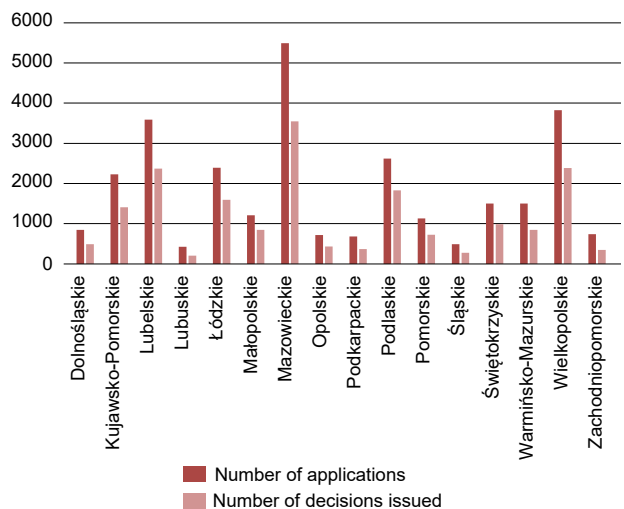


Fig. 4. Submitted applications and decisions issued for “Bonuses for young farmers”

Source: own study based on ARMA data, as of 31.12.2020.

The regional differences in applying for selected RDP measures varies with respect to the number of farms. Figure 8 and Table 3 show that the largest

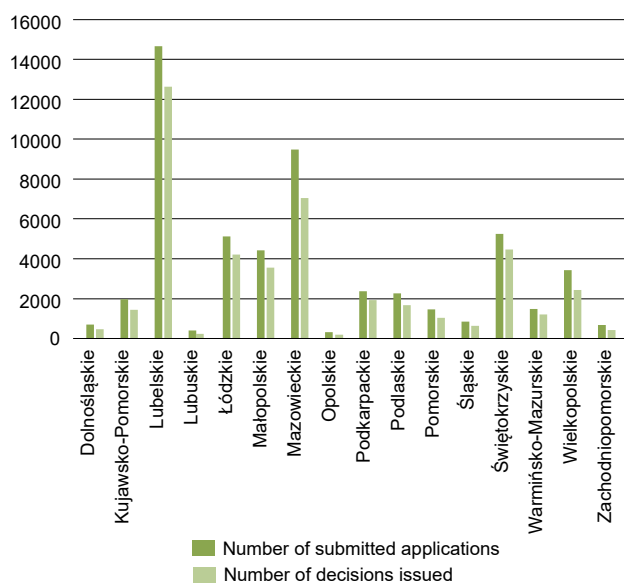


Fig. 5. Submitted applications and decisions issued for “Restructuring of small farms”

Source: own study based on ARMA data, as of 31.12.2020.

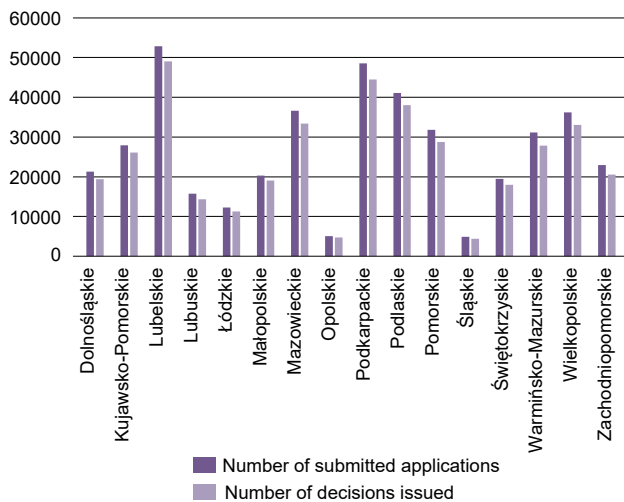


Fig. 6. Submitted applications and decisions issued for “Agri-environment-climate action”

Source: own study based on ARMA data, as of 31.12.2020.

number of applications per 100 farms came from region A, while the lowest number of applications came from region D.

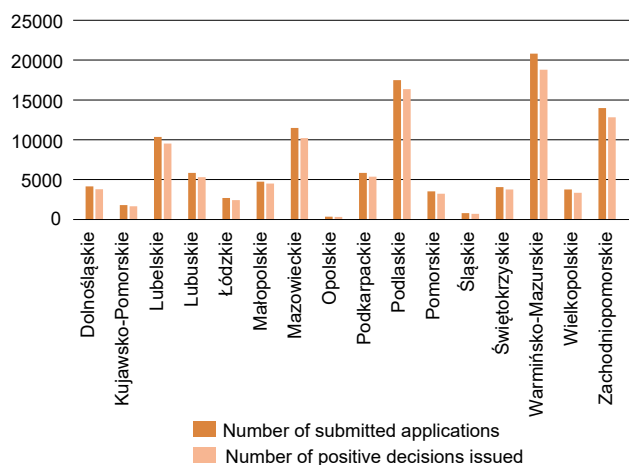


Fig. 7. Submitted applications and decisions issued for “Organic farming”
Source: own elaboration based on ARMA data, as of 31.12. 2020.

In total, region A recorded the highest number of applications per 100 farms, being the region with the largest average farm area. This region is evidently one with a very high production potential where farmers most readily benefit from EU support programs.

The environmentally related measure had a high number of applications and large differentiation on a regional level, as stated by Matyka (2019). Larger farms submitted more applications and there was a significant increase in the response to Organic farming applications. This is due to new trends among consumers, who view organic products as tastier and healthier than those from conventional agriculture, while others appreciate

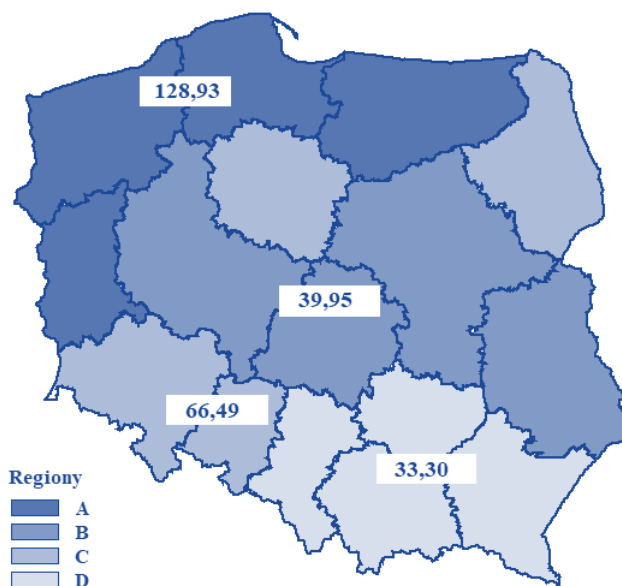


Fig. 8. Regional diversification of farmers' application for selected RDP 2014–2020 measures (number of submitted applications per 100 farms)
Source: own study based on ARMA data.

them because of good practices towards the natural environment or the workforce employed on such farms (Biernat-Jarka and Trebska, 2018).

With a high production potential, region B had the farmers who submitted the most applications on Modernization of farms and Bonuses for young farmers compared to the other regions. Having the highest global production per 1ha of UAA, it is evident that farmers in this region see the opportunity to further develop their

Table 3. Regional diversification of farmers' applications for selected RDP 2014–2020 measures (based on 100 farms)

Region	Modernization of agricultural holdings	Bonuses for young farmers	Agri-environment-climate action	Restructuring of small farms	Organic farming	Total
A	8.87	2.97	79.42	3.16	34.51	128.93
B	5.98	2.43	21.88	5.18	4.49	39.95
C	7.88	2.88	42.72	2.35	10.66	66.49
D	2.14	0.97	23.15	3.21	3.84	33.30
Poland	5.40	2.10	30.90	4.0	8.10	50.50

Source: own elaboration based on data from ARMA.

production potential, hence the application for modernization and improvement of their farms.

Also, in terms of applications per 100 farms, there was generally low interest in the measure on Bonuses for young farmers, possibly as a result of too many conditions being required to take part in the program. The voivodships under region D may also have a small number of farms managed by young farmers, hence the low interest in the application. Region D also recorded the lowest number of applications for the measures in total due to the low production potential of the region, as could be seen from production potential indicators.

DISCUSSION AND CONCLUSION

The second pillar of CAP opened up a good number of possibilities for agricultural development in rural Poland, providing financial resources that were needed to take agricultural production to the next level. Biczkowski (2019) observed that there was intensification of agricultural production in areas well placed for the development of that function. It therefore promotes the creation of economically sound agricultural holdings capable of competing with their counterparts from other EU countries. The marked differences in the rate of applications for the selected RDP measures show that there is a relationship between agricultural potential and farmers' applications for Polish RDP 2014–2020. The number of farms in the regions influences this, while the area of agricultural land varies.

Overall, based on the results obtained, it is evident that the activity of farmers in applying for the selected RDP measures 2014–2020 was very diversified. There are significant differences between the ratio of the number of submitted applications per 100 farms. In the region with the lowest production potential, where farms are highly fragmented, the ratio of the number of all submitted applications per 100 farms was the lowest.

The analysis showed that the regional diversification of the agricultural production potential in Poland had an impact on the activity of farmers in applying for Rural Development Program measures. Considering the number of submitted applications per 100 farms, it can be deduced that the most active farmers were from the Northwest of Poland, with high agricultural production potential. On the other hand, the lowest number of applications was recorded in Southeast Poland, with low production potential and a high number of small farms.

Adequate steps should therefore be taken to increase the profitability and competitiveness of small farms since they still account for a significant portion of the agrarian structure in Poland.

In the Central and Eastern parts of Poland, the rate of absorption of funds was relatively low, which could be due to the large number of small farms in the area. For future EU programs, expanding the requirements and conditions for obtaining such funds would help to minimize the low absorption of funds. This would in turn encourage farmers in areas of low production to participate in the development programs, thereby impacting positively on the agricultural sector.

Other measures of 2014–2020 RDP, such as agricultural investments, knowledge transfer and vocational training, could be analyzed further to observe relevant trends that may lead to improvements in the effectiveness of future EU Rural Development Programs.

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