



Analysis of Accessing Rural Development Funds

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Abstract. The present study aims to analyse successful projects of the Romanian Rural Development Funds from different perspectives based on a county level. The framework of the analysis focuses on two periods: one before the accession, the 2002–2006 period of SAPARD applications, and the other one, the first period of the Rural Development Programme, more specifically, the period between 2007 and 2013. Results show that there is a positive correlation between applications and targeted areas based on infrastructure, tourism, and agriculture indicators. Findings also highlight that there is a positive correlation between the number of previous applications (SAPARD applications before the accession) and the grant size of current applications. Moreover, there is a negative correlation between the grant size of previous applications and the size of current applications. Cluster analysis revealed important social changes: on the one hand, the western counties of Romania (Bihar, Arad, Timiș, and Cluj) have strengthened their position, while other counties are lagging behind.

Keywords: Romanian Rural Development Programmes, European Union support policy

JEL Classification: P25

Introduction

The present study provides a comparative analysis of accessing European Union rural development funds by Romania in the 2007–2013 period and the projects of the previous period, including their effect on relevant indicators. There are only a few studies on accessing rural development funds, and even less papers focus on comparing the results of the first period before the accession and the next, 2007–2013 period (Desjeux et al., 2015; Pelucha et al., 2017). There are several analyses in the literature focusing on narrow segments such as environmental effects (Desjeux et al., 2015). Sarvašová et al. (2017) analysed the effects of the Natura 2000 programme, while Slee et al. (2015) examined the relationship

between climate change and funding. There are several studies focusing on the 2007–2013 programming period as well. Bonfiglio et al. (2017) focused on the programming period's knowledge transfer. Caruso et al. (2015) examined the effects of the so-called Measure 121 only, within the 2007–2013 period. Similarly to the present study, Pelucha et al. (2017) focus on comparing the results of the previous programming period and the 2007–2013 period. In their study, Furmankiewicz et al. (2016) aimed at examining the civil society, the relationship between LEADER funds and the third sector in the two programming periods. This article aims to fill the gap and contribute to research done in the field of rural development, comparing several programming periods (2002–2006 SAPARD and 2007–2013 National Rural Development Programme) and rural development measures in Romania.

The present research focuses on analysing the effects of successful applications on the indicators of the targeted areas (e.g. comparing tourism-based projects with tourism indicators or agriculture-based applications with agricultural indicators). Moreover, the research also examines whether the applications of the previous period have any effects on the applications of the current programming period. Another aspect investigated was the effects of successful applications on the development of the county, namely whether the county has experienced any progress compared to other counties.

Findings also highlight that there is a positive correlation between the number of previous applications (SAPARD applications before the accession) and the grant size of current applications. This is most probably the result of previous experiences and of the learning effect, i.e. those who learnt how to apply for smaller funds in the previous period applied for larger funds in the following period. Moreover, there is a negative correlation between the grant size of previous applications and the size of current applications – those who accessed larger grants in the first period were less likely to access such large funds in the next period. Cluster analysis revealed important social changes: on the one hand, the western counties of Romania (Bihor, Arad, Timiș, and Cluj) have strengthened their position, while lagging behind regions – although they successfully accessed SAPARD funds – could not gain any advantages/benefits as the grant size was not enough to overcome their economic conditions.

The present study aims to contribute to the above-mentioned research not only with its results but with the applied methodology as well. On the one hand, the research considers the applications of the previous programming period and, on the other hand, it takes a look at the effects of other types of rural development programmes and at whether such funding had any effect on the overall situation of counties.

The first section of the study provides a brief presentation of the relevant literature, followed by data analyses and results. Data analysis first introduces statistical data and then proceeds to present the results of the correlation analysis

– namely, whether accessing funds had any statistically relevant effects on the targeted areas and whether the results of the previous programming period had any effects on the current period. Correlation analysis focuses on whether accessing funds had any effects on the overall situation of the respective counties. The last section of the paper formulates the conclusions, recommendations, and possible directions for further research.

1. Literature Review

The present research focuses on accessing rural development funds as Romania is mostly made up of rural areas. 87% of the total territory of Romania is rural, and 45% of the total population lives in rural areas. Moreover, in some counties, the population is concentrated in the county seat, and the population density in other parts of the county is so low that the entire county is classified as a rural area. Therefore, the present study focuses on the quantifiable results of rural development programmes.

Rural development programmes generally aim to solve the characteristic problems of rural areas. These problems usually occur due to the isolation and reduced mobility of the population as a result of underdeveloped communication and transport infrastructure. Further characteristic of rural areas is limited economic opportunities due to low income, lack of capital, the small number of well-paid jobs, and increased dependence on agriculture. There are other demographic challenges as well such as the aging population and young people leaving the area. Young people often move away to avoid low-quality services and seek better job opportunities.

Rural areas present a complex challenge, and therefore they require complex solutions, the cooperation of several sectors, and a variety of financing programmes. The lack of capital in rural areas makes all kinds of financial aid very important – in many cases, this is the single most important factor in the development of the region. Rural areas in Romania receive a significant amount of funding within the rural development system and direct payments within the CAP. Regional operative programmes also grant funding to reduce disparities together with national funding schemes available for development.

Non-EU funding is characterized by political influence in many cases. Therefore, they are connected to election cycles. Implementation of projects usually occur two or three years after the elections because time is needed for political negotiations to take place between the government and their local political partners until public procurement procedures can finally start. Distributing non-EU funds by the government bodies could also be used to gain political leverage just for the upcoming elections. National funding therefore depends largely on the national

budget – so, there is a risk of suspending the project implementation if the budget deficit is high. Thus, local development projects include projects that could not access other (more secure) sources of funding and have a low chance to be influenced by politics (small repairs, renovation). First, it is useful to explain some particularities of the European Union rural development funding programmes that have significant influence on the present analysis. There is an ongoing delay between the planning and implementation of the EU rural development programmes. This phenomenon is similar to a sonic boom produced by an aircraft; however, I would describe it as a double planning delay. Rural Development programmes (and most EU programmes) are characterized by a duality, a delay on both the EU and country level. Development plans are always ahead of implementation. The gap between planning and implementation is increasing not only in time but also in execution. In other words, the results of the implementation differ from the original plans. The large EU system and the number of parties involved make the planning process time consuming; therefore, plans are made ahead of time, and they only consider the current realities and the foreseeable changes and needs of their respective time period. However, by the time of the implementation, global policy (e.g. unpredictable migration crisis), global economy (economic crisis), or social changes (unemployment among the young generation, increasing social gaps) might need different objectives and implementation programmes. The implementation of programmes is always slightly delayed since the new objectives require organizational restructuring, the development of adequate infrastructure, transmitting information to potential applicants, etc. Therefore, the implementation of programmes is behind schedule and is not always able to adapt to the real needs.

Operation of the EU funding system depends on the assessment of the results not only from a political perspective (visible effects of accessed funding) but beneficiaries also need to be able to experience the benefits of these programmes. The EU Commission has also realized the importance of result evaluation, and now the Directorate General for Agricultural and Rural Development is monitoring and assessing the results of rural development applications of the 2007–2013 programming period within the Common Monitoring and Evaluation Framework (CMEF). The CMEF includes preliminary, interim, and final evaluation reports. The importance of result analysis is also shown by the fact that the CMEF has been extended to include all the pillars of the Common Agricultural Policy, not only the second pillar, that is, rural development. However, the complexity of interventions, of rural areas and of the funding system requires further analyses besides the CMEF.

One of the major problems regarding result assessment is the partial lack of data; there are no sufficient or adequate data available (Bakucs et al., 2013; Desjeux et al., 2015; Slee et al., 2015; Kinsella et al., 2010). In many cases, the evaluation documents are written in the national languages, wherefore exchanging information and experience becomes limited. Another problem is that

the conclusions and recommendations of existing evaluations are not considered in the planning process of the next programming period (Andersson et al., 2017).

The overlap between funding schemes makes it difficult to separate the effect of individual funding sources, raising several problems of methodology. Many studies report about difficulties in separating effects (Bakucs et al., 2013; Wakeford, 2010; Michalek et al., 2012). Since rural areas and their development are complex challenges, some studies recommend using complex indicators that allow for the analysis of global effects (Bakucs et al., 2013; Michalek et al., 2012).

Another approach is to choose one type of funding scheme and focus on its effects. A good example is a study carried out by Bonfiglio et al. (2017), who focus only on the effects of knowledge transfer and innovation. Caruso et al. (2015) examine only the effects of Measure 121, while Furmankiewicz et al. (2016) analyse the effects of LEADER programmes on civil society. Sarvašová et al. (2017) chose to examine the effects of the Natura 2000 programme.

The Common Monitoring and Evaluation Framework (CMEF) is a common evaluation methodology combining quantitative and qualitative methods, used to assess EU rural development programmes within the 2007–2013 programming period. It is a complex system containing 160 hierarchical indicators (83 measuring outputs, 12 measuring results, 7 for the impact, 36 for objective-related baseline indicators, and 23 context-related baseline indicators) and 140 common evaluation questions. The advantage of the CMEF lies in its comparability and standardized form, which might be a disadvantage in certain cases as it might not consider the unique characteristics of projects. Most indicators are quantitative and are less concerned with the qualitative nature of project implementations (why and how).

A comparative study carried out by Terluin and P. Roza (2010) takes into account the CMEF and groups the impact studies of rural development programmes into 5 categories. The first category includes the CMEF used to analyse the impact of EU programmes – this involves both quantitative and qualitative elements. The second category includes the Tally approach, which simply counts the number of achieved objectives. The third is an econometric approach to efficiency analysis. The fourth relies on modelling when measuring impact, while the last one is a combination of quantitative and qualitative assessment in the form of a case study. The latter is thus capable of examining both direct and indirect impact.

Most of the impact analysis concerning the 2007–2013 programming period were produced after the period or much later since the impacts of the projects became visible and quantifiable only later (Andersson et al., 2017; Slee et al., 2015; Sarvašová et al., 2017; Furmankiewicz et al., 2016; Desejeux et al., 2015; Caruso et al., 2015; Bonfiglio et al., 2017).

The preconditions of a good evaluation are adequate time and available data but also the initial goal of the project. In the 2007–2013 programming period, sustainability was a strategic goal. In the case of rural development programmes,

a key performance indicator is sustainable growth, but the operationalization of sustainability and its measurement remain in the background, wherefore we have only a few studies on the topic. Sarvašová et al. (2017) set out to analyse the impact of the Natura 2000 programme. The Natura 2000 programme is concerned with the conservation of endangered species on EU territories; its main goal is the preservation of biodiversity. In some countries (Romania is not among them), territories participating in the Natura 2000 programme entitle the owners of the land to receive compensation for missed opportunities to generate income, and the study is concerned with the impact of these payments in 7 countries (Belgium, Hungary, Czech Republic, Germany, Slovakia, Greece, Lithuania). The study examines Measure 224, also known as Natura 2000 payments, using context analysis. Results of the study show that there are major problems with the implementation of Measure 224, the amount of compensation given, and the restrictions placed on owners show significant discrepancies. Contrary to initial expectations, only half of the forests and 1/3 of forest associations are eligible. Implementing countries spent 92% of their budget. Unfortunately, there are no data on the conservation of biodiversity, and therefore the study cannot report on that.

Slee et al. (2015) also analysed sustainability and environmental impact of the rural development programmes. Their paper examines the 2007–2013 EU rural development programmes and specifically their impact on climate change. The impact study has been conducted on the Scottish rural development programmes. According to the authors, measuring the effects of climate change in relation to rural development is in its early stages, and there is need for better measuring criteria as well as instruments that are necessary to analyse the effects of rural development programmes and climate change.

Rural development is closely connected to agriculture, and for this reason the agricultural sector also receives funding from rural development funds to develop farms, increase competitiveness, agricultural product processing, and environmental protection.

Desjeux et al. (2015) compare France and the Netherlands, analysing environmental protection funds and rural development funds given to the agricultural sector. They highlight the environmental impact farms have on the environment and biodiversity. The research compares two distinct periods: 2000–2006 and 2007–2013 on a national level and on the level of NUTS 2 development regions. The authors claim that certain programmes and payments have delayed effects, especially in underdeveloped regions (in the period of 2000–2006). In the 2007–2013 period, this effect can be felt on a national level.

Pelucha et al. (2017) also believe it is important to stress that rural development is still mostly focused on agriculture. The aim of their paper was to evaluate agricultural and non-agricultural funding between 2004 and 2013. The analysis focused on correlations and targeted agricultural lands and counties receiving

subsidies, comparing them with the characteristics of financed sectors. According to their results, there is no obvious correlation between the amount of financing and the socio-economic situation. Most of rural development policies are not in line with the socio-economic dimension of cohesion policy.

Furmankiewicz et al. (2016) also analyse the effect of rural development funds on non-agricultural sectors. Authors consider the civil sector to be of key importance in rural development, and for this reason it is interesting to examine EU funding sources for this sector and the effects thereof. One of the core elements of intrinsic development is the civil society, which is or would be capable of using local knowledge and resources. Authors have found that a certain part of EU funds, such as the LEADER programme, enable the involvement of the third sector in the decision-making process of local rural development. This effect has been shown by analysing two closed LEADER programmes (Poland's LEADER + Pilot programme (2004–2006) and the LEADER 4th Axis in Rural Development Programme (2007–2013)). There was a significant increase in the number of third-sector organizations thanks to these two programmes. However, receiving funds did not increase the influence of the civil society and its presence in local decisions and government.

The major objective of the 2007–2013 programming period was knowledge transfer and fostering innovation in rural areas. In line with the new trends, knowledge transfer and innovation are becoming more important in rural areas (sometimes only in theory), which might become an important factor in achieving sustainability. Innovative and knowledge-based sectors might have an advantage in rural areas. These sectors do not pollute the environment, have a high added value, and might retain the local young population and qualified workforce. In this context, we need to mention the study of Bonfiglio et al. (2017), who examine the spatial effect of knowledge transfer and innovation in the 2007–2013 period. They highlight the factors which had the most influence on accessing rural development funds. Their focus was on the differences between rural development programmes on NUTS 3 or county level. They observed a disproportionate concentration in favour of urban areas. According to the authors, this inequality comes from both top-down financing programme design and the ability to access funds (Bonfiglio et al., 2017: 83). Funding for knowledge transfer and innovation was concentrated in urban areas (in Romania, only Bucharest had a significant number of winning projects). Authors found positive correlation between grants received on knowledge transfer, innovation, and population density, but there was a negative correlation with the size of agriculture. Based on their findings, the authors suggest that those regions (counties) that are most in need of knowledge transfer and innovative investments chose to invest in less innovative, short-term measures, resulting in counterproductive outcomes. In other words, rural areas will become less innovative, and the gap between urban and rural areas will continue to grow.

Several papers formulate recommendations for the CMEF. One of them suggests that it would be important to pay attention to spatial effects as well as national, regional, and local particularities; furthermore, complex indicators may make evaluation easier (Desjeux et al., 2015; Slee et al., 2015; Bakucs et al., 2013). According to Slee et al. (2015), CMEF work with unreliable indicators as far as land use and climate change are concerned. Their recommendation is that we could improve the measurement of climate change. They suggest that we could measure the effects of land use and greenhouse gas emission with the help of new indicators such as emission per household or emission per output unit.

Andersson et al. (2017) analyse whether impact studies and result evaluations had any effect on future rural development policies, on planning the next programming period and whether impact studies had any influence on regulation. Their results show that although the EU Commission is convinced of the importance of evaluation in rural development, the results somehow failed to influence the planning of the next programming period (this is true for both national programmes and regulations which seem to change under external pressure). The authors believe that this might be possible due to the vagueness of recommendations and inaccurate feedback. On the other hand, many studies are written in the national language of member states, which makes knowledge sharing more difficult.

In conclusion, it can be said that several studies have been conducted on the topic of accessing rural development funds, but in order to fully understand their impact we need further studies over longer periods of time and more complex methodology. In what follows, the paper presents the research methodology and the results of the current study with the hope that they might contribute to the previously described line of research.

2. Materials and Methods

Data and Methods of Analysis

The present study includes the analysis of two periods of rural development data available for Romania, on a county basis. On the one hand, it analyses data referring to the period of the Special Accession Programme for Agriculture and Rural Development (SAPARD, 2002–2006); on the other hand, it deals with the data of the first half of the first Rural Development programming period, i.e. 2007–2012. (The official EU programming period was planned between 2007 and 2013; however, Romania was among the “N+2” countries, meaning that they could implement and account for rural development funds by the end of 2015. Therefore, the year 2012 can be viewed as an interim period.) The dataset consists

of data referring to the applications in both periods (the number of applications and the amount of required grant for each call for applications), demographic and economic data on county level (GDP, no. of active companies, etc.), data referring to those sectors which were affected by the applications (tourism, agriculture), and some data on the infrastructure. The exact year of closing the application is unknown, only the end of the programming period, wherefore indicators are calculated for a period of time, using either periodical average or calculated changes within a given period. Data come from the Romanian National Statistics (INS) website and the official website of the Ministry of Agriculture and Rural Development and Regional Development Agencies. In what continues, the results will be presented according to the different methods of data analysis – first presenting the results of the descriptive statistics and then the findings of the correlation analysis followed by the cluster analysis.

3. Results and Discussion

Descriptive Analysis

The aim of the present paper was to examine who are the winners of rural development applications and who are those who have failed to win.

Table 1 contains relevant data – according to the number of applications, Călărași submitted the lowest number, while Alba County submitted the highest number of applications. Cluj County received the highest amount of funds, while Covasna County received the lowest amount. The per capita distribution of the funds was the highest in Bistrița-Năsăud County and the lowest in Bacău County. If we look at the data, we can see some differences. Those who submitted the largest amount of applications submitted ten times more than those on the lower end of the spectrum. However, if we look at the sum of the money granted, the difference is only 3.7-fold, and the per capita distribution is higher in the case of those who submitted less applications.

Table 1. *Rural development applications submitted in Romania between 2007 and 2012*

	Minimum value/county	Maximum value/county	Max./Min. coefficient	County average	St. deviation
No. of applications	428	4,561	10.7	1,541	915
Value of applications (EUR)	55,325,733	205,283,378	3.7	117,041,322	40,790,054
Value of applications/capita	106	557	5.3	255	111

Source: own elaboration based on data retrieved from the National Institute of Statistics (INS) and the Regional Development Agency

The table above should be completed in the future with values referring to the per capita distribution of the funds in the case of rural inhabitants as this indicator would show us the differences that emerged among those affected.

Results of the Correlation Analysis

Correlation analysis was used to investigate and to answer the following research questions and hypotheses:

H1: There should be some correlation between the results of the first programming period and the results of the current programming period.

RQ1: What is the relationship between SAPARD and Rural Development programmes?

H2: The received rural development funds must have had an effect on the target regions.

RQ2: Are the effects of rural development funds visible in the respective target regions?

Correlation is used to measure the strength and direction of the relationship between variables. Linear correlation shows the relationship between two variables and the correlation coefficient has to be between -1 and 1. The stronger the relationship between the variables, the closer will be the value to -1, and whether it is minus or plus reflects the direction of the relationship.

A value above 0.7 means a strong relationship, values between 0.2 and 0.7 are considered to reflect a relationship of medium strength, while values below 0.2 show a weak relationship between variables. The squared correlation coefficient (also called R squared) denotes the coefficient of determination, which shows the proportion of the variance in the dependent variable that is predictable from the independent variable.

For testing the first hypothesis, I examined the correlation between the number of submitted applications, the received amount of funds, and the per capita distribution of funds in the case of both the SAPARD and the rural development funds. There seems to be two, not very strong relationships – on the one hand, there is an inverse relationship (negative correlation) between the received amount of SAPARD funds and the per capita distribution of rural development funds. I believe this might be the result of the fact that during the SAPARD programming period the largest amount of funds were received by the large rural infrastructure projects; therefore, if a county had implemented more projects of this kind, then most probably at the beginning of the following programming period they could not apply for such big funding, and so the per capita distribution of the funds is lower.

The positive correlation between the number of submitted SAPARD applications and the received amount of rural development funds shows the “learning” effect – namely, in those counties where they learned how to apply for projects starting

with a smaller amount of funds, by the next programming period, they would have learnt how to write adequate applications and received a larger amount of funds. Therefore, it can be said that the first hypothesis has been validated. There is indeed an observable relationship between the first programming period and the following one; however, this relationship is rather weak.

Table 2. *SAPARD projects and Rural Development projects – correlation coefficient*

		Value of rural development applications	Value of rural development applications/capita	No. of rural development applications
Value of SAPARD applications	Pearson correlation	.225	-.343 [*]	-.075
	Sig. (2-tailed)	.163	.030	.646
Value of SAPARD applications/capita	Pearson correlation	-.084	.203	-.036
	Sig. (2-tailed)	.608	.209	.825
No. of SAPARD applications	Pearson correlation	.346 [*]	-.177	-.080
	Sig. (2-tailed)	.029	.276	.623

Source: own elaboration

The second hypothesis refers to the changes that can be observed within the target region or economic sector as a result of accessing development funds. In the case of infrastructure projects, the relationship between the number of projects, received funds, and the value of projects/capita and the changes in modernized roads, water supply network, and sewerage network was examined.

There is a strong correlation between the number and value of infrastructure projects and the length of modernized public roads. This is the result of large infrastructure projects submitted in this programming period and used for modernizing and mending roads. It is interesting that there is no strong correlation between changes in the sewerage network and the value of projects per capita. What is more, water supply network does not even appear in the statistics though it is usually constructed together with the sewerage network. I believe there are two explanations for this situation: on the one hand, in most cases, the water supply network was constructed in the first programming period, and the number of those constructed later is not significant. On the other hand, in most cases, complex projects were submitted for the renewal and modernization of the water supply network, but this change does not appear in the statistics as the size of the network did not extend.

Table 3. *Correlation between infrastructure projects and infrastructure indicators*

		Length of public roads average 2007–2012	Length of sewerage network changes 2007– 2012
No. of rural infrastructure projects	Pearson correlation	.466**	.199
	Sig. (2-tailed)	.002	.219
Value of rural infrastructure projects – EUR	Pearson correlation	.444**	.228
	Sig. (2-tailed)	.004	.157
Project value/capita – EUR	Pearson correlation	.257	.347*
	Sig. (2-tailed)	.110	.028

Source: own elaboration

Statistical data referring to tourism projects shows interesting changes, i.e. in case of many counties there is a dramatic decline in tourist accommodations. These data clearly reflect the process of market clearing and changing, meaning that the old socialist accommodation types (camping and hotels) are slowly replaced by new types of accommodations in a totally different hospitality system such as pensions or holiday chalets (data on latter is usually missing from statistical databases). As it can be seen from *Table 4* below, this effect was adequately balanced by the implementation of several projects. Thus, it can be said that there is a positive relationship between the number and value of the projects and the number of tourist accommodations, but the decline in accommodation could not be stopped or reduced (it was not necessary because of the transformation of market demands). However, data also shows that within the examined period these implemented projects and the growth in the number of accommodations did not result in the increase of nights spent. This can be explained by the assumption that implementing these projects only expanded the accommodation facilities, but touristic programmes and other important services did not extend.

Table 4. Correlation between tourism projects and relevant indicators

		Tourist accommodation establishments – average 2007–2012	Tourist accommodation establishments – changes 2012–2007	Accommodation capacity – average 2007–2012	Accommodation capacity – changes 2012–2007	No. of tourism nights spent – average 2007–2012	No. of tourism nights spent – changes 2012–2007
No. of tourism projects	Pearson correlation	.323*	.408**	.004	.258	.098	.152
	Sig. (2-tailed)	.042	.009	.980	.109	.546	.348
Value of tourism projects	Pearson correlation	.308	.405**	.002	.255	.099	.137
	Sig. (2-tailed)	.054	.009	.992	.112	.541	.400

Source: own elaboration

For what regards agricultural funds, I examined the changes in the case of all types of livestock, agricultural lands, or machinery, but very strong positive correlation was found only between one type of livestock and the value of agricultural funds. However, it needs to be mentioned that such strong correlations are the result of not only the rural development funds but also of other agricultural subsidies.

Table 5. Correlation between agricultural funds and relevant indicators

		Agricultural land – average 2007–2012	Cattle population – changes 2012–2007	Tractor, agricultural machinery – average 2007–2012	Value of agricultural production – average 2007–2012 (thousand RON)	Value of agricultural production – changes 2012–2007 (thousand RON)	Value of crop production – average 2007–2012 (thousand RON)
Value of agricultural projects – EUR	Pearson correlation	.647**	.142	.582**	.498**	.572**	.544**
	Sig. (2-tailed)	.000	.383	.000	.001	.000	.000
Value of agricultural project/farm	Pearson correlation	.384*	.520**	.251	.104	.391*	.160
	Sig. (2-tailed)	.014	.001	.118	.523	.013	.323

Source: own elaboration

A similar analysis on agricultural funds was carried out by Caruso et al. (2015), who compared the region of Apulia in Southern Italy and Lithuania in the 2007–2013 period. They were interested in Measure 121 of the rural development

programme and examined the effects of these rural development programmes on the regional and national agricultural system. Their findings show that in the case of Lithuania the large number of smaller projects led to a more uniform development helping entrepreneurs, while in Italy larger projects won the funding.

In the case of the present research, both hypotheses have been validated; correlation can be found in both cases but in a very different direction. The strongest relationships can be found between the value of agricultural funds and agricultural indicators; however, this strong relationship is not only the effect of rural development funds.

Cluster Analysis

Cluster analysis is a dimensional reduction process that results in the observation being grouped into similar groups (Sajtos–Mitev: 283, Székelyi–Barna: 109). As a result of the analysis, the observed units are divided into homogeneous, very similar groups, and the groups are clearly distinguishable from each other.

Cluster analysis is used to test the following hypothesis: counties with similar characteristics show similar performance in accessing funds. The study set out to examine the following research questions: in what categories can we include the counties? What similarities are there between well-performing and poorly performing counties? Is there any change compared to the first programming period?

Sajtos–Mitev (284) draws our attention on some limitations of cluster analysis:

– In this case, there is no single good solution (belonging to the cluster depends on the chosen method). I tried several procedures until I got a meaningful result. Bakos et al. (2014) used factor and cluster analysis to compare rural development programmes in Romania and Hungary. Their results show that there is a correlation between the GDP of a county and the received amount of funds (this correlation is even stronger in the case of Hungary). They identified two factors: amount of funding for a certain agricultural activity and funding per population. These factors were used in the cluster analyses. The clusters identified in Romania are more difficult to explain, and in my opinion the authors have failed to identify clusters that correspond to reality. Therefore, I believe they should have introduced other indicators as well, as it will be shown later.

– The emerging segments are not independent of the observed database order (323–324), and I received different clusters by changing the order of data.

– As a result of the analysis, clusters will always be created, even if this cannot be identified and cannot be evaluated in the actual dataset.

– It is very important to have relevant and theoretically justifiable variables in the dataset as this determines the results. I had tried many indicators and

verified (cleaned) indicators until I arrived at the best explainable cluster with the following indicators: value of funds, number of projects, number of unemployed people, number of active companies, size of agricultural land, number of rural population, and GDP/capita.

When looking at the outliers within the dataset, it could be observed that Bucharest and Ilfov counties differ from all other counties in many aspects. Since it is an economic and social agglomeration, every indicator of it can be double or even triple of the other examined counties (GDP, number of population, rates of payments, etc.), but this area cannot be said to be rural, and so it is not the target area of rural development resources. Therefore, these counties are not relevant from the perspective of this study either. Thus, Bucharest has been eliminated from the database to avoid any distortion of the values. Similarly, Ilfov County is not a rural area and shows very different data.

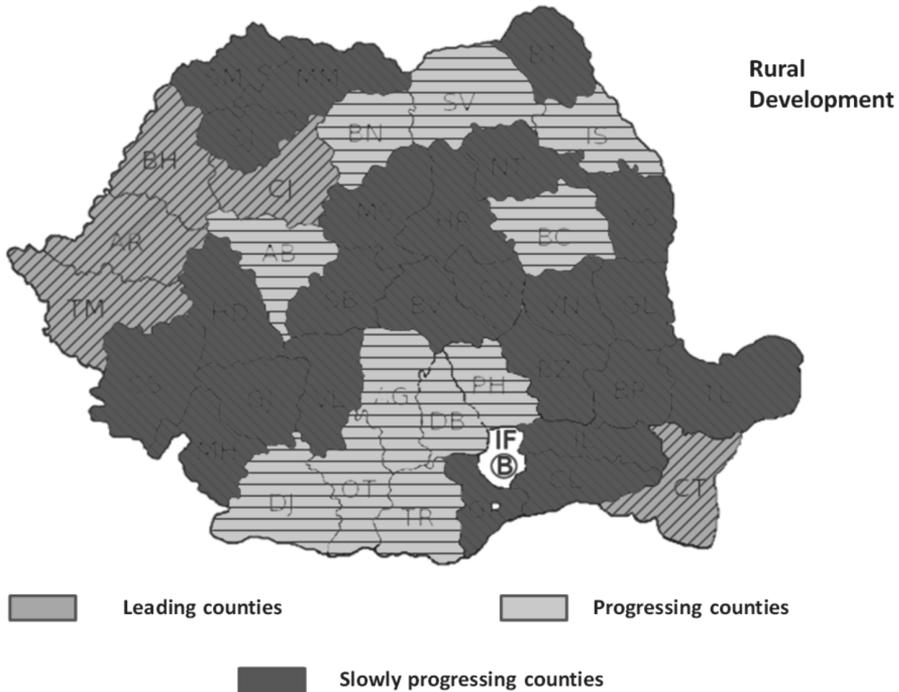
If the data shows different values, it is necessary to standardize, meaning that the average is subtracted from each of the values, and then the difference is divided by the standard deviation (the average of the standardized scale is 0, its standard deviation is equal to one, the positive values are above average, and the negatives are below average). There was a need for standardization in our database as well. To what extent do the variables of the study correlate? In this case, it is important to filter the variables with very high (above 0.9) correlation coefficients since the combination of the two leads to distortion (Sajtos: 289). By checking this condition, I performed the cluster analysis. I used K-means cluster analysis, while the variance analysis showed the indicators to be appropriate for the examination.

Table 6. *Cluster analysis – ANOVA*

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Z score: no. of projects	4.131	2	.831	37	4.973	.012
Z score: total value of projects	9.649	2	.532	37	18.121	.000
Z score: no. of unemployed	5.362	2	.764	37	7.017	.003
Z score: no. of active comp	9.986	2	.514	37	19.418	.000
Z score: size of agr. land	8.205	2	.611	37	13.439	.000
Z score: GDP/capita 2007–2012	7.791	2	.633	37	12.308	.000
Z score: no. of rural population	7.911	2	.626	37	12.629	.000

Source: SPSS table of results

Clusters have been created after four repetitions, and they were entitled as follows: leading, progressing, and slowly progressing counties.



Source: own elaboration

Figure 1. *Distribution of clusters in the case of Rural Development projects*

1. The 11 counties within the progressing category could be characterized as medium-developed counties and as good applicants.
2. The 5 leading counties are actually developed counties and efficient applicants.
3. The cluster of slowly progressing counties includes 24 members and is made up of economically disadvantaged and inefficient applicants who did not perform well in accessing funds.

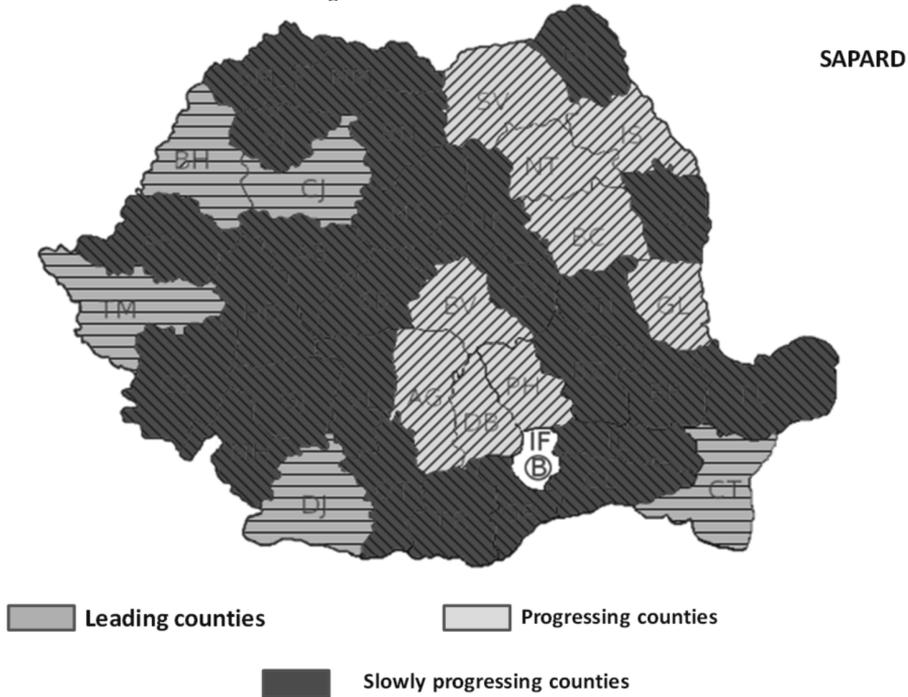
The characteristics of the leading counties are the following: they performed the best regarding the value of the projects; they achieved good results in the number of projects; the number of rural population and the unemployment rate shows medium values. Here can we find the largest number of active companies, the highest GDP/capita, and the biggest sizes of agricultural land.

The characteristics of progressing counties: they are the best regarding the number of projects; however, the unemployment rate and the size of the rural population is high, and they achieved medium values regarding the total value of projects, GDP/capita, and the number of active companies.

The slowly progressing counties fall behind all aspects and categories. We can find Braşov and Sibiu counties in this cluster; however, from an economic

perspective, they should belong to a cluster with better results – the only possible explanation could be their poor performance in accessing funds.

Using the same indicators, the cluster analysis has been run on the SAPARD data as well, and similar changes could be traced.



Source: own elaboration

Figure 2. Distribution of clusters in the case of SAPARD projects

In the case of SAPARD data, the leading counties had the greatest number of projects and showed good economic indicators. The progressing counties have efficiently accessed big funds with greater values and their economic indicators show medium values. Slowly developing counties include those counties which performed poorly in accessing funds and they were also economically lagging counties.

Map names and cluster accuracy are not the best, but the difference between the two maps captures a very important social transformation/change: on the one hand, we can see the strengthened position of the western counties (Bihor, Arad, Timiș, and Cluj), while at the same time those counties which managed to effectively access funds could not gain any significant advantages as the value of the grant was not large enough to overcome the existent economic conditions.

4. Conclusions, Recommendations, and Future Prospects

In conclusion, it can be said that accessing rural development funds and their effects could be analysed using the methods presented above (descriptive statistics, correlation and cluster analysis). Based on the above analyses, we were able to identify some explanatory factors. Unfortunately, some factors have imposed limitations on the analysis such as lack of data, no knowledge of the projects' initial objectives, results, start and completion date, incompleteness of related statistics, and their not being updated in due time. The complexity of the research setting, of rural areas is another source of complication.

Furthermore, we cannot separate the effects of other projects and programmes which have overlapping objectives (National Local Development Programme, Regional Operational Programme, etc.). Therefore, in future research, it would be interesting to compare different funding sources and data. It is possible that accessing local development funds and EU funds are negatively correlated, but validating such hypothesis would be the topic of another research.

Based on the results, it can be said that if we only consider the results of descriptive statistics we can notice a significant difference among the counties' ability to access EU funds. The most successful county accessed five times more funding than the least successful one. Further analyses should also include a per capita amount of funding received. This indicator would point out the differences between target group members. It would also be interesting to compare the present results with those obtained after the end of the programming period because experience shows that towards the end of the programming period there is a greater interest in submitting project applications, and hence there is an increase in the number of successful projects. In the next stage of the research, we could analyse available local funding and their cycle – this would allow for a more precise description of the effect of rural development programmes.

Based on the correlation analysis, we can see that agricultural funds had the most significant impact (even though there is a significant proportion of land-based funding and other agricultural funds which had a greater effect since they provided farms with larger grants). In the case of agricultural funding, there is a positive correlation between changes in livestock (cattle), agricultural production, and the number of tractors and other farm machinery. The effect of funding can be felt in tourism as well (there is a noticeable correlation between successful projects and the number of hospitality units), but a stronger effect and more positive correlation is to be expected in the future. In the case of infrastructural development projects, the effects are already visible and there will not be any significant changes at the end of the programming period. There is an interesting connection between the results of the current programming period and the results of the SAPARD projects in the previous period before the accession. This

can be explained by a learning effect – those who submitted more applications in the previous period were now able to access funds for larger projects. It is also interesting that there is negative correlation between the size of the projects in the previous period and the number of projects submitted in the current period. Probably, those who applied for larger grants in the previous period did not apply for large grants in the current period.

The results of the cluster analysis show that successful projects had a positive influence on certain counties (mostly western counties such as: Arad, Bihor, Timiș, and Cluj), while others missed this opportunity. It would be interesting to examine these results at the end of the programming period and maybe find more appropriate cluster names.

All in all, results show the positive changes of EU Rural Development projects and the development of targeted areas in Romania. However, the western counties of Romania were able to make better use of the obtained funds and thus were able to achieve better general development.

Recommendations:

– In order to avoid or reduce problems caused by the double planning delay, a part of the available funds should be withheld to cover unpredictable changes, to allow for a more flexible adaptation, and to focus more on specific local needs.

– The agricultural dependence of rural development could be reduced by measures aimed at the general development of rural areas, which help rural areas in accessing and using new forms of knowledge (such as IT skill development for the elderly or for those who need it, IT-based social reference services, etc.).

– In the case of poor, lagging settlements, a better development could be achieved with the support of a local development and programme-planning specialist, who would only deal with the planning, preparation, and submission of EU projects. However, it would also be important that this specialist be employed not by the local councils but work on behalf of an EU agency as poor settlements could not afford to hire an appropriate specialist at their own expense.

Some further steps of the present research might include analysing longer programming periods and comparing the results obtained with other development funds (local development funds, Regional Operative Programme). Background factors that influence settlements' abilities to access funds could be analysed by comparing groups of settlements that were able to win a lot of projects and another group of settlements who were not successful in accessing EU rural development funds.

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