

## MANAGERIAL APPROACHES OF ENVIRONMENTAL PROJECTS: AN EMPIRICAL STUDY

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**Abstract:** The accession of Slovakia into the European Union significantly supported the possibility to participate in financial programs focused on different areas of social and economic spheres, financed substantially from EU sources. One of the subsidy areas has been the environmental protection. Due to the specifics of environmental projects, the irretrievable disposition of this financial aid is inevitable in many cases. This article analyses the spatial distribution of environmental projects financed from relevant subsidy schemes in individual regions of Slovakia. We can recognize that there is no significant close correlation between the economic development of a territory and the support through implemented projects.

**Key words:** cluster analysis, cophenetic correlation coefficient, environmental projects, regional differentiation, structural fund, sustainable planning

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### Introduction

Global climate change is one of the greatest economic and social problems in the foreseeable future. These considerations motivate expanding interests between the environmental regulation and industry competitiveness, as well as the corporate social responsibility (Amore and Bennedsen, 2010). Cihelkova (2012) argues that the economic system is often beyond the limits of the ecological system, and thus leads to irreversible changes and environmental degradation. If living conditions are to be preserved for the future, development of the world economy must be sustained. The objective of environmental management is to maintain the quantity and improve the quality of natural resources, and therefore to ensure a sustainable development of the society. According to Huttmanova (2015), the current requirements regarding the economic and social development are directed at sustainability. The sustainable development is considered to be a multidimensional concept, wherein the quantification is quite difficult. Daneshpour (2015) argues that sustainable development has been incorporated into various levels of society in the recent years, and projects are important instruments that make significant

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influence on sustainable development. Sustainability is rather a continuous path to transformation, which should have an influence on the value systems. Therefore, discussions on sustainability require interdisciplinary approach and allow consideration of different perspectives. Sustainability brings together at least three different "disciplinary" perspectives; system innovations, management of natural resources and environmental education. Each of them offers a special attitude to learning, change processes and understanding of sustainable practices (Wals and Rodela, 2014).

Nahtigal (2013) argues that the European crisis has pointed to numerous deficiencies in the existing European institutional structure. One of the major deficiencies is the unsustainable regional disparity among the most developed European regions and those lagging behind. This model generates an unsustainable development pattern for the future development of the European Union.

The gap between the advanced entities of the society with access to up-to-date knowledge, skills, technologies and other resources and those lagging behind is growing, even in developed regions of Europe. The issue of regional development, especially in the context of regional disparities is a subject to discussion in different spheres of the society, and it is one of the most serious problems in broader European context. Leaders of the European Union aim to address this issue actively, which can be also manifested by the fact that one of the pivotal long-term and ongoing goals of the EU regional policy is to combat regional disparities. This issue has become discussed by the scientists as well. It was the scientific analysis of regional disparities that not only identified these disparities and their extent, but also drew attention to their origins, impact and multidimensional character (Stanef, 2012; Zdrzil and Applova, 2016). According to Pavolova et al. (2014), the environmental quality is in interaction with the overall level of regional development. It is also the interest of the EU to provide possibility for non-repayable funds for individual projects of the Operational Programme Environment, in order to improve the environmental situation through reduction of the environmental burden in particular regions. According to Stefko et al. (2010), an increased attention is given to projects and possibilities of financial assistance under the EU regional policy - in order to support significant changes, especially in funding and subsidising important projects and innovation in the regions lagging behind.

Inconsistent environmental planning causes an increase in ecological debt of the society. Jenicek (2013) says that the planet, which ecological footprint is bigger than its biological capacity lives at an ecological deficit. Ecological deficit emerged for the first time in the second half of the 80s and it has been growing ever since. The individual countries contribute to ecological deficit in a different way. The ecological debt of Slovakia is estimated to be 130 billion SKK (Majernik et al., 2007). According to Warlenius et al. (2015), the concept of ecological debt emerged in the early 1990s within social movements, driven by growing awareness of the environment. Since that time, this issue has attracted the attention

of the academic field and international negotiations about the environment. Now, the concept of ecological debt requires further clarification and processing, especially with regard to historical relations to environmental justice. One of the possible instruments of its reduction might be achieved through implementation of various environmental projects with a help of the EU structural funds.

As for the environmental projects, only the pre-accession period is considered to be closed. Projects of the shortened programme period are mainly in their implementation stage with expected results not fully manifested. Projects of the current programme period have only started. According to Zvingule et al. (2013), this limitedness of resources requires the maximum possible effectiveness of their utilization. Financing of environmental activities through projects is a broadly applied mechanism in environmental governance, targeted to improve environmental conditions. In order to make progress in environmental field, many projects are implemented – both of technical nature in form of transfer from old to new technologies) and related to ‘soft’ assistance (projects that are designed to increase public environmental awareness and responsibility).

The intent of the structural and regional policy of the European Community is to balance differences between the rich and poor countries in scope of the united Europe. This policy of the European Union is characterized by providing financial aid to regions that are economically and socially underdeveloped and do not reach the expected level. The European Structural and Cohesion Fund aims to reduce social and economic disparities between the European regions. Due to several tens of thousands of projects supported within a programme period, it is difficult to find coherent evidence about the output and results of the EU regional policy (Bahn-Walkowiak et al., 2012).

Slovakia joined the European Union in 2004 together with nine other candidate countries. Since the programme of subsidizing marginal areas in the EU is established for several years in advance, countries joining the EU in 2004 entered the period that ended in 2006. This is the reason for labelling this period between joining of the EU until 2006 as the shortened programme period. During the shortened programme period of 2004-2006, the support of underdeveloped regions in Slovakia was implemented through four structural funds and the Cohesion Fund. Even in the pre-accession period Slovakia had an opportunity to gain financial support from the pre-accession programs of ISPA, Phare, and Sapard, focusing on support of environmental projects.

To benefit from financial support of the EU structural funds in the shortened programme period, Slovakia had to have a National Development Plan (Kotulic, 2011; Kravcakova Vozarova and Kotulic, 2016). The National Development Plan was implemented through Operational Programs (OP). According to Baresi et al. (2017), clear and effective legislation is a prerequisite for sustainable development. The largest and most important fund was (and still is in the current programme period of 2007-2013) the European Regional Development Fund. This fund among others focused on protection and improvement of the environment and energy

production, based on renewable resources. This has been realised through the fund's keynote documents – Operational Programs (Basic Infrastructure – OP BI and Industry and services – SOP IS).

The European Agricultural Guidance and the Guarantee Fund focused on improvement and support of the agricultural competitiveness. Apart from the support of diversification of agricultural operations in rural areas, it supported projects in the field of improvement of the country's environment. It is divided into two sections – guidance and guarantee. The financial resources of the guarantee section were based on the programme document of the Rural Development Program (RDP); the financial resources of the guidance section were based on the programme document the Sectoral Operational Programme Agriculture and Rural Development (SOP ARD).

Other structural funds provided only a complementary support of environmental projects. Individual structural funds through various operational programs supported a vast scale of environmental projects with a significantly differentiated group of legitimate applicants. Since the scale of financial participation of individual applicants on projects, as well as the fact that many projects are still being realized, the overall summary of the success and effectiveness of the use of funds is currently problematic.

The result of national efforts for a specific form of environmental protection is the Environmental Fund (EnviroF). It was created by an act based on the dissolved State Fund of the Environment, and financed the first project in 2005. The second important protection scheme financing environmental projects not only through domestic, national resources is the Recycling Fund (RecF).

The environmental project financed from public funds is a tool to reduce environmental disparities. Since it is a project in a general context, it should (based on principles of the EU cohesive policy) contribute to reduction of regional economic disparities.

The aim of this paper is to assess the impact of the environmental projects aimed at reducing economic disparities with the help of financial support at NUTS III level in the monitored period. This very specific issue fills a gap in the field of research for the reviewed period that was specific for integration processes related to accession of the Slovak Republic to the European Union.

We can assume that one of the possibilities to reduce regional disparities is the financial support of the marginalized areas. In this paper we do not take into consideration the specifics of regional disparities (economic, environmental, social or other), and we also do not focus on the nature of marginalization. For this reason, the financial support for projects should solve all kinds of regional disparities. In this case, we detected a statistically significant relationship between the degree of support for environmental projects and the economic development of the regions.

Economic development of the region can also be the result of activating local leaders, communities, public administration, local government, as well as

the business circles. A higher level of activation is immediately reflected in higher level of economic development of the region, and indirectly it results in higher interest in solutions to existing problems in the region. The regional economic disparities are caused by different economic performance of the regions. Economically more developed regions are expected to have more developed environmental infrastructure. This means that more developed regions will participate less in environmental projects, which are aimed to reduce regional disparities.

We can detect statistically significant differences in the number of environmental projects between groups of economically more developed and less developed regions. In other words, we also recognise statistically significant differences between the volume of financial resources for environmental projects received by economically more developed regions, and the volume of financial resources for environmental projects received by economically less developed regions. The confirmation of these hypotheses would mean that higher support for environmental projects is directed to regions that are economically less developed.

### **Material and Methods**

This article evaluates whether the amount of subsidy for environmental projects on regional level was more focused on regions that are characterized by lower level of economic development. Furthermore, this article analyses the environmental projects, and subsidies obtained by individual regions of Slovakia (at the level of NUTS 3). The similarity of individual regions based on selected parameters is described through methods of cluster analysis. We detected a close correlation between the economic development of the territory and the measure of support through implemented projects. This analysis did not confirm our assumption.

The material for analysis was comprised of information on subsidized projects according to individual operational programs of the shortened programme period (2004-2007). This very specialized issue fills a gap in the research field for the period specific for integration processes related to the accession of the Slovak Republic to the European Union. The information was gained from official, publicly accessible sources. Since overall statistical results on subsidized environmental projects cannot be found, the result summary is obtained through gradual analysis of all subsidized projects. Projects that are of uber-regional character or their character did not allow them to be matched to an individual region were excluded from the list of environmental projects. The schemes, not valid for the entire territory of Slovakia (JPD Bratislava, Interreg and Neighbourhood Program) were also excluded. The remaining group of projects was divided according to regions in which they were implemented. This resulted not only in an overall number of projects for individual regions, but also in overall amount of subsidies gained to support such environmental projects.

The cluster analysis made it possible to make distinction between economically developed and less developed regions. Parameters for the composition of clusters

were: the amount of GDP per inhabitant, the level of unemployment, the net income of employees, the level of foreign direct investments, the number of natural entities, the number of legal entities, the revenue of wholesale and retail trade. All these criteria represent the final values for individual regions and were obtained from official data of the Statistical Office of the Slovak Republic. The average results of the last four years are used.

The quality of the cluster was verified by the cophenetic correlation coefficient. The cophenetic correlation coefficient CC is a Pearson correlation coefficient between the actual and the dendrogrammatic predicted distance. It is calculated as below:

$$CC = \frac{\sum_{i < j} (x_{(i,j)} - x)(t_{(i,j)} - t)}{\sqrt{\sum_{i < j} (x_{(i,j)} - x)^2 \sum_{i < j} (t_{(i,j)} - t)^2}} \quad (1)$$

where:  $x_{(i,j)}$  – the ordinary Euclidean distance between the  $i$ -th and  $j$ -th observations,  $t_{(i,j)}$  – the dendrogrammatic distance between the model point  $T_i$  and  $T_j$ .

Clusters accepted as suitable were those with the value of cophenetic correlation coefficient over 0.75. The second criterion quantifying the cluster quality through the “closeness” of grouping is the Delta  $\Delta$ . The characteristics are calculated as below:

$$\Delta_A = \left[ \frac{\sum_{i < j}^N |d_{ij} - d_{ij}^*|^{1/A}}{\sum_{i < j}^N (d_{ij}^*)^{1/A}} \right]^A \quad (2)$$

where:  $d_{ij}$  - the interval in original interval matrix,  $d_{ij}^*$  - the interval in dendrogram,  $A = 0,5$ , or  $1$ .

Close to zero value of  $\Delta$  is required for the quality of obtained clusters. The cluster analysis was made by a pilot test version of the NCSS 2000 statistical software.

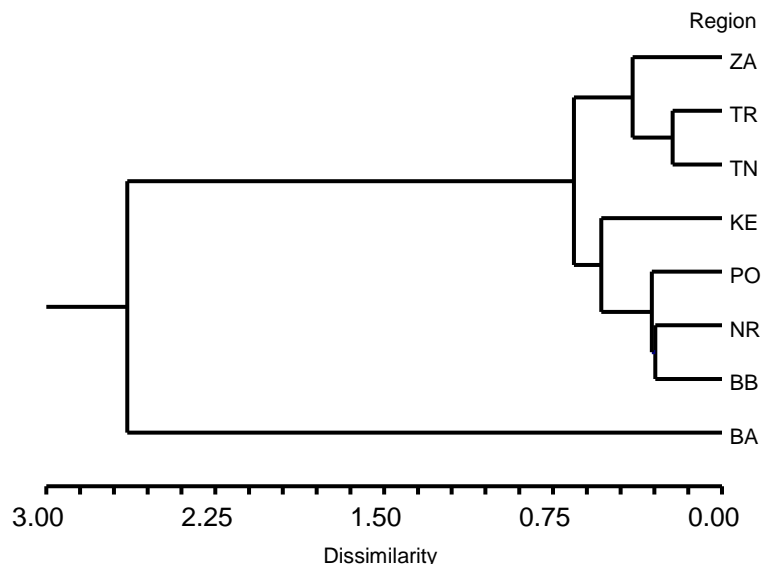
After obtaining clusters of regions, parameters for the number of projects and the volume of subsidies according to individual support schemes of the regional clusters were studied. The standardization of parameters of regional clusters was reached via recalculating the gained parameters per inhabitants of regional clusters, the unit of the area of the cluster, and the unit of the influenced area (IA) of regional clusters.

Following the preparatory calculation, the verification of whether the cluster of economically more developed region receives more subsidies than clusters of economically less developed regions was performed.

As the hypothesis test did not confirm the abnormality of the division, we applied the Mann - Whitney U test. Similar statistical methods are used by Tej et al. (2014), Vavrek et al. (2015), Vavrek et al. (2017) or Sira et al. (2017).

### Results and Discussion

Results based on selected economic criteria are presented in the following dendrogram (Figure1).



**Figure 1. Clustering of Regions based on Economic Performance (Dendrogram)**  
 (ZA = Zilina region, TR = Trnava region, TN = Trencin region, KE = Kosice region, PO = Presov region, NR = Nitra region, BB = Banska Bystrica region, BA = Bratislava region)

The cophenetic correlation coefficient  $CC = 0.98966$ , as well as Delta parameters (Delta (0.5) = 0.08902, Delta (1.0) = 0.09443) show high quality of obtained clustering. Zilina, Trnava and Trencin regions represent one group of regions, while Kosice, Presov, Nitra and Banska Bystrica represent the second group. The studied results show that the first group represents the economically more developed regions, while the second group is represented by economically less developed regions. Bratislava region represents a special case, which can be seen on the length of the dendrogrammatic distance.

These significant differences of Bratislava region resulted in the exclusion of this region from further analysis. The summary of subsidized environmental projects is presented in following Tables 1 and 2.

**Table 1. The Number of Subsidized Environmental Projects in Regional Clusters**

	NP		NPI		NPL		NPIA	
	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB
Phare	31	47	16,7	16,0	2,0	1,5	45,4	12,3
ISPA	12	12	6,5	4,1	0,8	0,4	17,6	3,1
Sapard	11	14	5,9	4,8	0,7	0,4	16,1	3,6
OP BI	49	102	26,5	34,8	3,2	3,2	71,7	26,5
SOP IS	19	25	10,3	8,5	1,2	0,8	27,8	6,5
SOP ARD	21	56	11,3	19,1	1,4	1,8	30,7	14,6
RDP	292	604	157,9	205,9	18,9	19,2	427,3	157,2
EnviroF	498	1445	269,3	492,6	32,2	45,8	728,7	376,0
RecF	121	189	65,4	64,4	7,8	6,0	177,1	49,2

NP - Number of projects, NPI - Number of projects per 1 mil. of inhabitants, NPL - Number of projects per 1000 km<sup>2</sup> of land, NPIA - Number of projects per 1000 km<sup>2</sup> of IA

It is clear that the above-average number of projects in both regional clusters were subsidized by the Environmental Fund. This fund mainly focused on the support of small projects that resulted in high number of projects subsidized.

When analysing the volume of subsidies obtained by regions, there was a visible influence of projects supported by ISPA scheme. This was mainly caused by the fact, that the fund supported large infrastructural projects, thus several-fold exceeded the volume of subsidies provided for other analysed schemes.

**Table 2. Volume of Irretrievable Financial Subsidies (IFS) for Environmental Projects in Regional Clusters**

	IFS		IFSA		IFSL		IFSIA	
	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB	ZA, TR, TN	KE, PO, NR, BB
Phare	255925	326993	0,1	0,1	16,5	10,4	374,5	85,1
ISPA	6508386	8194192	3,5	2,8	421	260	9523,5	2132,4
Sapard	43712	82661	0	0	2,8	2,62	64	21,5
OP BI	1328910	3761412	0,7	1,3	86	119,3	1944,6	978,8
SOP IS	295536	465173	0,2	0,1	19,1	14,7	432,4	121,1
SOP ARD	69674	308871	0	0,1	4,5	9,8	101,9	80,4
RDP	2993605	6617603	1,6	2,2	193,6	209,9	4380,4	1722,1
EnviroF	1253698	3551698	0,7	1,21	81,1	112,7	1834,5	924,2
RecF	643252	1313147	0,3	0,4	41,6	41,6	941,2	341,7

IFS - IFS in thousands of SKK, IFSP - IFS in thousands of SKK per mil. of inhabitants, IFSL - IFS in thousands of SKK per 1000 km<sup>2</sup> of land, IFSIA - IFS in thousands of SKK per 1000 km<sup>2</sup> of IA

It is impossible to decide unambiguously, whether any of the differentiated regional clusters reached a significantly higher volume of subsidies than other from results calculated. Results of hypotheses testing of the congruence of mean values are summarized in Table 3.



**Table 3. Congruence of the Number of Environmental Projects and Volume of Financial Subsidies for Environmental Projects in Economically More and Less Developed Regions**

	$\mu_1 \neq \mu_2$	$\mu_1 < \mu_2$	$\mu_1 > \mu_2$
number of projects (np)	-0,7510	-0,7510	-0,8393
np per 1 mil. of inhabitants	0,0000	0,0883	0,0000
np per 1000 km <sup>2</sup> of land	0,0883	0,1766	0,0883
np per 1000 km <sup>2</sup> of influenced area	1,7660	1,8543	1,7660 <sup>+</sup>
irretrievable financial subsidy (IFS)	-1,1479	-1,1479	-1,2362
IFS per 1 mil. of inhabitants	-0,1766	-0,1766	-0,2649
IFS per 1000 km <sup>2</sup> of land	0,0000	0,0000	0,0883
IFS per 1000 km <sup>2</sup> of influenced area	1,1479	1,2362	1,1479

Results of analyses clearly show that the success of gaining environmental projects is not determined by the economic development of the region (or the regional cluster). Only one case is detected, where Hypothesis 0 was rejected. However, the alternative hypothesis (the one we were forced to accept based on results of the analyses) states that the group of regions that are economically more developed received a higher volume of subsidies per unit of influenced area than the group of less developed regions.

The success of obtaining environmental projects is influenced by factors different from economic regional disparities. This conclusion is solely based on our own data analysis. The transparency of our selected data can be disputed (the lack of relevant databases registering environmental projects), as well as inclusion of partially heterogeneous group of analysed subsidy schemes; the non-paralleled activities of regions evaluated not on the basis of projects approved, but rather the proposed environmental projects; the analysed units of area that are not necessarily showing the existing environmental disparities inside the region or other determining factors have to be taken into consideration.

This analysis follows real possibilities and obtainable relevant data. Even without covering other (maybe latent) determinants, some of which are difficult to quantify, at least a sporadic confirmation of our hypothesis is expected. The zero confirmation leads to questions about the effectiveness of targeting subsidies for that particular group of projects.

### Results and Discussion

Considering the increasing industrial and human activities around the world, the issue of environment and its sustainability has become a central element of public policymaking (Macak and Hron, 2016; Adamisin et al., 2017). Dotti (2016) argues, while regional policy has an ambitious goal to promote the regions lagging behind and promote convergence between the regions, its impact depends on the ability of regional politicians to obtain and use the EU funding schemes to meet the needs of the region. The environmental consciousness needs to be reflected in other areas

of the national economy and thus linked to all aspects of the society. Fazekas et al. (2015) argue that existing and upcoming climate changes have a negative impact on Slovakia. Although the government acquired significant tools because of decentralization, they are still relatively inactive in this area. Therefore, it is necessary to increase awareness, knowledge, and motivation for good governance and sustainable development (Kravcakova Vozarova and Kotulic, 2015; Andrejovska et al., 2016).

Structural funds are an important instrument in solution to regional disparities. Its effective use often depends on different political decisions or lobby group pressure (Kotulic and Dubravska, 2015). This article follows, whether the support is more targeted towards economically less developed regions to decrease regional disparities. Impact of project implementation and practical contribution on regional level was not studied.

We assumed statistically significant differences in the number of environmental projects obtained between economically developed and less developed regions. The regions fall into two groups - economically advanced and economically less-developed regions. For an easier calculated analysis, the region was identical with self-governing regions of the Slovak Republic. Based on the analysis performed, the expected results were not confirmed. There was not confirmed a statistically significant relationship between the economic development of the region and the subsidy received for environmental projects. Taking into account these facts, we cannot claim that support for environmental projects at regional level is a tool to reduce the regional disparities.

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## References

- Adamisin P., Kotulic R., Kravcakova Vozarova I., 2017, *Legal form of agricultural entities as a factor in ensuring the sustainability of the economic performance of agriculture*, "Agricultural Economics – Czech", 63(2).
- Amore D.M., Bennesen M., 2010, *Corporate governance and green innovation*, "Journal of Environmental Management", 75.
- Andrejovska A., Buleca J., Hudakova M., 2016, *Categorization of the EU countries in the context of agricultural production*, "Agris On-line Papers in Economics and Informatics", 8(4).

- Bahn-Walkowiak B., Usubiaga A., Schepelmann P., 2012, *EU structural and cohesion Policy and sustainable development*, Wuppertal: Wuppertal Institute for Climate.
- Baresi U., Vella K.J., Sipe N.G., 2017, *Bridging the divide between theory and guidance in strategic environmental assessment: A path for Italian regions*, "Environmental Impact Assessment Review", 62.
- Cihelkova E., 2012, *Regional environmental governance: The NAFTA case*, "Agricultural Economics – Czech", 58.
- Daneshpour H., 2015, *Integrating sustainability into management of project*, "International Journal of Environmental Science and Development", 6.
- Dotti N.F., 2016, *Unwritten factors affecting structural funds: The influence of regional political behaviours on the implementation of EU cohesion policy*, "European Planning Studies", 24.
- Fazekas J., Chovancova J., Fazekasova D., 2015, *Energy efficiency as a tool of climate change mitigation – A case study of Slovak municipality*, "Obuda University e-Bulletin", 5.
- Huttmanova E., 2015, *Evaluation of sustainability in the EU countries using selected indicators of sustainable development*, [In:] Environmental economics, education and accreditation in geosciences: ecology, economics, education and legislation, 15<sup>th</sup> International Multidisciplinary Scientific GeoConference SGEM 2015, Bulgaria.
- Jenicek V., 2013, *Modification of sustainability indicators*, "Agricultural Economics – Czech", 59.
- Kotulic R., 2011, *Program SAPARD – commitments and payments according to individual provisions before the acceptance of the Slovak republic into the European Union*, "Polish Journal of Management Studies", 3.
- Kotulic R., Dubravska M., 2015, *Impact of the management tendencies of the common agricultural policy on the budget of the European Union*, "Polish Journal of Management Studies", 11(2).
- Kravcakova Vojarova I., Kotulic, R., 2016, *Quantification of the effect of subsidies on the production performance of the Slovak agriculture*, "Procedia Economics and Finance", 39.
- Kravcakova Vojarova I., Kotulic R., 2015, *Theoretical background of financial management in the context of cap subsidies in V4 Countries*, "Polish Journal of Management Studies", 12(1).
- Macak T., Hron J., 2016, *Robust parameter design for the optimisation of cutting conditions according to energy efficiency criteria*, "Agricultural Economics – Czech", 62.
- Majernik M. et al., 2007, *Posudzovanie vplyvov cinnosti na zivotne prostredie [Impact Assessment of Activities on Environment]*, Skalica: SVŠ v Skalici.
- Nahtigal M., 2013, *European regional disparities: the crucial source of European in sustainability*, "Lex Localis-Journal of Local Self-Government", 11.
- Pavolova H., Csikosova A., Bakalar T., 2014, *Development of Kosice Region by implementation of environmental projects in the field of water management – case study*, "Ekologia", 33.
- Sira E., Vavrek R., Pukala R., 2017, *The impact of development of insurance market and economy on the competitiveness of the country on example of V4 Countries*, "Ad Alta - Journal of Interdisciplinary Research", 7(2).
- Stanef M.R., 2012, *Urban and rural disparities across Europe – case study Romania*, "Metalurgia International", 17.

- Stefko R., Habanik J., Butoracova Sindleryova I., 2010, *Marketing instrumentary in the process of project acceptance within the acceleration of back-warded regions development*, "Ekonomicky casopis", 58.
- Tej J., Zivcak P., Taha V.A., Sirková M., 2014, *Crisis awareness of the municipal district residents: Implication for crisis management at the local government level*, "Quality Innovation Prosperity", 18(2).
- Vavrek R., Kotulic R., Adamisin P., 2015, *Evaluation of municipalities management with the Topsis technique emphasizing on the impact of weights of established criteria*, "Lex localis - Journal of Local Self-Government", 13(2).
- Vavrek R., Adamisin P., Kotulic R., 2017, *Multi-criteria evaluation of municipalities in Slovakia - case study in selected districts*, "Polish Journal of Managements Studies", 16(2).
- Wals A.E.J., Rodela R., 2014, *Social learning towards sustainability: problematic, perspectives and promise*, "Njas-Wageningen Journal of Life Sciences", 69.
- Warlenius R., Pierce G., Ramasar V., 2015, *Reversing the arrow of arrears: the concept of "ecological debt" and its value for environmental justice*, "Global Environmental Change", 30.
- Zdrzil P., Applova P., 2016, *Growth disparities among regions of the Visegrad Group Countries: an evidence of their extent and nature*, "E&M Ekonomie a Management", 2.
- Zvingule L. et al., 2013, *Improved project management via advancement in evaluation methodology of regional cooperation environmental projects*, "Environmental and Climate Technologies", 11.

## MENEDŽERSKIE PODEJŚCIA DO PROJEKTÓW ŚRODOWISKOWYCH: BADANIE EMPIRYCZNE

**Streszczenie:** Przystąpienie Słowacji do Unii Europejskiej dało możliwość uczestnictwa w programach finansowych skoncentrowanych na różnych sferach społecznych i gospodarczych, finansowanych w znacznej mierze ze środków UE. Jednym z obszarów dotacji była ochrona środowiska. Ze względu na specyfikę projektów środowiskowych, dysponowanie tą pomocą finansową jest w wielu przypadkach nieuniknione. Artykuł analizuje rozmieszczenie przestrzenne projektów środowiskowych finansowanych z odpowiednich programów subsydiowania w poszczególnych regionach Słowacji. Można uznać, że nie ma istotnej ścisłej korelacji między rozwojem gospodarczym danego terytorium a wsparciem za pośrednictwem realizowanych projektów.

**Słowa kluczowe:** analiza skupień, współczynnik korelacji kofenetycznej, projekty środowiskowe, regionalne zróżnicowanie, fundusz strukturalny, zrównoważone planowanie

### 环境项目管理探讨：实证研究

**摘要：**斯洛伐克加入欧盟大大支持了参与重点在社会和经济领域不同领域的金融计划的可能性，这些计划主要由欧盟提供资金。其中一个补贴领域就是环境保护。由于环境项目的具体情况，在许多情况下，这种财政援助的不可挽回的处置是不可避免的。本文分析了斯洛伐克个别地区相关补贴计划资助的环境项目的空间分布。我们可以认识到，一个领土的经济发展与通过实施项目提供的支持之间没有显著的紧密关联。

**关键词：**聚类分析，共生相关系数，环境项目，区域差异化，结构性资金，可持续规划。