

IDENTIFICATION OF DEVELOPMENT HOT-SPOTS IN NÓGRÁD COUNTY

György Áldorfai¹, Henrietta Nagy²

Szent István University^{1,2}

Faculty of Economics and Social Sciences

1 Páter Károly str

Gödöllő, Hungary

e-mail^{1,2}: aldorfai.gyorgy@gtk.szie.hu, nagy.henrietta@gtk.szie.hu

Abstract

Paper's objective(s):

Several research attempts have been made to investigate disadvantaged rural areas; however, it is not easy to find one which would examine their development together with their immediate environment, and by complex methods. In our study we try to determine those "hot-spots" which could positively or negatively influence the development of a settlement. Our chosen territorial area is Nógrád County which is one of the most disadvantaged area in Hungary.

Data/Methods:

In our study we use a complex methodology, due to the fact that development processes of territorial units and their competitiveness play a key role in the formation of territorial differences.

Results/Conclusions:

In order for us to draw our conclusions about the spatial distribution of the indexes we created maps by using the Quantum GIS software, to better illustrate our results.

Keywords: *methodology, development, comparison, measurable*

JEL classification: *R10, R58*

1 Introduction

The role of rural and disadvantaged (or lagging behind) areas is getting more and more important in the policies of the European Union (EU). The main reason behind this is the presence of differences between regions in size, historical, economic, social and environmental development level and in many other aspects. A region's survival is strongly connected to the capital invested into them but there are two well-known ways how could they attract it. Firstly, they have to utilise their resources or they have to improve their infrastructure. Both of them need capital for their initiation, but the benefits gained may be worth it.

Several researchers (Péli, 2015, Káposzta 2014) state that the most significant development activities must be carried out in the centres, because only these 'core areas' can generate dynamic growth in their agglomeration areas, and in the ever expanding outer peripheries. Furthermore, they state that the main driver of regional disparities is the restructuring effects of socio-economic processes and these factors become more and more significant. As a solution for the peripheral (lagging behind) regions they mention the knowledge about processes resulting regional differences and their impact on the spatial structure, the endogenous based development strategies and improvement of internal capital.

The standpoint of the EU is that each region has a specific 'territorial capital' that is distinct from other areas and generates a higher return for specific investments than for others, since these are better suited to the area and use its assets and potential more effectively. For example, many rural areas possess values which are not obvious for the first sight, but they can be utilized for many purposes, for example, as recreation areas. The role and the importance of the locality is a growing issue in the EU and worldwide as well. Besides the rational planning of community resources and the full-scale mapping of local resources the involvement of the local population is very important in working out complex development directions. (Áldorfai et al. 2015).

Areas without strong secondary and tertiary sectors, well-developed infrastructure, basic services and jobs have some good opportunities (and give the basis of the new initiatives) in the time period 2014 and 2020 by the help of rural development policy of the European Union (EU) (Ritter et.al, 2013). According to the development policy the importance of the industrial development in rural areas, the improvement of the food economy and infrastructure, improving social situation and the expansion of rural tourism, environment has emphasized (Káposzta and Nagy, 2013). However, Kassai and Ritter (2011) said that in order to an area could implement a form of Local Economic (endogenous) Development or could be competitive they must have strong infrastructural endowment

and local communities. This is also the opinion of Aschauer D. (1990). He thought that some of the possible gains to the quality of life and to economic performance might arise from increased infrastructure investment. Numerous past infrastructural investments have been responsible for significant improvements in the overall quality of life in terms of health, safety, economic opportunity, and leisure time and activities.

The development levels of countries are measured generally by their GNI, while regions are measured by using GDP (European Commission, 2015). Experts have been debating for decades about the usage and content of GDP, as an indicator measuring economic development. It is clear that it properly represents income levels; however, it cannot be applied for measuring competitiveness or social welfare, due to its lacking nature (Stiglitz et al, 2010).

According to Csath (2016) beside the governmental, infrastructural, macro-economic and human resources data, data related to innovation, technological readiness and innovation abilities are very important in the development level of a region. Innovation activity and income levels show positive correlation, which means that in those areas, where intensive knowledge-based activities are carried out, and the proportion of R&D spending is high, we can see higher income levels. We can easily observe the opposite situation in the case of lagging behind areas.

In Hungary the territorial inequalities increased after the political transition in 1989-1990. The seven statistical regions created as a requirement for the EU therefore, they do not cover homogenous territories. This is one of the reasons why the development level of the capital city is much higher than the other regions' status and distorts the development data of the Central-Hungarian region in a positive way (Budapest produces approximately 40% of the Hungarian GDP) (Káposzta-Nagy, 2013). Now Budapest belongs to the 25 best-performing regions in the European Union, but four regions out of the seven belong to the 20 poorest regions of the EU: Northern-Hungary, Northern Great Plain, Southern Great Plain, Southern Transdanubia (Tóth, 2016).

The development trends and regional competition processes are generated by the changes in natural resources, endowments, population, production, infrastructure, and their relationship in a country and in its regions. It is important to be noted, that there are factors that the regions can change in order to improve their conditions, and there are ones, which they cannot. Péli and Neszmélyi (2015) found that in Hungary, between 2003 and 2010 only Budapest and its expanding agglomeration, namely Central Hungary, was the only region that could improve its status over the seven years. Settlements in this area, therefore, automatically enjoyed some privileges, which farther regions could not. This result shows well the high level of regional disparities in Hungary.

Due to the complexity of regional differences it is not advisable to conduct regional analysis based on only a few economic indicators. The financial resources of rural development are not sufficient to satisfy the development needs of rural areas; the financial resources for improving the rural economies are also not sufficient for generating growth in these areas. However, successful settlement development can only be carried out within a complex approach (Áldorfai et al, 2015)

It is one of the basic problems of development that Hungarian and international strategic documents are methodologically lacking sometimes. Despite the fact the requirements of the EU are getting ever stricter towards these documents, their quality shows significant fluctuation. Therefore, a complex methodology, perspective is needed to solve this problem. This complex method ensures a systematic approach, the investigation of local problems and provides a new way to create an objective situation report for strategy generation (for example CLLD); it enables its user to create a basis for monitoring economic activities and to designate hot spots for development. The methodology this study presents (Regional Performance Analysis) uses static and dynamic indicators for the examined time period for the changes in development of a certain region. By the help of this analysis hot spots can be defined. It means that those areas will be discovered which need development, and those strengths are also identified, which the development activities can be based. Also, it provides opportunity to investigated indicators and dimensions in a smaller and in a larger region as well.

2 Data and Methods

Based on the literature background and our own experiences our pre-defined indicator systems contain 60 basic indicators, including 40 complex indicators along four dimensions, which are the local economic, the society, the environment and the infrastructure. Performance analysis – based on indicator groups related to the abovementioned four dimensions – measures a region in two ways. First, it measures the natural evolution level – dynamic analysis –, in which the changes of the region are investigated in the time period between 2006 and 2013. The next step is the analysis of the development level – static analysis – in which the situation of the region is investigated in every year of the programming period 2007 and 2013 time period. As a basis we choose the settlement structure and dataset of the year 2006 for comparison. Our chosen area is Nógrád county, part of Northern-Hungary region which is one of the most disadvantaged region not only in Hungary but also in the European Union. We collect data for every settlement in the county, then the performance of certain settlements (evaluated by the pre-defined criteria-system) is compared to the County and also the Regional

values. After that, by taking the average value of the indicator groups we can describe the performance of the region on indicator, dimension and index levels. Finally, we illustrate the results at settlement, county and regional level on various maps by the use of Quantum GIS program.

3 Results and Discussion

The classification of the Regional Performance Analysis (RPA) is indicated by Table 1, which, based on our methodology, contains 7 categories (intensively developing, developing, began developing, stagnant, lagging, declining, more declining) on a scale from -100 to 100.

Table 1 **The classification of the Regional Performance Analysis**

Classification		
Sorting		Name
50,001	← 100	intensively developing
20,001	← 50	developing
5,001	← 20	began developing
-5	← 5	stagnant
-20	← -5,001	lagging
-50	← -20,001	declining
-100	← -50,001	more declining

Source: The author's own editing.

Table 2 illustrates in separate cells the dimension-, indicator- and index level results of our research. The county belongs to the lagging category on index level, similarly to the dimensions of society, local economy and environment. Only the infrastructure dimension could reach the stagnant state.

Table 2 The result of the Regional Performance Analysis (county level)

Local economy											Dimension value	
The proportion of businesses operating within the registered ones	Number of retail stores per capita in 1000	Gross value added per capita	Revenue from small-scale agriculture per 1000 inhabitants	The relative income per one inhabitant of working age	Number of commercial accommodations per capita in 1000	Number of catering establishments per 1000 inhabitants	The number of guest nights per night in one of the commercial and non-commercial accommodations	Number of non-commercial accommodations per capita in 1000n	The number of subsidies paid within the frame of the 1., 3. and 4. axes of the EAFRD	The amount of local taxes per capita		
Nógrád County (county)	-39,2	-10,2	-18,7	-58,5	9,6	-58,1	-12,2	-8,7	-17,0	39,8	-6,7	-14,1
Nógrád County (region)	11,5	-20,6	-28,0	-62,5	-11,4	-66,3	2,9	-4,5	-18,4	25,5	-16,6	-17,2
Society											Dimension value	
Net migration per 1,000 persons	Natural increase per 1,000 persons	Population density	Aging index	Dependency index	Relative economic activity (%)	The relative ratio of registered unemployed	The relative indicator of the registered people unemployed for more than 180 days	Regular social assistance amount used per 1000 inhabitants	Participating in cultural events per 1000 inhabitants			
Nógrád County (county)	-12,8	-12,5	-39,5	-0,2	-6,8	-7,3	-14,5	-17,5	-7,8	-9,1	-4,4	
Nógrád County (region)	-9,3	-29,2	-51,9	-13,8	-14,1	-10,7	-7,6	-14,1	-14,1	-10,1	-17,5	
Environment											Dimension value	
The amount of municipal solid waste shipped from the inhabitants	The generated amount of hazardous waste	The proportion of homes involved in regular waste collection	The rate of households involved in selective waste collection	The proportion of recycled municipal solid waste	The primary utility gap	The amount of support payments related to environmental actions per 1000 people	Fines, penalties and other special revenue of the Local Government related to local taxes	The volume of wood per 1 hectare				
Nógrád County (county)	-68,7	71,9	-2,3	-71,3	-67,8	-5,5	-6,9	49,4	-5,0	-9,6		
Nógrád County (region)	-37,1	72,0	-10,4	-69,9	-67,3	-22,5	-13,4	60,2	2,0	-11,8		
Infrastructure											Dimension value	
Average distance in time to the micro-regional centers	Secondary utility gap	The rate of domestic gas consumers	The rate of household electricity consumers	The number of passenger cars per 1,000 persons	The number of patients per one family doctor	The number of social catering recipients per 1000 inhabitants	Average student numbers in primary schools	The rate of public spaces and roads built by the Local Government	The rate of sidewalks built by the Local Government			
Nógrád County (county)	-1,3	-20,0	-10,0	-6,5	13,3	14,3	-14,1	-5,5	-34,9	7,4	-4,7	
Nógrád County (region)	-6,4	-21,0	-5,2	-12,8	18,8	15,0	-2,4	-5,5	15,5	-21,5	-2,5	
Regional Performance Analysis - Nógrád County (county)											-9,31	
Regional Performance Analysis - Nógrád County (region)											-12,39	

Source: The author's own editing.

The results of the aggregate index and the dimensions clearly indicate that the values of the index are even lower compared to the regional level, except for the infrastructural dimensions. It means that the county level infrastructure performs better than regional level infrastructure in the investigated time period. We can observe a similar trend on indicator level; in other words, infrastructural indicators show a significantly better situation than the indicators of other dimensions, compared to the regional level.

Local economy

The lowest performing indicators were the 'income from agriculture' and the 'number of commercial accommodations'; however, the 'payments from axes 1, 3 and 4 of the ERDFA' performed outstandingly, regardless of the reference points. From this we drew the conclusion that the agricultural and tourism activities of the county are not highly significant sectors in the county; on the other hand, there is a great effort to improve this situation, since the ERDFA payments were used to develop SMEs. As a result, the county shows a better situation regarding to the operating enterprises compared to the regional data. Unfortunately, none of the other indicators showed similarly positive values, which means that despite the development activities and efforts, they could not push the local economy onto a development path.

Society

On county level we could not find outstanding values regarding to this dimension, however, compared to the regional level values we could; it can be observed that the population and natural reproduction is significantly low, and other demographic indicators are also lower, when compared to the regional level. In the case of unemployment data we can see better results, which may be the result of the efforts to obtain more development funds.

Environment

On the indicator level the environment dimension shows the most significant different, by which we mean that the highest and lowest values were both produced by this dimension. This duality comes from environment protection, since the high amount of hazardous waste produced here and fines related to waste management is very high in the county, but selective waste collecting and waste utilisation is very low. This leads us to believe that the infrastructure related to waste management is weak in the region.

Infrastructure

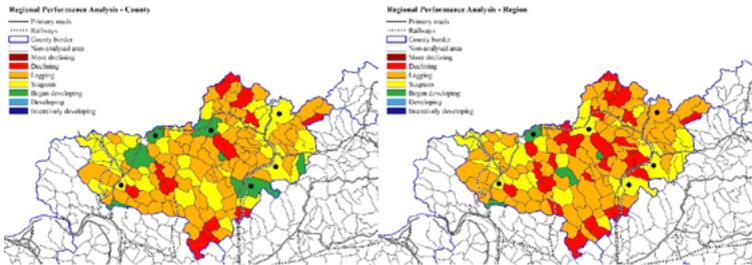
The number of general practitioners and the infrastructure related to personal transport shows stable development compared to county and regional levels, unlike the public utility gap, which shows the lowest value from the indicators. We can observe a certain duality in this dimension as well. This duality is about the roads and sidewalks. Compared to the county level the size of the sidewalk network is large enough to be a strong point, while compared to the regional level

the size of the road network was high. It means that these indicators were not particularly strong on a county level, but on regional level, they were.

The results of the analysis of the settlement level data are presented on maps. According to Péli (2015), the most important development investments need to be implemented in the centres, because only these core areas are able to generate dynamic growth in their agglomerations, and in the gradually growing peripheries. This theory is proved to be right, based on our calculations. There are 6 towns in Nógrád county, one of which is a county seat. These cities (all marked in black circles) are located in the outer perimeter areas of the county, along the main traffic corridors (primary roads). Consequently, the inner core of the county does not have a city or a primary road, which is a major obstacle to development.

Our Regional Performance Analysis also uncovered this fact, and the results can be seen on Figure 1. The cities and the areas marked on the map are stagnating or started developing on a county level, which is not only the result of the generated economic growth but also the transport possibilities. It can also be seen that along the main traffic route of the county, the performance of the settlements is higher than the county's inner core. This observation is similar to another theory, which says that major roads pull the resources in the direction of the core areas from the peripheries. On a regional level, development can no longer be observed at settlement level as shown on the map on the right side of Figure 1. Even the performance of the county seat declines in a regional comparison. However, we can see that a significant part of the settlements with stagnant performance are also located in the main traffic corridors. Our results reveal that in the case of towns the interrelations of the economic and infrastructure dimensions, while for small settlements the economy and the environment dimensions are the hot spots along which development has started. Unfortunately, in the case of declining performance settlements, we observed the combined negative effect of 3 dimensions. Thus, in these settlements, the results show a degree of deterioration that whole dimensions can be identified as hot spots. In our opinion, a settlement alone cannot respond to more serious challenges, so external intervention is necessary if we want to prevent the collapse of these settlements.

Figure 1 The results of the Regional Performance Analysis of the settlement level



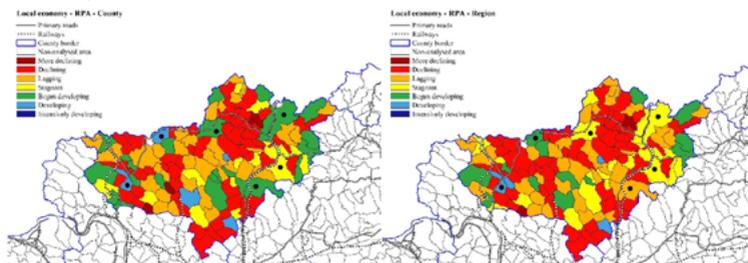
Source: The authors' own editing by using the QGIS application, 2018.

Note: In the case of the map on the left we used the county level, while for the map on the right we used to regional level values as reference.

Local economy (Figure 2) is a lagging dimension, and the worst-performing dimension of the region; however, it was found that on settlement level we can observe development, to some extent. The result of the performance analysis is that on county level five settlements are developing, 22 settlements have started to develop, 13 settlements are stagnant, 33 settlements are lagging, 55 settlements are declining and 2 settlements are even more declining (in a regional comparison the results are even worse). This distribution indicates the local economic situation of the county well. It was interesting to find that the developed settlements are somewhat dispersed; however, they are mostly situated close to larger towns or transport hubs. It was also found, that around these settlements the economy has started to decline. This may be because the developing settlements drain away the economic potential (e.g. labour force) from them, and they could not counter this effect so far.

As we have uncovered at the county level analysis, it was observable on a settlement level as well, that in the case of local economy, except for developing settlement, neither tourism nor agriculture prospers, in spite of the fact the main profile of the settlements of Nógrád county used to be agricultural small-scale production (Figure 2). In addition, there is no development in the other branches of the economy, as in the majority of settlements the gross added value is lagging. Thus, we determined that the hot spot of local economy should be the development and competitiveness of the local enterprises.

Figure 2 **The map of the local economy dimension of the Regional Performance Analysis (settlement level)**

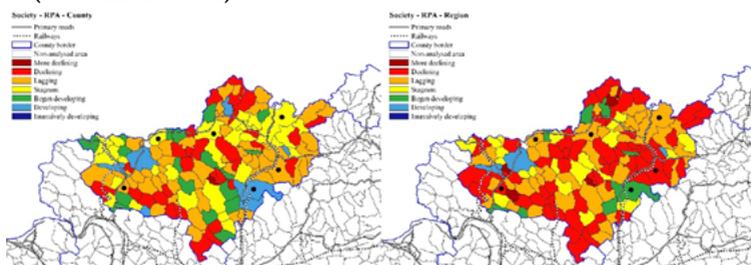


Source: The authors' own editing by using the QGIS application, 2018.

Note: In the case of the map on the left we used the county level, while for the map on the right we used to regional level values as reference.

The society dimension (Figure 3) is also lagging, but it shows a better situation than the local economy dimension, based on the Regional Performance Analysis. We can observe it here, too, that the differences between the lowest and highest values can be significant on county level.

Figure 3 **The map of the society dimension of the Regional Performance Analysis (settlement level)**



Source: The authors' own editing by using the QGIS application, 2018.

Note: In the case of the map on the left we used the county level, while for the map on the right we used to regional level values as reference.

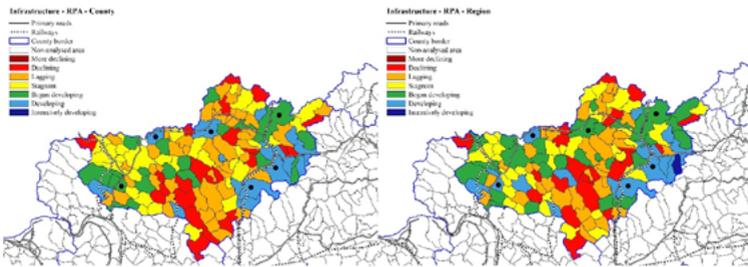
It is not unambiguous on the county level, but it is on the regional perspective that the performance of the society is significant along the traffic corridors and is lagging behind in the inner core. It is also possible to observe that the social situation of rural areas is better than that of cities. From this we came to the conclusion that in these areas social relations, the rural environment and the Hungarian and minority culture play an important role in the development of social structure in

the county. On the regional level, these factors disappear and a significant decline can be seen in the county.

The infrastructure dimension (Figure 4) is the only one showing a stagnating situation (and it can be also observed that the lowest differences between the highest and lowest number can be found here), based on the Regional Performance Analysis. As it was mentioned in the introduction, the survival of a settlement depends greatly on the capital invested in there, and this capital can be attracted by using own resources properly or improving the local infrastructure.

This statement proved to be true in our analysis, since those settlements, which did not show neither economic nor social development, are also lagging in infrastructural sense in the past 7 years (Figure 4.). This indicator is not affected by the direction, type of size of the main roads, but the answers given by the local decision makers aiming to counter its problems.

Figure 4 The map of the infrastructure dimension of the Regional Performance Analysis (settlement level)

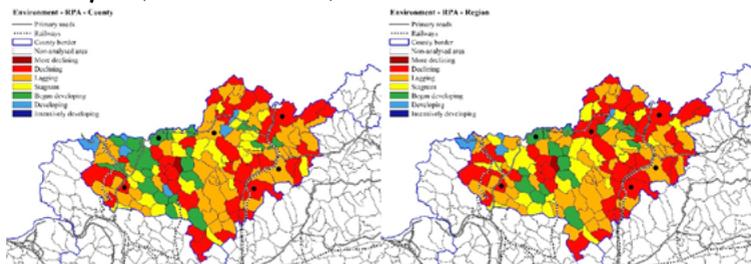


Source: The authors' own editing by using the QGIS application, 2018.

Note: In the case of the map on the left we used the county level, while for the map on the right we used to regional level values as reference.

As it was mentioned before, the environmental dimension (Figure 5) was the only one, which stagnated from the four dimensions. On the indicator level this dimension shows significant differences, but one section (waste management) can be established as leading potential. There is a certain concentration on settlement level, creating both negative and positive hot spots as well. This may be the result of the organisation of waste management, and also of differences in the environment-awareness of the population.

Figure 5 **The map of the environment dimension of the Regional Performance Analysis (settlement level)**



Source: The authors' own editing by using the QGIS application, 2018.

Note: In the case of the map on the left we used the county level, while for the map on the right we used to regional level values as reference.

4 Conclusion

It is clear from our research that towns and major transport routes play a significant role in development of the county's resources. Because of close to them significant economic and social development can be observed, but farther from them only infrastructure development could be measured. Wastewater management and its organization are a major hot spot, despite the high environmental awareness of the population in the county. The social situation of rural areas in the region is better than the towns. In these areas, social relations, the rural environment, and the Hungarian and minority cultures play a significant role in the development of social structure, but on regional level these factors disappear and significant social decline is observable in the county. Agriculture and tourism are not significant sectors of the region, despite the fact that the main profile of the settlements of Nógrád County used to be small-scale farming. In spite of high level of application intensity, developments and other efforts, this branch of the county's economy could not be pushed in a positive direction. Other branches of the economy showed no progress either, as in the majority of settlements the gross value added is weakening. Thus, we determined the development and competitiveness of economic enterprises as the hot spot of the local economy. Our results reveal that in the case of towns the interrelations of the economic and infrastructure dimensions, while for small settlements the economy and the environment dimensions are the hot spots along which development has started. Unfortunately, in the case of settlements with declining performance, we observed the combined negative effects of 3 dimensions. Thus, in these settlements, the

results show a degree of deterioration that whole dimensions can be identified as hot spots. In our opinion, a settlement alone cannot respond to more serious challenges, so external intervention is necessary if we want to prevent the collapse of these settlements.

We believe that we started to develop a new methodology with our study, which shows similarity to many theoretical concepts, and therefore it supports the foundation of development plans. Since the index can be derived to all of its elements, including the levels of dimensions and indicators, as well as to static and dynamic analyses, we can see that which are the specific local characteristics, strengths and weaknesses. Also, we can see that which regions perform better or weaker. By learning these we can find those development nodes/hot spots (which can be either characteristics or geographical areas) which are necessary to develop, or on which later development can be based on. We believe that the Regional Performance Analysis has the potential to describe reality with static and dynamic methods to identify development paths in a given time period. Therefore, reflects to the market economy, social and other global processes, and to development initiated by national and international capital as well. In other words, we can tell how successfully the regions could meet the challenge posed by these processes.

Acknowledgements



„Supported BY the ÚNKP-17-3 and ÚNKP-17-4-III-18 New National Excellence Program of the Ministry of Human Capacities”

References

1. ÁLDORFAI, GY., TOPA, Z., KÁPOSZTA, J. (2015). The planning of the Hungarian Local Development Strategies by using CLLD – approach, ACTA AVADA 2015:(2) pp. 13-22.
2. ASCHAUER, A. D. (1990). Why is infrastructure important? In: Munnell A. (ed.): Is there a shortfall in public capital investment? MA: Federal Reserve Bank of Boston, Boston, 1990, pp. 21-50
3. CSATH, M. (2016). A regionális fejlettség mérése társadalmi-gazdasági mutatók alapján. Pest megyei esettanulmány in: Csath M. (szerk.): Regionális versenyképességi tanulmányok, NKE Szolgáltató Nonprofit Kft., Budapest, 2016, 73-107. p. (Measuring the regional development based on socioecono-

- mic indicators. Case study in Pest county in Csath M. (ed.): Regional competitiveness case studies, National Public Service University Service Nonprofit Ltd., Budapest, 2016. 73-107. p.)
4. European Commission. (2015). Regional Policy – Inforegio: Which regions are affected? Available at: http://ec.europa.eu/regional_policy/archive/policy/region/index_en.htm
 5. KÁPOSZTA, J., NAGY, H. (2013). Vidékfejlesztés és környezetipar kapcsolatrendszere az endogén fejlődésben, JOURNAL OF CENTRAL EUROPEAN GREEN INNOVATION 1:(1) pp. 71-83.
 6. KÁPOSZTA, J. (2014). Területi különbségek kialakulásának főbb összefüggései, Gazdálkodás 58. évfolyam, 2014/5. szám, pp. 399-412
 7. KASSAI, ZS., RITTER, K. (2011). Helyi vidékfejlesztési programok a hátrányos helyzetű vidéki kistérségekben, Gazdálkodás 55. évfolyam, 2011/4. szám, pp. 337-346.
 8. PÉLI, L., NESZMÉLYI, GY. I. (2015). Territorial Differences Of Rural Cities And The Development Of Transport Infrastructure In Hungary, ROMANIAN REVIEW OF REGIONAL STUDIES: JOURNAL OF THE CENTRE FOR REGIONAL GEOGRAPHY 11:(2) pp. 51-66.
 9. RITTER, K., NAGY, H., TÓTH, T. (2013). Hátrányos helyzetű vidéki térségek és helyi fejlesztési lehetőségeik egy Észak-magyarországi példán keresztül. pp. 224-242. In: Lukovics M. - Savanya P. (Szerk.): Új hangsúlyok a területi fejlődésben. Szeged: JATE Press
 10. STIGLITZ, et al (2010): Mismeasuring Our Lives: Why GDP Doesn't Add Up, Report by the Commission on the measurement of Economic Performance and Social Progress, Available at: http://library.bsl.org.au/jspui/bitstream/1/1267/1/Measurement_of_economic_performance_and_social_progress.pdf.