'Club of Economics in Miskolc' TMP Vol.16., Nr. 1., pp. 65-76. 2020. http://dx.doi.org/10.18096/TMP.2020.01.07

Examination of Social Innovation Potential Characteristics in the Example of Borsod-Abaúj-Zemplén County[1]

KRISZTINA VARGA
ASSISTANT LECTURER
UNIVERSITY OF MISKOLC
e-mail: varga.krisztina@uni-miskolc.hu

GÉZA TÓTH, Ph.D.
ASSOCIATE PROFESSOR
UNIVERSITY OF MISKOLC
e-mail: geza.toth@uni-miskolc.hu

ZOLTÁN NAGY, Ph.D.
ASSOCIATE PROFESSOR
UNIVERSITY OF MISKOLC
e-mail: regnzozo@uni-miskolc.hu

SUMMARY

This study defines a process-oriented framework for measuring social innovation. The paper presents a practical example of measuring social innovation potential. We introduce the indicator groups used and their contents. Through a map interpretation we demonstrate the spatial representation of the input, output, impact and complex indicators. The objective of this approach is to draw attention to the settlements/groups of settlements where the socio-economic bases of social innovations can best be found in Borsod-Abaúj-Zemplén County.

Keywords: social innovation, indicator system, spatial inequalities, spatial autocorrelation, population change
Journal of Economic Literature (JEL) codes: O35, R11, R14
DOI: http://dx.doi.org/10.18096/TMP.2020.01.07

INTRODUCTION

The European Union is facing a serious dilemma. On the one hand, it is important to maintain or strengthen its international competitiveness, which requires economic innovation. On the other hand, due to growing social disparities, it has raised the issue of social cohesion to the level of community policies (EC 2013a). Particular emphasis has been placed on addressing the consequences of the economic crisis of 2008. Although the European Union does not have competence in this area, since the issue is essentially a Member State competence, it does try to encourage them to pay more attention to social innovation through guidelines and subsidies.

Social innovation in the economic sense is result-oriented (as opposed to a process-oriented approach focusing on social practices) and its impact can be measured by examining new ideas, services and systematic transformations. The measurement is supported by definitions of social innovation related to international organizations, which identify social innovation as a means of development, focus on the process of new ideas (product, service, model), meeting social needs, and mobilise novel social relations and cooperation (OECD, 2000, 2012; EC, 2013b, 2014; Sabato et al., 2015).

[1] *The study (based on several years of research by the authors) is based on the article Z. Nagy - G. Tóth: Measuring Possibilities of Social Innovation Potential in Borsod-Abaúj-Zemplén County, published in Észak-magyarországi Stratégiai Füzetek, 2019 (2). This examination is a revised, expanded version of the mentioned study.*

The concept of social innovation has been widely used in the literature since the 2000s (e.g. Bradford 2003; Phills et al. 2008; Pol &-Ville 2009; Mulgan et al. 2007; Nicholls-Murdock 2012; etc.). The concept tends to be widely debated because it is often considered too general. In this regard, Pol and Ville (2009) note that the concept of social innovation is very important if it is well defined. In contrast to economic innovation, the authors suggest using the term social innovation for social and historical paradigm-changing innovations. It is problematic that there is no generally accepted definition of social innovation (Varga 2017), and some people emphasise the 'rubber bone' characteristic of the concept (Pankucsi 2015) which means that some targets of social innovation are only repeated goals until boredom. In addition, social innovation and technical (economic) innovation are closely interrelated. As a result of economic changes, social changes also take place (Varga 2017).

Based on a structured research of the literature, it can be stated that each author defines the concept of social innovation efforts along different interpretative domains. Many authors consider social innovation as a previously non-existent solution to social problems (Mulgan, 2007; Phills et al., 2008; Stewart & Weeks, 2008; Weerawardena & Mort, 2012; Kocziszky et al., 2017). Social innovation offers new answers to social issues while enhancing social interactions. Efforts can be extended to address environmental, health, education, housing and many other societal challenges. Other authors suggest that social innovation is a new form of governance and decision-making (Mulgan et al., 2008; The World Bank-EC, 2015; García et al., 2015; Lessa et al., 2016; Varga, 2017; Majorné Vén, 2018; Radecki, 2018). In this interpretation, initiatives seek to engage individuals and offer solutions to various social problems through novel collaborations.

Taking into account the history of literature, we consider the following definition of social innovation to be guiding: 'Social innovation provides new or novel answers to problems in a community with the aim of increasing the well-being of the community. Social innovation potential is the set of skills that create opportunities for social innovation.' (Kociszky et al. 2017, p. 16)

The conceptualisation of social innovation and the determination of its measurement levels are relevant challenges; however, these issues are only partially covered by the sources on the topic. The concept of social innovation focuses on meeting the needs of the community, emphasizing the social benefits of problem-solving innovative ideas that can be interpreted locally, at the community level. The measurement process of micro-level social innovation is complicated by several factors. The starting point for measuring innovation is determining appropriate indicators and their identification as input, output or impact indicators, referring to the process of systemicity. Indicators that help measure micro-level social innovation initiatives can be identified as preconditions, conditions for achievement and sustainability conditions, defining the structured conditions of the innovation process per phase (Veresné Somosi & Varga, 2018). Preconditions make it possible to define the innovations that appear as a starting factor in the convergence process. The conditions for achievement are factors that play a key role in the catch-up process in the realization of successful social innovations In the short term, the innovation process is effective when as its result social transformation and community response to social problems occur. Sustainability conditions ensure the long-term success of the catching-up process as a means of renewing and transforming society.

An approach to social innovation potential leads us to the issue of social resilience (Kozma 2017). In this context, we get to the phenomena of social resilience. The practitioners of this research area analyse the responses related to the environmental, social, and economic disaster as well as the community responses to it.

In the light of the available statistical indicators, our goal was not about the implementation of social innovation or its socio-economic effects. Based on our possibilities, we can only measure the basis of the realization of social innovation, the potential of the ability to do so, and we tried to compile an indicator system for this. Our results must be evaluated within these limits, i.e. we do not talk about the potential for social innovation in our work, even if we do not indicate it separately.

DATA AND METHODS

Development of an Indicator System

Based on Benedek et al. 2015, we developed an indicator system for measuring social innovation potential. The source of the data is the Hungarian Central Statistical Office. The indicator system consists of three parts: input, output and impact indicators. In our study 8 indicators were assigned to each of the three groups. The indicators were compiled for the settlements of Borsod-Abaúj-Zemplén County for the period of 2014–2017, and in some cases data from 2011 census were taken into account. To filter out year-on-year fluctuations, we took the four-year average into account when developing the system, so that we can conduct a valid test of the ability to innovate.

When developing the system of indicators, it had to be taken into account that the indicators do not point in one direction. For example, a lower value of unemployment rate is a positive (favourable) result, while in terms of project payment per capita the higher the value, the more positive the situation is for social innovation. For those indicators where low values are favourable, reciprocal indicators were calculated.

In each indicator set, the indicators were normalized in order to make our data of different scales comparable. The average of normalized data for each set of indicators was calculated. We calculated a complex indicator measuring social innovation from the average of the three indicator sets.

The input indicators are the following:

1. Number of non-governmental organizations (NGOs) per 10,000 inhabitants
2. Number of active companies per 1,000 inhabitants
3. Number of non-profit organizations per 1,000 inhabitants
4. Proportion of children in the population
5. Number of elderly per 100 children
6. Dependency ratio: children (aged zero to 14) and elderly (age 65 and above) as a percentage of the total population aged 15 to 64)
7. Activity rate (taxpayers/population * 100)
8. Average number of completed years of education, 2011

The output indicators are the following:

1. Payout per capita (2007–2013)
2. Proportion of the public employees compared to the population aged 15–64
3. Number of participants in cultural events per thousand persons 1,000 inhabitants
4. Proportion of people living in segregation
5. Number of persons receiving social catering service per 1,000 inhabitants
6. Number of recipients of home care assistance per 1,000 inhabitants
7. Unemployment rate
8. Average patient turnover per GP and pediatrician

The impact indicators are the following:

1. Annual average income per capita (thousand HUF)
2. Percentage of population with primary education over 7 years (including early school leavers)
3. Proportion of one-person households
4. Proportion of families with three or more children
5. Number of registered crimes per 1000 inhabitants
6. Number of beds in institutions providing long-term residential care per 1000 inhabitants
7. Proportion of taxpayers earning in the 0 HUF to1 million HUF income band
8. Proportion of regularly cleaned public areas.

For describing each of the indicators, we presented a general map and map of spatial clusters.

During the study we used the local method of spatial autocorrelation, Local Moran I statistics. Local Moran statistics are suitable for illustration areas that are similar or different from their neighbours (Tóth, 2014). In the calculations, the result of Local Moran can be compared with the absolute data and thus it can be examined whether a high degree of similarity is the concentration of high or low values of the variable, and vice versa. The higher the value of Local Moran I, the tighter the spatial similarity, however, in the case of a negative value, it can be stated that the spatial distribution of the variables is close to the random one.

Local Moran I statistics define 4 clusters:

1. High – high cluster: territorial units with a high value, for which the neighborhood also has a high value.
2. High – low cluster: high value area units for which the neighborhood has a low value.
3. Low – low cluster: low value area units where the neighborhood also has a low value.
4. Low – high cluster: units with a low value for which the neighborhood has a high value.

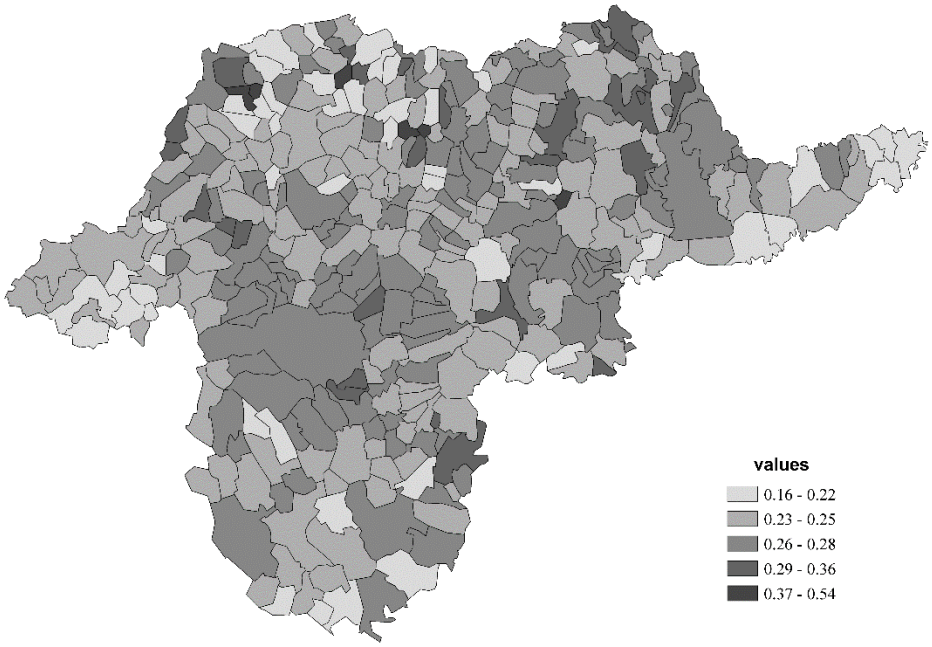
The neighborhood was defined as rook contiguity, when only common sides of the polygons are considered to define the neighbor relation.

RESULTS

Spatial Context

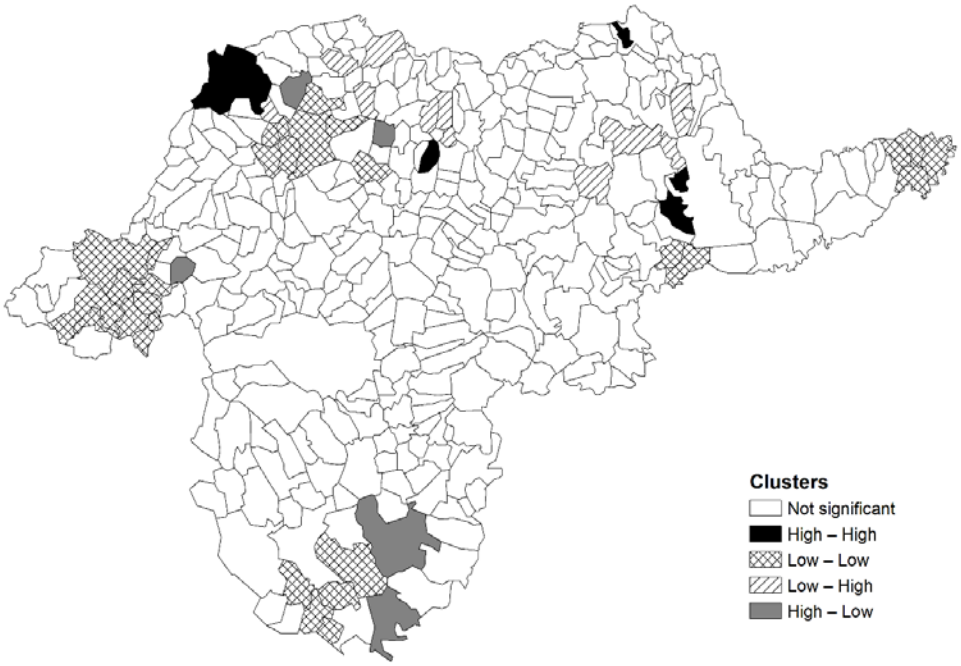
Figure 1 displays the input indicators for each of the settlements in the county. The highest values can be seen in some small villages in the county (Tornakapolis, Tornabarakony, Teresztenye). These settlements stand out as islands, as the settlements with the lowest values are directly adjacent to them. In general, it can be seen that the settlements with the lowest values are located near the county or country border, that is, on the periphery of the county.

Out of the eight settlements with more than 10,000 inhabitants (Miskolc, Ózd, Kazincbarcika, Mezőkövesd, Tiszaújváros, Sátoraljaújhely, Sárospatak, Sajószentpéter), Tiszaújváros is in the most favourable position, and six towns show values above average. In contrast, Ózd and Sajószentpéter are well below average in terms of the average of input indicators.



Source: own compilation

Figure 1. Input indicators in Borsod-Abaúj-Zemplén county

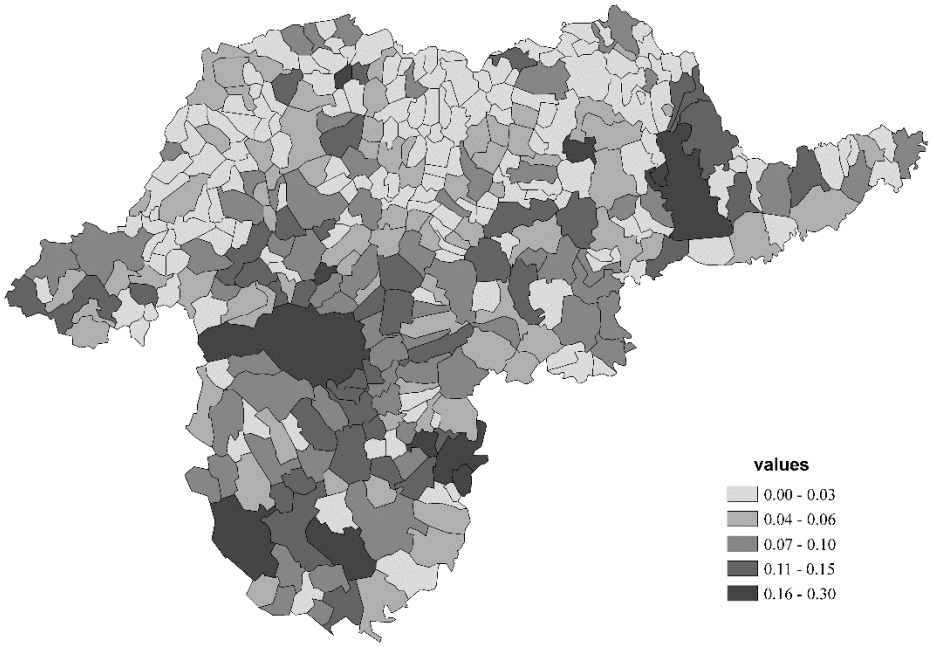


Source: own compilation

Figure 2. Local Moran I of input indicators in Borsod-Abaúj-Zemplén county

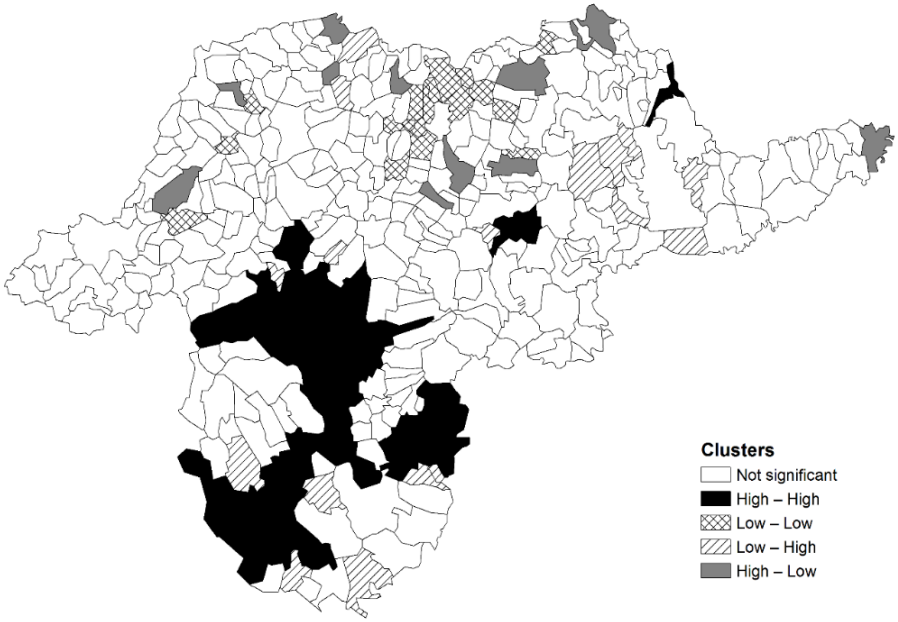
Only a few spatial clusters can be detected in the county (Figure 2). Only the area of Aggtelek-Jósvafő can be clearly classified as the most favourable high-high cluster. Apart from them, we can observe only some smaller clusters spatially. The low-low cluster stands out even more: it is mainly limited to the peripheral settlements of the county. In some cases, so-called outliers are drawn that are different from their environment in a positive or a negative direction, but little regularity can be observed in their location.

With a few exceptions (Figure 3), larger municipalities are in the best position with regard to output indicators. The highest values can be seen in the case of Tiszaújváros, while the lowest values are in the northern periphery of the county (Pusztaradvány, Szászfa, Hernádcéce). In the case of the larger cities, Ózd is in the most unfavourable position, though still with a higher value than the county average.



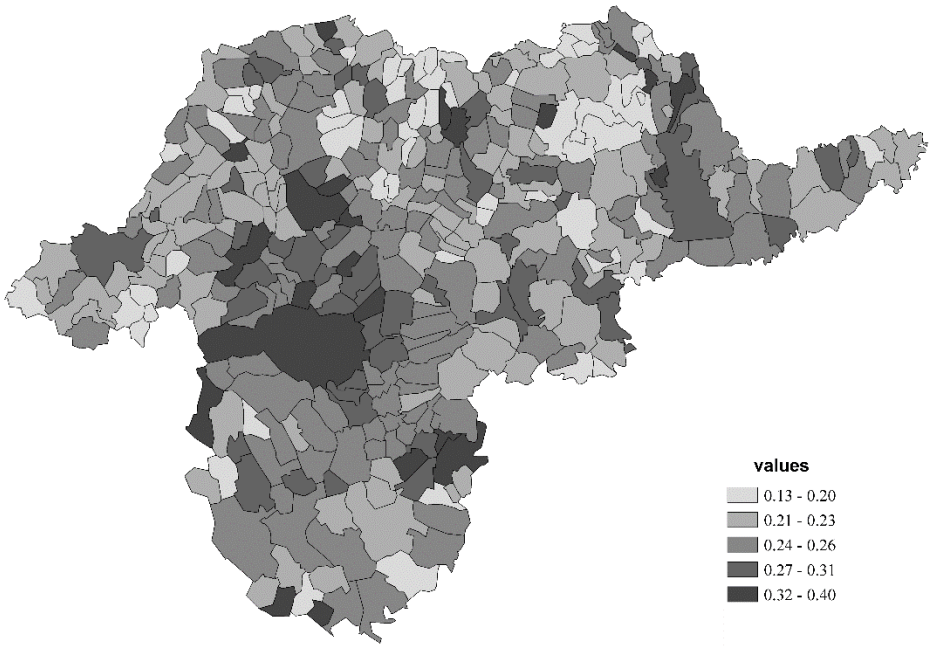
Source: own compilation

Figure 3. Output indicators in Borsod-Abaúj-Zemplén county



Source: own compilation

Figure 4. Local Moran I of output indicators in Borsod-Abaúj-Zemplén county



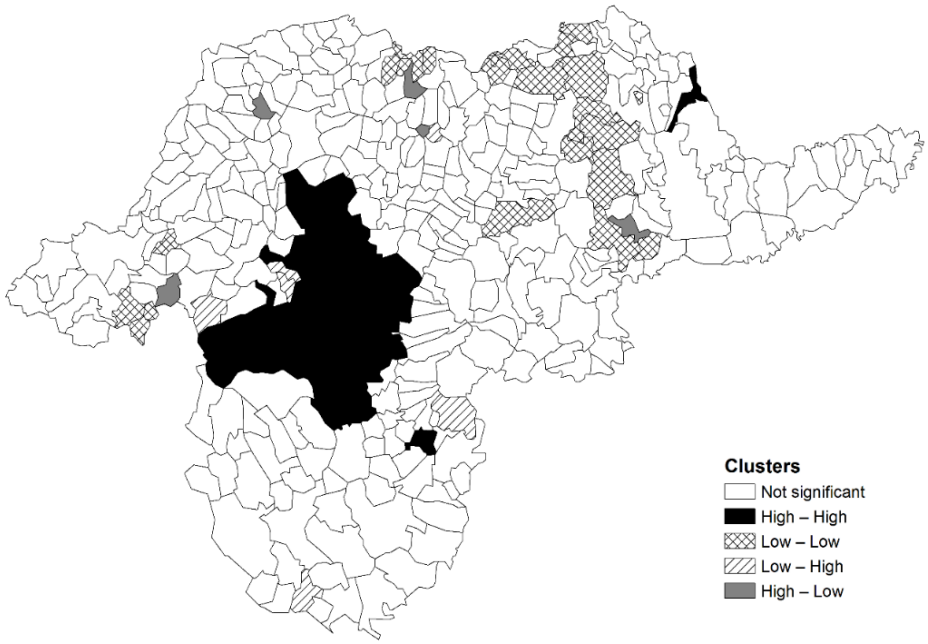
Source: own compilation

Figure 5. Impact indicators in Borsod-Abaúj-Zemplén county

In terms of output indicators, spatial clusters are much more prominent than we have seen with input indicators (Figure 4). The Miskolc agglomeration and the surroundings of Tiszaújváros and Mezőkövesd were placed in the high-high cluster. The low-low cluster of unfavourable position includes the settlements of the Encs district.

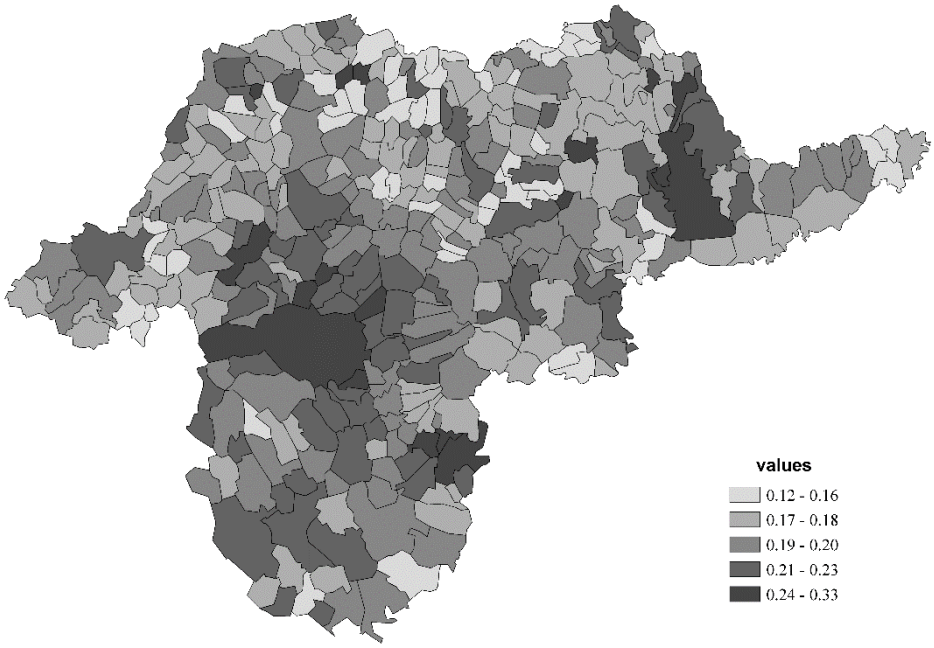
In case of impact indicators (Figure 5), the settlements with the highest values are relatively sporadically located within the county. The highest values can be seen in Hercegkút, while the lowest values can be seen in Galvács. Among the settlements with more than ten thousand inhabitants the highest values can be seen in Miskolc, while the lowest values can be seen in Mezőkövesd. However, the value of Mezőkövesd is lower than the county average.

The high-high cluster is limited to the Miskolc agglomeration and the neighbouring settlements to the north in terms of impact indicators. The low-low cluster, which is quite spectacularly connected spatially, appears along the Hidasnémeti-Zalkod axis in the spatial structure of the county (Figure 6).



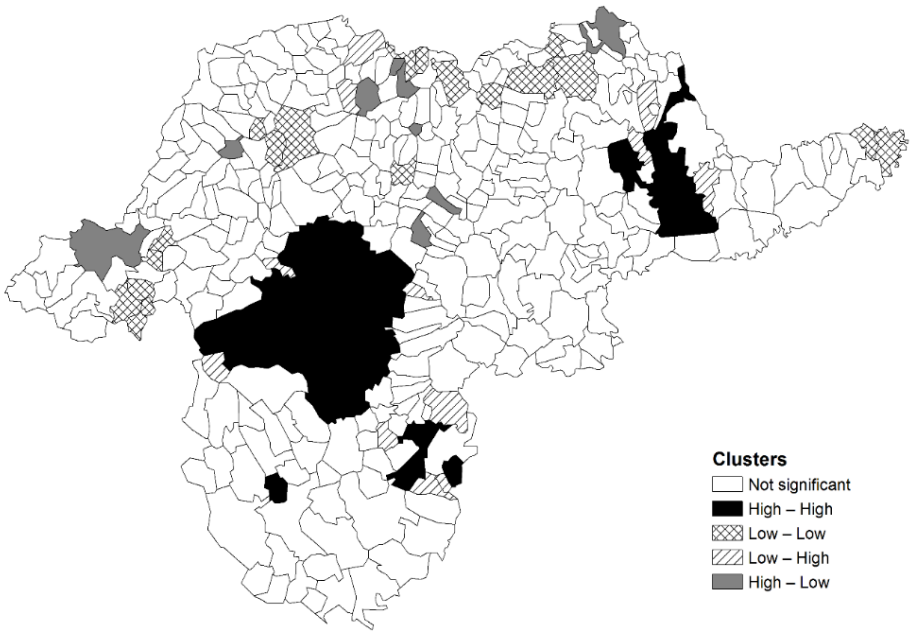
Source: own compilation

Figure 6. Local Moran I of impact indicators in Borsod-Abaúj-Zemplén county



Source: own compilation

Figure 7. Complex indicator measuring social innovation in Borsod-Abaúj-Zemplén county



Source: own compilation

Figure 8. Local Moran I of complex indicator measuring social innovation in Borsod-Abaúj-Zemplén county

Looking at the complex indicator in total (Figure 7), it can be stated that although the settlements in the most favourable condition are relatively scattered in the county, the role of proximity to the most important cities is clear (Miskolc, Tiszaújváros, etc.). The highest values are seen in Tornabarakony, the lowest values in Pányok. The value of all cities with more than ten thousand inhabitants is above the county average. Of these, Tiszaújváros is in the best situation, while Ózd is in the most unfavourable.

The high-high cluster is basically connected to the Miskolc agglomeration and to the surroundings of Sárospatak and Tiszaújváros (Figure 8). In contrast, several groups of settlements with small villages belong to the low-low cluster in the worst position near the country border.

Spatial Differences of the Complex Indicator

Theoretically, it would follow from our method that each group of indicators determines the complex indicator and its territorial differences to the same extent. To investigate this, we analyzed the spatial differences of the complex indicator and its components using basic descriptive statistics as well as using the Gini index. Our results are reported in Table 1 and 2.

$$G = \frac{1}{2\bar{x}n^2}\sum_i\sum_j\left|x_i - x_j\right|$$

where xi = area characteristics in natural units in the area unit i; xj = area characteristics in natural units in the area unit j;
$\bar{x}$ = average of xi, n is the number of area units.

We found that in the case of the output indicators, there is an extremely high spatial difference between the examined indices, while the spatial image is much more balanced with regard to the input and impact components and the complex indices.

That is, in summary, we can state that the spatial differences of the complex indicator are mainly determined by the output indicator. Thus, in the development of the social innovation potential, in our opinion, this area should be paid the most attention in order to make effective developments.

Table 1
Statistical characteristics of the complex indicator and its components

Indicators	Input	Output	Impact	Complex
Max	0.54	0.33	0.40	0.33
Min	0.16	0.01	0.13	0.12
Average	0.25	0.06	0.24	0.18
Relative standard deviation %	14.34	79.38	18.19	15.73

Source: own calculation

Table 2
Spatial differences of the components of the indicator

Indicators	Input	Output	Impact	Complex
Gini index	0.07	0.40	0.10	0.08

Source: own calculation

CONCLUSION

Based on the examined measurement methods of the literature, it can be stated that a number of experiments can be identified, which focus on measuring the social innovation process and determining social innovation potential; however, there is no uniformly accepted methodology. As in the case of the concept of social innovation, the examination of social initiatives and the definition of its measurement indicators require a comprehensive analysis. The predominance of the examination of macro-level initiatives is typical, but the methods aimed at quantifying the process and effects of local-level efforts are appearing with increasing intensity. A significant part of these calculations attempts to fit the indicators involved in the macro-level study to the local measurement.

In our study we try to measure the potential for social innovation in the example of the settlements of Borsod-Abaúj-Zemplén County, Hungary. With the help of input, output and impact indicators, we mapped the socio-economic indicators that examine the basis of social innovation potential. We have shown that Miskolc and its agglomeration, Sárospatak and Tiszaújváros are in the best position in terms of social innovation potential within the county. We found that the regional differences of the complex indicator are mostly determined by the output indicators.

Our further research questions in this area are the relationship of income distribution and territorial development disparities to social innovation potential and the relationship between population change and social innovation potential. These issues, in addition to the above studies, will be presented in further studies.

Acknowledgement

This research was supported by the project no. EFOP-3.6.2-16-2017-00007, titled Aspects on the development of intelligent, sustainable and inclusive society: social, technological, innovation networks in employment and digital economy. The project has been supported by the European Union, co-financed by the European Social Fund and the budget of Hungary.

REFERENCES

BENEDEK, J.–KOCZISZKY, GY.–VERESNÉ SOMOSI, M.–BALATON, K. (2015): Regionális társadalmi innováció generálása szakértői rendszer segítségével (Generating regional social innovation through expert system) Észak-magyarországi Stratégiai Füzetek 12 (2): 4–22.

BRADFORD, N. J. (2003) Cities and Communities That Work: Innovative Practices, Enabling Policies. Ottawa, Ontario: Canadian Policy Research Network.

EC (2013a): Communication From the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of The Regions – Towards Social Investment for Growth and Cohesion – including implementing the European Social Fund 2014-2020 https://ec.europa.eu/eip/ageing/file/751/download_en?token=FWCEa1Qk (download: 09/2019)

EC (2013b): Social innovation research in the European Union: approaches, findings and future directions – Policy Review, European Union, http://www.net4society.eu/_media/social_innovation.pdf (download: 03/2017)

EC (2014): Social innovation – A Decade of Changes, European Union, http://espas.eu/orbis/sites/default/files/generated/document/en/social_innovation_decade_of_changes.pdf (letöltés ideje: 2018. 03. 23.)

GARCÍA, M.–EIZAGUIRRE, S.–PRADEL, M. (2015): Social innovation and creativity in cities: A socially inclusive governance approach in two peripheral spaces of Barcelona. City, Culture and Society, 6, pp. 93-100. https://doi.org/10.1016/j.ccs.2015.07.001

KOCZISZKY, GY. – VERESNÉ SOMOSI, M – BALATON, K. (2017): A társadalmi innováció vizsgálatának tapasztalatai és fejlesztési lehetőségei (Experiences and opportunities for developing social innovation) Vezetéstudomány / Budapest Management Review 48 (6-7): 15–19. https://doi.org/10.14267/veztud.2017.06.02

KOZMA, T. (2017) Reziliens közösségek – reziliens társadalom? (Resilient Communities - Resilient Society?) Educatio®, 26(4): 517–527. https://doi.org/10.1556/2063.26.2017.4.1

LESSA, B. S.–SOUZA, A. C. A. A.–SILVA-FILHO, J. C. L. (2016): Education in cooperative cells as a social innovation: a case study in the Brazilian semiarid, RAI Revista de Administração e Inovação 13. pp. 166-175. https://doi.org/10.1016/j.rai.2016.06.004

MAJORNÉ VÉN, M. (2018): URBACT III Európai Városfejlesztési Program – Városfejlesztés nem „csak" okosan, előadás (URBACT III European Urban Development Program - Urban Development is not just 'smart', lecture), SMART City Konferencia, Miskolc

MULGAN, G.–TUCKER, S.–ALI, R.–SANDERS, B. (2007) Social Innovation: What It Is, Why It Matters and How It Can Be Accelerated. Skoll Centre for Social Entrepreneurship Working paper. London, Basington Press. Available at http://eureka.sbs.ox.ac.uk. NICHOLLS, A. – MURDOCK, A. (2012) The Nature of Social Innovation. In: Nicholls, A. – Murdock, A. (eds) Social Innovation. London, Palgrave Macmillan. https://doi.org/10.1057/9780230367098_1

MULGAN, G. – BACON, N. – FAIZULLAH, N. – WOODCRAFT, S. (2008): Transformers: How local areas innovate to address changing social needs, The Young Foundation, London: NESTA – National Endowment for Science: Technology and the Arts

OECD AND THE WORLD BANK (2012): Promoting Inclusive Growth: Challenges and Policies, OECD Publishing, Paris https://doi.org/10.1787/9789264168305-en

OECD LEED (2000): Forum on Social Innovations, https://www.oecd.org/fr/cfe/leed/forum-social-innovations.htm (letöltés ideje: 2019. 07. 12.)

PANKUCSI, M. (2015): Társadalmi innováció, a szegénység leküzdése és az emberi tőke (Social innovation, poverty overcoming and human capital) Észak-magyarországi stratégiai füzetek 12 (2): 23–32.

PHILLS, J. A.– DEIGLMEIER, K. – MILLER, D. T. (2008) Rediscovering Social Innovation. Stanford Social Innovation Review 6 (4): 34–43.

POL, E.–VILLE, S. (2009) Social Innovation: Buzz Word or Enduring Term? The Journal of Socio-Economics 38 (6): 878–885. https://doi.org/10.1016/j.socec.2009.02.011

RADECKI, A. (2018): Connected solutions help us solve global challenges in cities! lecture, SMART City Konferencia, Miskolc

SABATO S., B. VANHERCKE AND G. VERSCHRAEGEN (2015), The EU framework for social innovation - Between entrepreneurship and policy experimentation, ImPRovE Working Paper No. 15/21. Antwerp: Herman Deleeck Centre for Social Policy – University of Antwerp

STEWART-WEEKS, M. (2008): Social innovation: flavoursome fad or future fix? Social Innovation eXchange

THE WORLD BANK – EC (2015): Kézikönyv – A roma közösségek életkörülményeinek javítása helyi szinten (Handbook - Improving the living conditions of Roma communities at local level), IBRD – IDA, WORLD BANK GROUP

TÓTH, G. (2014): Térinformatika a gyakorlatban közgazdászoknak (GIS in practice for economists), Miskolci Egyetemi Kiadó, Miskolc

VARGA, K: (2017): Társadalmi innováció és versenyképesség mérése (Measuring social innovation and competitiveness) MultiScience - XXXI. microCAD International Multidisciplinary Scientific Conference University of Miskolc, Hungary, 20-21 April 2017 https://doi.org/10.26649/musci.2017.125

VERESNÉ SOMOSI M. – VARGA K. (2018): How does social innovation contribute to solving social problems?- A processoriented framework for measuring social innovation, European Journal of Social Sciences, Education and Research, Volume 12, Nr. 1, ISSN 2411-9563 (print), pp. 68-83. https://doi.org/10.2478/ejser-2018-0007

WEERAWARDENA, J. – MORT G. S. (2012): Competitive Strategy in Socially Entrepreneurial Nonprofit Organizations: Innovation and Differentiation, Journal of Public Policy and Marketing, 31 (1), pp. 91-101. https://doi.org/10.1509/jppm.11.034