The role of endogenous capital factors in the territorial development of the Sellye District in Hungary

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This study aims to present the endogenous developmental potential of the Sellye district. We examine the state of the internal capital factors of the area as well as determine indicators that can reveal the spatial structural characteristics of these factors. The main types of settlements of the district, along with the elements above were identified through a cluster analysis based on secondary statistical data. A hierarchical cluster analysis and Ward's method were used to form the clusters. The results show that the endogenous developmental potential of the Sellye district is low; the effects of the socio-economic problems of the area are reflected in almost all of the examined capital factors. This is especially true for the most disadvantaged and least populated settlements of the district.

Introduction

In recent decades, the issue of endogenous development and territorial capital has been one of the key areas of research in regional sciences and applied territorial development. As a result of the economic transformation of the 1990s, developmental strategies that prioritised the development and utilisation of local potentials in the region came to the fore. The advantage of this approach, in addition to the reduction in dependence on external sources, is a greater degree of autonomy and an appreciation of the role of bottom-up local needs. Endogenous sources of regional potential are the potential capital, the endowments of the local workforce, the state and level of equipment in the infrastructure, the spatial position, the state and quality of the local environment, the market relations, the

socio-cultural endowments, and the local decision-making and institutional system (Rechnitzer 1993).

Territorial capital is one of the most popular topics in regional research. However, a generally accepted definition has not been established so far (Jóna 2013, Tóth 2013). One of its first appearances in the study of endogenous development based on territorial capital was in the work of the Organisation for Economic Co-operation and Development (OECD 2001) entitled 'Territorial Outlook'. According to this work, each region has a unique territorial capital – unique in that it provides a different return on certain investments at different points in the local space, where these investments match local opportunities better and make better use of them. The work also includes a division of territorial capital factors into three types. Based on these elements, we can distinguish among material (physical) factors, non-visible connections, and intangible (invisible) factors. The territorial capital model also pays considerable attention to the background conditions of endogenous development, which have a considerable impact on regional competitiveness.

The local actors are of paramount importance in the impact of territorial capital on the spatial differentiation of economic potential, as they can use their resources more efficiently and reduce the risk inherent in their decisions through their knowledge of the local conditions. Territorial cohesion, which includes environmental quality, territorial efficiency and territorial identity as well, can be a key factor in the competitiveness of regions. Endogenous resources can be divided into traditional and innovative elements. The former group includes private and social fixed capital stock, natural and cultural resources, the infrastructure, human and social capital. The latter includes relationship capital, corporate and R&D cooperation, networks, interconnection, receptivity and economies of agglomeration. Together, these factors contribute to the development of an area's image (Camagni 2008, 2009).

Research centered around measuring territorial capital has primarily focused on the relationship between territorial capital and economic growth. The main indicators analysed through surveys were territoriality, natural resources, educational level of the local population, intellectual capital, the proportion of intellectual employees, the performance of the local economy, the state of infrastructure, the private capital stock, civic activity, the local government, the institutional system and the social situation (Brasili et al. 2012, Camagni 2009, Capello 2011, Jóna 2015, Polish 2012, Caruso–Conto 2018).

In parallel with the economic and social erosion of Hungarian rural areas, the resource drain of the central areas that occurred partly as a result of the trend has become an observable process. Development based on internal resources can be a response to this situation, which can appear as a new impetus for maintaining the livelihood of the countryside (Káposzta 2014, Nagy-Molnár–Lendvay 2018). In Hungary, in endogenous development studies, the issue of the development of rural

areas based on internal resources appears with a greater emphasis than in the international literature. In the growth approach to endogenous development, instead of quantitative factors, social progress and qualitative change come to the fore. As endogenous development means exploring and exploiting the local potential of areas, it can play an important role in rural areas. This is especially true for rural areas where unfavourable changes could not be offset by the economic power of the surrounding cities (Bodnár 2013).

Following the systematisation of endogenous development models, the basic types of endogenous capital emerged. Of these, the most dominant are private equity and human, social, natural, cultural, relational and infrastructure capital. The decline of the Hungarian countryside is also reflected in the capital factors of endogenous development. In the study of material capital factors (private equity, business environment, and infrastructure), the economically developed and underdeveloped areas can be well-separated geographically. In the case of intangible capital factors, a similar pattern emerges mainly in the study of social capital. In the case of human capital, few districts can be considered as developed, while the development of cultural capital shows a negative picture in comparison (Bodnár 2016, Kovács–Bognár 2017).

In the study of the endogenous development of the Hungarian countryside, an opinion was expressed, namely that the methods of territorial capital used so far cannot be used in our case, as they contain capital factors that cannot be interpreted in the case of the countryside. In the study of rural territorial capital, soft factors that can only be detected using complex, empirical methods are extremely important (Ludescher 2016).

The present study aims to investigate the development of the Sellye district based on endogenous capital factors. This is achieved through the following sub-objectives: an important goal is to analyse the most relevant domestic and international scientific studies related to this research, the topics of which are endogenous development, the endogenous development of rural areas, regional development, and territorial capital. We aim to determine statistical indicators in order to measure the capital factors of endogenous development in the settlements of Sellye district. We aim to analyse the characteristic groups and clusters of the settlements of the examined area in terms of the most important endogenous capital factors by analysing these statistical indicators. Finally, our main goal is to explore the spatial structural characteristics of the development of certain endogenous capital factors by spatially representing the results of the cluster analysis.

Research methods

Both secondary and primary data sources were used to achieve the objectives of the present study. The secondary sources used included the analysed literature, from

which we selected Hungarian and international studies that deal with endogenous development, endogenous capital factors, territorial capital and their role in the development of rural areas.

We begin with the approach of the international literature that uses territorial capital in the interpretation of endogenous development. According to this, each area has its own unique endowments and opportunities that determine the area's image and competitiveness (Capello 2008, OECD 2001).

The second part of the secondary sources was the processed statistical data. The starting point of the study was the work of Péter Kovács and Gábor Bodnár (2017) titled 'Examining the Factors of Endogenous Development in Hungarian Rural Areas by Means of PLS Path Analysis'. The aforementioned work analysed the most common types of capital in the international literature on the endogenous development of the rural districts of Hungary through indicators defined by the authors. A partial least squares path analysis was performed using SmartPLS 3.0 software, integrating the capital factor indicators. The aim of the regression model created by using the variables was to explore the effects of individual capital factors on the well-being of rural areas.

Based on the above, we compiled a list of indicators exploring the state of the endogenous capital factors of the Sellye district, in a way that is in line with the objectives of this study and the local conditions. In the settlement-level statistical analysis we performed the calculations with the relative values of each indicator per thousand inhabitants, which allowed us to compare settlements with significantly different populations. Since the year with the most recent data available for most of the indicators was 2017, this year was also selected for the other indicators. In case of exceptions, the latest available data were used (Criminal Statistics System [Ministry of the Interior BSR]; Land Registry Portal; Central Statistical Office [CSO]; National Employment Service [NES]; OpenStreetMap; National Spatial Development Information System [TeIR]; Volánbusz). The resulting sample was analysed by cluster analysis. The aim of the cluster analysis was to group the examined elements based on the patterns of specific variables. Clusters were formed using a hierarchical cluster analysis, the Ward method and squared Euclidean distance. The selected indicators were standardised. Standardisation allowed us to compare different variables by converting different scales to a common scale. The mean and standard deviation of the standardised scales were 0 and 1 respectively (Csallner 2015, Takács et al. 2015). The individual clusters differed significantly across the indicators included in the statistical analysis.

The cluster analysis of the available data was performed by the IBM SPSS Statistics 14.0.0 software. The endogenous capital factors (tangible: private equity, business environment, and infrastructural and natural capital; and intangible: social, human, cultural, and relational capital) were displayed by using QGIS 3.4.7. software based on OpenStreetMap maps.

Results: Types of tangible capital

Private equity

In the analysis of private equity in Sellye district, by using indicators of the financial situation of the local population, three clusters emerged. The cluster labelled as '1' is characterised by a net income per capita lower than the average of the district, the total number of taxpayers per thousand people, and the number of cars per thousand people. The most significant lag can be observed in the case of the last indicator, because its value does not reach 50% of the district average. Taking all of this into account, it can be concluded that the cluster represents a disadvantaged position in terms of private equity. Three of the four settlements belonging to this cluster – Hirics, Drávaiványi, and Drávakeresztúr – are characterised by their peripheral location along the border, while the fourth settlement, Gilvánfa, can be considered as one of the poorest settlements on the national level. The members of the cluster labelled as '2' are characterised by values close to the district average for all three private equity indicators. The nineteen settlements in this cluster show a rather heterogeneous picture in terms of population, from Markóc exhibiting the smallest population number to Bogádmindszent with almost half thousand inhabitants. The cluster labelled as '3' includes the settlements with the highest private equity potential in the district, which perform well above the district average in terms of all three aforementioned indicators. The representation of the cluster in the spatial structure of the district clearly shows the settlements impacted by the most important traffic routes of the district, which, in several cases, are characterised by a higher population and the presence of central functions. This cluster also includes Kemse and Tengeri, which are the second- and third-smallest municipalities of the district. This result is also remarkable because, in addition to the relative values, the absolute ones are also exceptional (Appendix Figure 1).

The business environment

Four indicators were included in the statistical analysis of the business environment, on the basis of which five well-separated clusters of the settlements were defined in the region. A common feature of the settlements in the cluster labelled '1' is the lower degree of entrepreneurial intensity, which is also reflected in the number of enterprises, joint ventures, and licensed traditional small-scale producers. Within this cluster, the settlement of Gilvánfa is characterised by an exceptionally low value. The two settlements in the cluster labelled '2', similar to the ones in cluster '1', are characterised by a business intensity that lags behind the district average. However, an important difference is that the number of enterprises and licensed traditional small-scale producers significantly exceeds the corresponding values in the first cluster. The cluster labelled '3' is characterised by values close to the average for each indicator examined. From the large number of settlements in this cluster it is

clear that although Sellye and the larger settlements of the district clearly stand out in terms of absolute values, the population-based analysis of the entrepreneurial environment of the district gives a fundamentally unified picture of the area.

The settlements in the cluster labelled '4' are characterised by a more intensive entrepreneurial environment than the district average, indicated by the large number of sole proprietors and licensed traditional small-scale producers. In parallel, the number of partnerships remains below the district average, which can be explained, among other things, by the importance of the role of agricultural enterprises. The values of the cluster labelled '5' evidence an entrepreneurial environment with exceptional activity from the point of view of the district. Similar to the case of private equity, exceptional values can be observed in Kemse and Tengeri, where, similarly to the above, the effect of a low population on the indicator also plays a role (Appendix Figure 2).

Infrastructural capital

In order to examine the infrastructural capital in the district of Sellye, two indicators were used. The first was the proportion of Internet subscribers, which, due to the prevalence of the service and its current role, is suitable for comparing settlements that may be considered technically less developed. The other indicator included in the analysis was the proportion of public service providers, which examines the settlements of the district based on the existence of a joint municipal office, a primary school, a post office, and a general practitioner service, thus providing a comprehensive picture of the state of 'soft' infrastructure. From the analysis three groups emerged. In clusters '1' and '2', the human public services we examined were practically non-existent or very limited; the separation of the two clusters was due to their difference in the proportion of Internet subscribers. In cluster '1', the value of the indicator was significantly lower than the district average, while in cluster '2', the value was above the average. The first two clusters included more than 70% of the examined settlements. The population of these settlements may need the infrastructure of the settlements in cluster '3', in several respects with regard to the services mentioned above. Similarly to the case of private equity, in the latter cluster appear the most populous settlements of the district, where a high density of institutions and technical infrastructural elements can also be observed (Appendix Figure 3).

Natural capital

The study of the natural capital accumulation of the Sellye district aimed to assess the potential of agriculture and forestry due to the characteristics of the area. Crop production and forestry are the most important elements of the district's economy. Based on the two variables included in the analysis (ratio of forest area to arable land per thousand inhabitants), three groups emerged. Overall, the area as a whole

has extensive arable and forest land. Cluster '1' includes almost 70% of the settlements in the district. What they have in common is low values for both indicators in terms of district conditions. Cluster '2' consists of settlements with an average amount of arable land, that is, the size of arable land per thousand inhabitants. The settlements in cluster '3' are characterised by values well above the district average in both indicators, in terms of forest area and arable land, mainly due to the ratio of population to settlement area and to the smaller size of inner areas (Appendix Figure 4).

Results: Types of intangible capital

Social capital

Four indicators were included in the study of the social capital situation in the Sellye district, based on which four clusters were formed. Cluster '1' is characterised by the smallest social capital. With the exception of the number of jobseekers, the settlements exhibit values below the district average for the examined indicators. In these settlements one of the most significant problems in this dimension is clearly the emigration. The population retention capacity of the villages in this cluster is low. The significant rate of domestic migration involves mainly those who are younger, more educated and in a more favourable financial situation – in other words, the more mobile population. This endangers the future of these settlements in the long run, carrying the possibility of an ageing population and depopulation (see Daugirdas–Pociute-Sereikiene 2018). Cluster '2', as before, is characterised by a lower level of social capital; in this case however, the most significant challenge is posed by the high proportion of offenders and jobseekers. For the cluster as a whole, the values of both indicators are twice as high as the respective district averages. The settlements in the third cluster are characterised by an average proportion of job seekers and offenders in relation to that of the district. It is important to emphasise that the settlements in this cluster are the least affected by emigration, which can also be explained by the unfavourable mobility situation of the population. The settlements in cluster '4' have the highest social capital within the district. Their low proportion of jobseekers is coupled with a remarkably large number of non-profit organisations and a number of offenders just above 50% of the district average for the cluster as a whole. A common feature of the settlements in this cluster is that the rate of domestic emigration is higher than the district average. Based on the spatial distribution of the clusters, the settlements affected by the main transport routes appear as above (Appendix Figure 5).

Human capital

In the analysis of the level of human capital accumulation in the Sellye district, four clusters were formed, based on the relative change of two variables compared to each other. Cluster '1' consisted of settlements with a lower share of people with higher education and high demographic potential. Three of the settlements in the cluster (Drávaiványi, Gilvánfa, and Hirics) were placed in the most unfavourable clusters based on the analysis of several capital factors, which clearly shows the complexity of the problems causing the unfavourable situation in these settlements. Cluster '2' has human capital endowments similar to those in cluster '1': the proportion of people with a higher education degree is lower than the district average; however, this is coupled with a large number of young people. Nearly half of the settlements in the district fall into this category. Cluster '3' is the group of ageing settlements. Although the proportion of people with a higher education degree is approximately equal to the district average, the proportion of the population aged under 18 is the lowest in the settlements examined. Tengeri, the smallest settlement in the district, can be highlighted as a location where the proportion of the aforementioned age group in the total population remains below 10%. This situation also poses the risk of depopulation. The fourth cluster can be considered the opposite of the first cluster in some respects, since there a highly educated population is coupled with low demographic potential. Four of the six most populated settlements in the district are included in this cluster, which shows that central functions can also significantly help the well-educated population to remain local. At the same time, there is a tendency for children with parents having higher education to leave the district due to the limited number of job opportunities, a phenomenon that can only be offset to some extent by the attraction of intellectuals from the surrounding settlements. The settlement of Markóc is also included in this cluster: despite its small population, it has a significant intellectual stratum at the regional level (Appendix Figure 6).

Cultural capital

The statistical analysis of the cultural capital potential of the Sellye district presented a serious challenge due to the small number of available indicators. Finally, based on the indicators analysed, four clusters emerged. It is important to note that each of the indicators involved reflects the state of a settlement in a single year. However, the number of cultural events and participation in them may vary significantly from year to year due to the variability of the funding sources available and the accuracy of the data. Therefore the results of the investigation, and the outliers in particular should be handled with caution. Cluster '1' includes 70% of the municipalities in the district. Their common feature is that regarding each of the indicators we examined, they lag significantly behind the district average. The cluster also includes the two

most populous settlements in the region with the most central functions: Sellye and Vajszló. The settlements in cluster '2' have favourable indicator values in terms of the proportion of public cultural institutions and cultural events, mainly due to their small population density. The settlements in cluster '3' also stand out with respect to cultural events and participation in them; in both cases, they have around twice the value of the district average. The settlements forming the fourth clusters exhibit values well above the district average on each of the indicators we examined. The indicator of participation in cultural events should be highlighted, where these settlements exhibited values exceeding severalfold the average value of the district. (Appendix Figure 7).

Relational (connection) capital

The last type of capital examined is relational capital, which pertains to the role of settlements in the spatial structure of the district, their connection with commuting centres, and their tourism potential. The analysis of relational capital in the present study was conducted as an analysis of 'connection capital'. The aim was to analyse the factors connecting the settlements to the county and regional settlement network. Based on the five indicators involved, three clusters emerged. The settlements in cluster '1' are characterised by more unfavourable values than the district averages. For these settlements, reaching the values exhibited by the economic, educational, and cultural centre of Pécs would be the most complicated goal (see Tagai et al. 2018). Private and public road transport involves the longest times here due to the geographical location and the endowments of the transport infrastructure. This appears to be a complex problem due to the small number of bus lines and cars, which also have a negative effect on the number of commuters. This is true despite the fact that the settlements classified into this cluster do not have an abundance of job opportunities. The traffic conditions in the settlements in Cluster '2', apart from the number of bus lines, are more favourable than the district average. At the same time, with less than 50%, the proportion of commuters lags far behind the average. The social and human capital analysis provides a basis for understanding this: the settlements in this cluster have been included in clusters characterised by below-average values, even in the case of the two previously mentioned capital factors. Due to the high proportion of jobseekers and the educational level of the population, a higher proportion of the people old enough to work in these settlements work in their own place of residence. Thus, it can be stated that cluster '2' is characterised by low relational intensity, despite its more favourable conditions. Cluster '3' includes the settlements with the highest connection capital potential of the district, which is reflected in all the indicators we have examined. In the analysis of the capital factors, similarly to the factors analysed above, the settlements affected by the busiest traffic routes of the district are

highlighted, which, partly due to their favourable location, have more favourable indicator values than those of most of the studied capital types (Appendix Figure 8).

Conclusions

Summarising the results of the present study, it can be stated that the district of Sellye lags behind the national average in almost all aspects of the examined internal resources. The examination of the material capital factors shows that the underdevelopment of the region can be seen in the financial situation of the population, the condition of the infrastructure, and the people's willingness to engage in entrepreneurship. From the perspective of natural capital alone, conditions in the district can be considered favourable; as a result, the role of agriculture is currently still decisive.

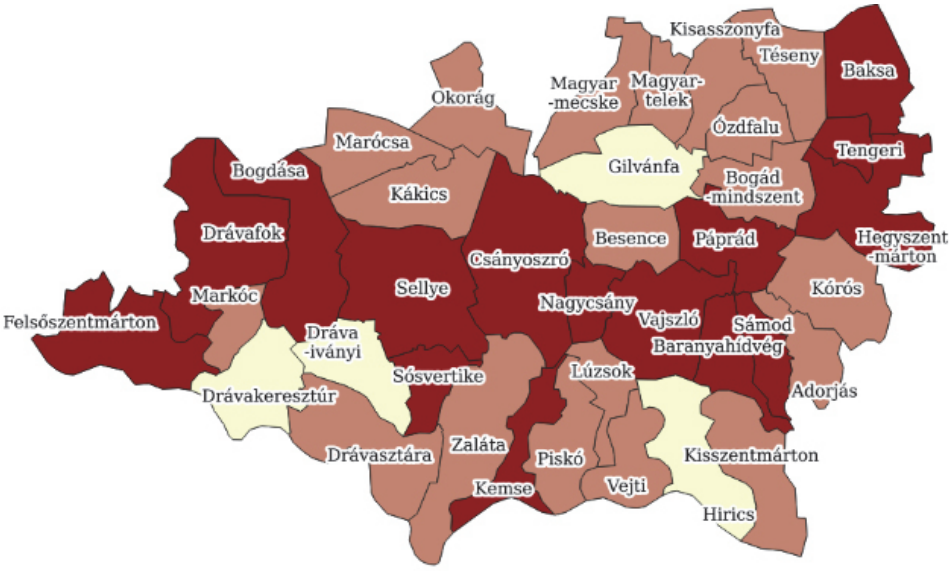
Among the intangible capital factors, it is important to highlight the state of social and human capital. In most of the examined settlements high unemployment and, at the same time the increasing number of crimes emerge as a serious problem. As a result of the socio-economic problems of the district, there is an increasing number of emigrations: the departure of the more educated and highly qualified population has an adverse effect on the economic strength of the district and on the self-organisation and self-advocacy of the local population.

For almost all types of capital, settlements with a larger population and central functions stand out, as well as settlements impacted by major transport routes. These settlements, due to their location and economic potential can participate more effectively in the regional division of labour. Settlements with peripheral locations and low population density are in the worst situation, where the described problems are cumulative. Difficulties in accessing jobs and basic services in disadvantaged settlements also have a negative impact on population retention, which poses a serious problem in a district with fundamentally less favourable demographics.

Appendix

Figure 1

The state of private equity in the district of Sellye, 2017



1 – Low net income per capita, low number of taxpayers per thousand inhabitants, low number of cars per thousand inhabitants (4)

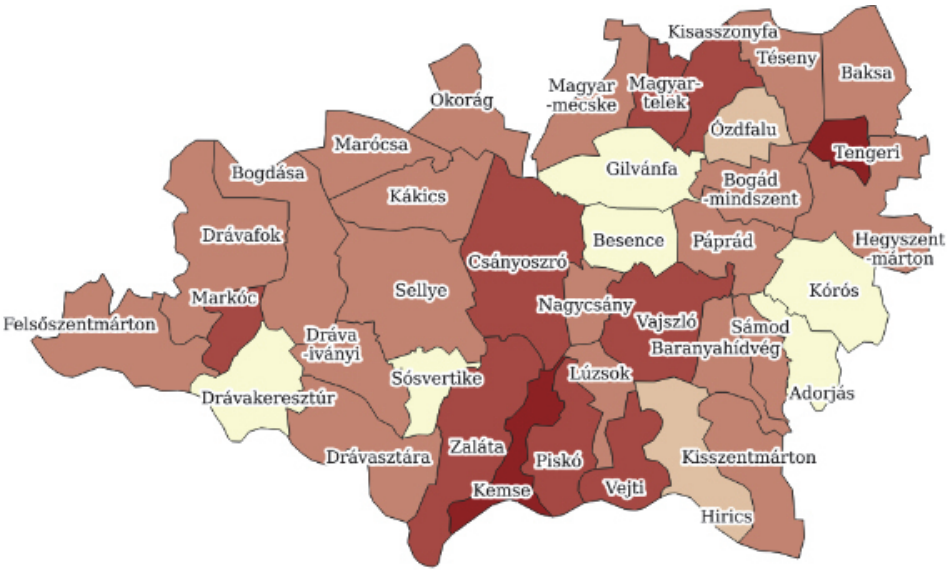
2 – Average net income per capita, average number of taxpayers per thousand inhabitants, average number of cars per thousand inhabitants (19)

3 – High net income per capita, high number of taxpayers per thousand inhabitants, high number of cars per thousand inhabitants (19)

Note: Authors' analysis based on TeIR and HCSO data.

Figure 2

The state of the business environment in the district of Sellye, 2017



1 – Low number of enterprises per thousand inhabitants, number of joint ventures per thousand inhabitants, low number of closed down enterprises per thousand inhabitants, low number of licensed traditional small-scale producers per thousand inhabitants (6)

2 – Below average number of enterprises per thousand inhabitants, below average number of joint ventures per thousand inhabitants, high number of closed down enterprises per thousand inhabitants, below average number of licensed traditional small-scale producers per thousand inhabitants (2)

3 – Average number of enterprises per thousand inhabitants, average number of joint ventures per thousand inhabitants, average number of closed down enterprises per thousand inhabitants, average number of licensed traditional small-scale producers per thousand inhabitants (20)

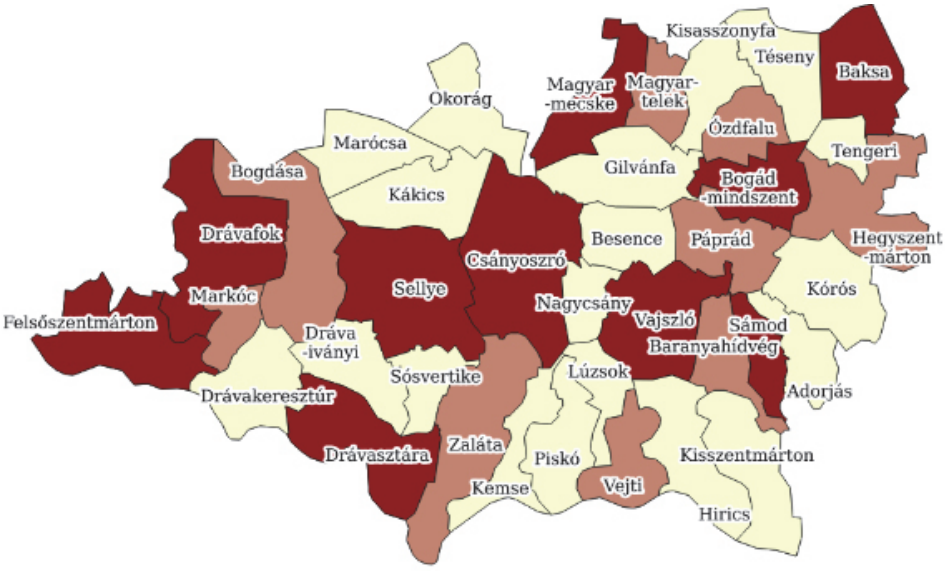
4 – Above average number of enterprises per thousand inhabitants, below average number of joint ventures per thousand inhabitants, average number of closed down enterprises per thousand inhabitants, above average number of licensed traditional small-scale producers per thousand inhabitants (8)

4 – High number of enterprises per thousand inhabitants, high number of joint ventures per thousand inhabitants, high number of closed down enterprises per thousand inhabitants, high number of licensed traditional small-scale producers per thousand inhabitants (2)

Note: Authors' analysis based on TeIR and HCSO data.

Figure 3

The state of infrastructural capital in the district of Sellye, 2017



1 – Low number of Internet subscribers per thousand inhabitants, low number of human public service provider locations per thousand inhabitants (19)

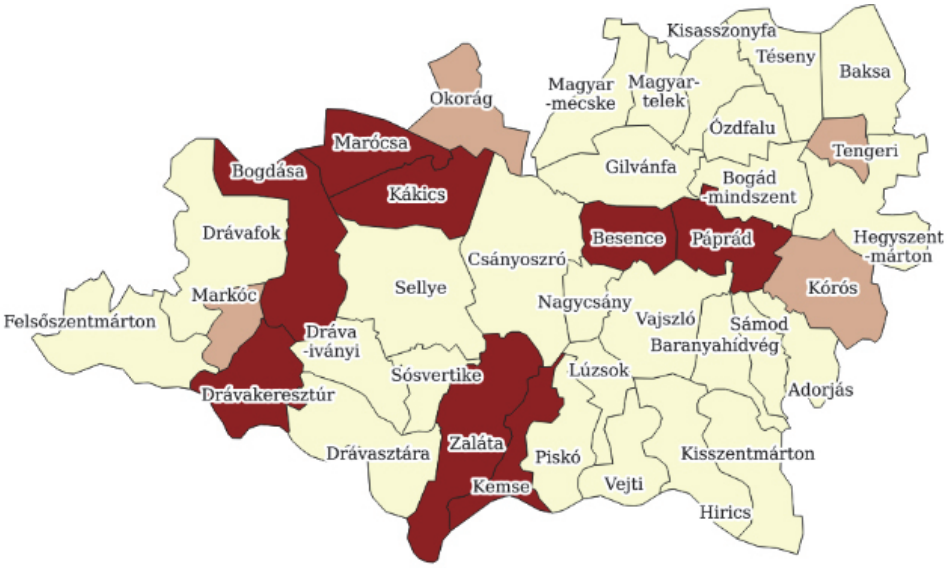
2 – Average number of Internet subscribers per thousand inhabitants, average number of human public service provider locations per thousand inhabitants (9)

3 – High number of Internet subscribers per thousand inhabitants, high number of human public service provider locations per thousand inhabitants (10)

Note: Authors' analysis based on HCSO data.

Figure 4

The state of natural capital in the district of Sellye, 2017



1 – Low amount of forested area per thousand inhabitants, low amount of arable land per low thousand inhabitants (26)

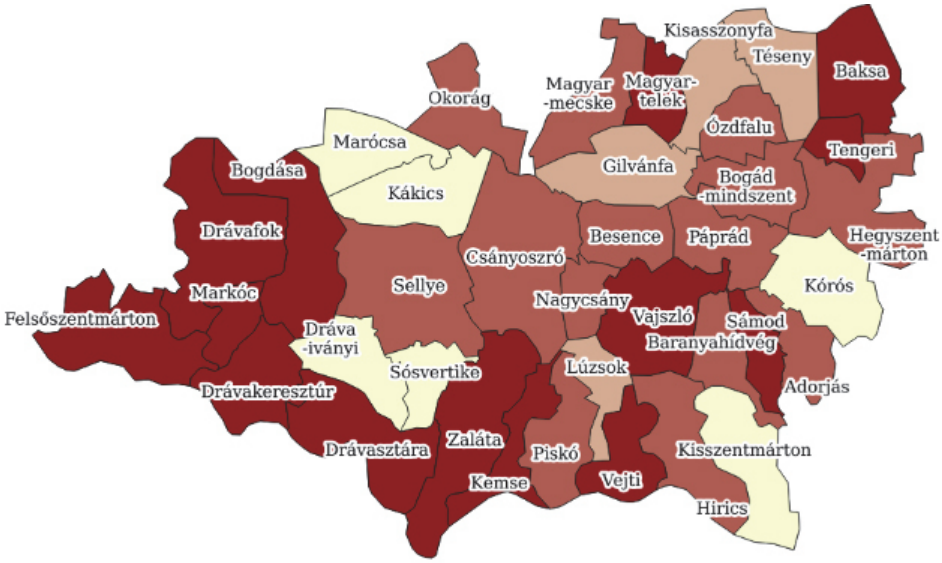
2 – Average amount of forested area per thousand inhabitants, average amount of arable land per low thousand inhabitants (4)

3 – High amount of forested area per thousand inhabitants, high amount of arable land per low thousand inhabitants (8)

Note: Authors' analysis based on the data of the Land Office Portal TakarNet.

Figure 5

The state of social capital in the district of Sellye, 2017



1 – Average number of jobseekers per thousand inhabitants, high number of emigrants per thousand inhabitants, low number of non-profit organizations per thousand inhabitants, above average number of offenders per thousand inhabitants (6)

2 – High number of jobseekers per thousand inhabitants, medium number of emigrants per thousand inhabitants, low number of non-profit organizations per thousand inhabitants, high number of offenders per thousand inhabitants (4)

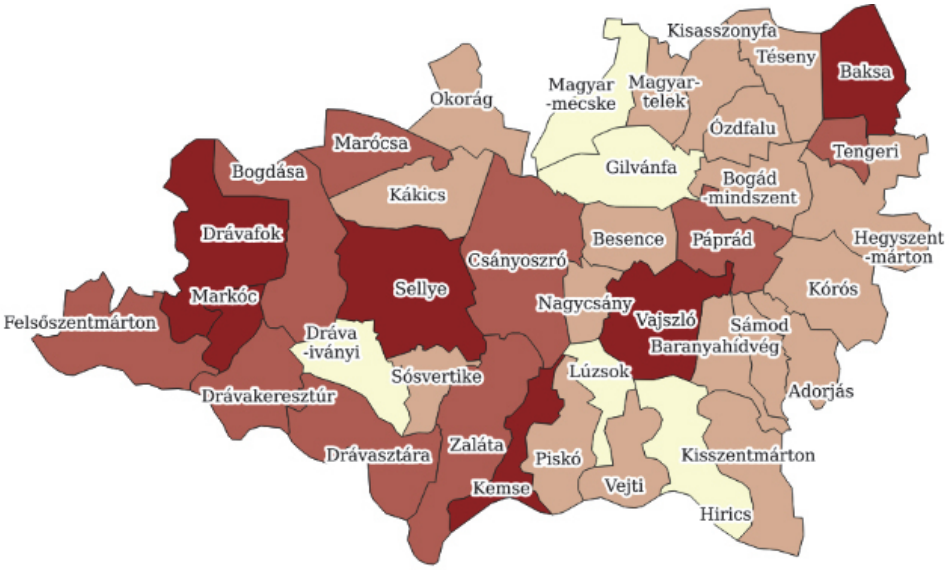
3 – Average number of jobseekers per thousand inhabitants, below average number of emigrants per thousand inhabitants, below average number of non-profit organizations per thousand inhabitants, low number of offenders per thousand inhabitants (14)

4 – Below average number of jobseekers per thousand inhabitants, average number of emigrants per thousand inhabitants, high number of non-profit organizations per thousand inhabitants, low number of offenders per thousand inhabitants (6)

Note: Authors' analysis based on data from the NES, the Ministry of the Interior BSR, and the HCSO.

Figure 6

The state of human capital in the district of Sellye, 2017



1 – Low number of people with a degree in higher education per thousand inhabitants, high number of young people per thousand inhabitants (5)

2 – Below average number of people with a degree in higher education per thousand inhabitants, above average number of young people per thousand inhabitants (18)

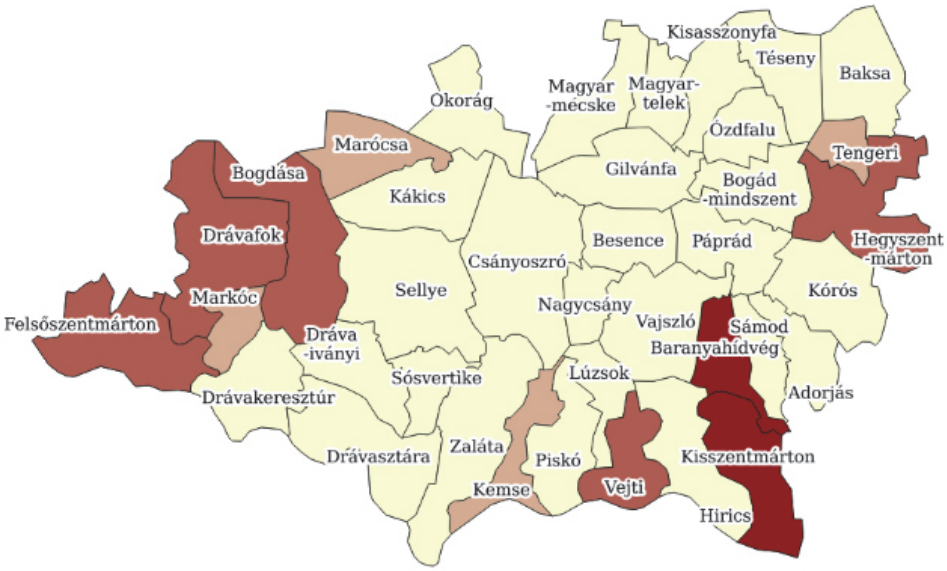
3 – Below average number of people with a degree in higher education per thousand inhabitants, low number of young people per thousand inhabitants (9)

4 – High average number of people with a degree in higher education per thousand inhabitants, below average number of young people per thousand inhabitants (6)

Note: Authors' analysis based on HCSO data.

Figure 7

The state of cultural capital in the district of Sellye, 2017



1 – Below average number of public cultural institutions, low number of cultural events, low cultural participation (27)

2 – High number of public cultural institutions, high number of cultural events, low cultural participation (4)

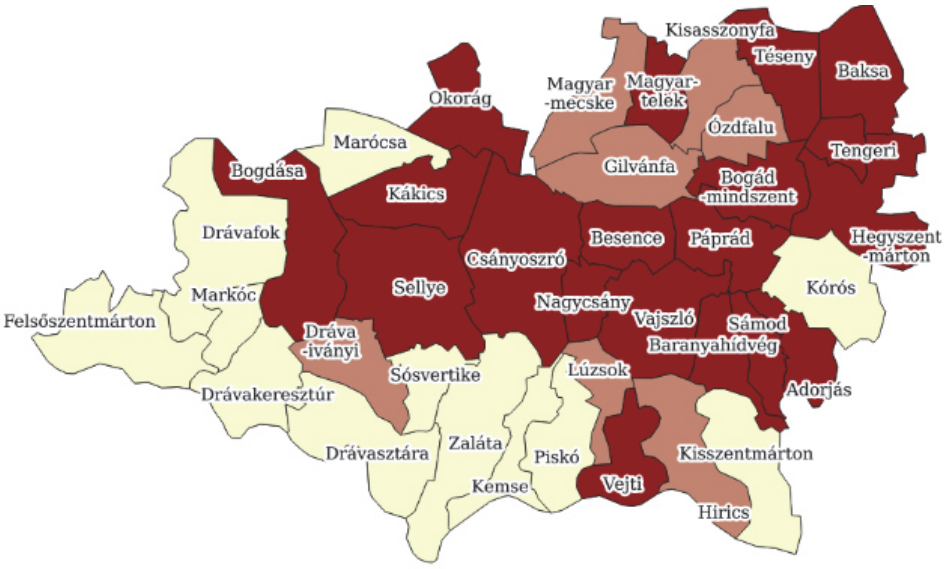
3 – Average number of public cultural institutions, high number of cultural events, high cultural participation (5)

4 – High number of public cultural institutions, outstandingly high number of cultural events, outstandingly high cultural participation (2)

Note: Authors' analysis based on HCSO data.

Figure 8

The state of relational capital in the district of Sellye, 2017



1 – Unfavourable transportation, low number of bus lines per thousand inhabitants, average number of commuters per thousand inhabitants, low number of cars per thousand inhabitants (12)

2 – Better than average transportation, low number of bus lines per thousand inhabitants, low number of commuters per thousand inhabitants, above average number of cars per thousand inhabitants (7)

3 – Goode transportation, high number of bus lines per thousand inhabitants, high number of commuters per thousand inhabitants, high number of cars per thousand inhabitants (19)

Note: Authors' analysis based on HCSO, OpenStreetMap, and Volánbusz data.

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