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Multidimensional analysis of territorial and social inequalities in Jász-Nagykun-Szolnok County with particular focus on the settlements of Kunhegyes District

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Declaration

I, the undersigned Katalin Kárász, author of the work entitled *Multidimensional analysis of territorial and social inequalities in Jász-Nagykun-Szolnok County with particular focus on the settlements of Kunhegyes District*, declare that in preparing the work I acted in accordance with the Code of Ethics for Research in effect at the Hungarian Academy of Sciences (MTA), in awareness and in possession of the research norms and permissions required in my field of study. Wherever ideas and results other than my own appear in the dissertation, I have clearly and identifiably indicated it.

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1. BACKGROUND, OBJECTIVES

Territorial inequality is among the most pressing and intractable challenges facing Hungarian society. The economic transformation that followed the change of regime of 1989 produced a sharply uneven spatial structure, in which the inner peripheries – among them the Great Plain and Northern Hungary – were locked onto a path of long-term decline. By the 2000s this pattern had largely set: the gap between core and periphery hardened, while successive development-policy interventions – EU co-financed programmes, schemes targeting the most disadvantaged (LHH) areas, and social inclusion strategies – delivered little or no real convergence. These inequalities are not merely economic. They are bound up with social exclusion, segregation and entrenched, intergenerational poverty, which weigh most heavily on disadvantaged communities, a large share of them Roma.

This dissertation examines territorial inequality at the settlement level in Jász-Nagykun-Szolnok County, focusing on the socio-economic situation of its most disadvantaged area, the Kunhegyes District (Figure 1).

The county reproduces the national pattern of inequality in miniature: the Szolnok–Jászberény axis is relatively prosperous, while the eastern and northern peripheries lag badly. Under Government Decree 290/2014 (XI. 26.), the Kunhegyes District is designated a beneficiary district eligible for complex development; in some of its settlements the disadvantages are among the most severe in the country, and the population is largely Roma, in some places almost entirely. Here, thus, the questions of territorial inequality and of Roma inclusion converge and are tightly interwoven.

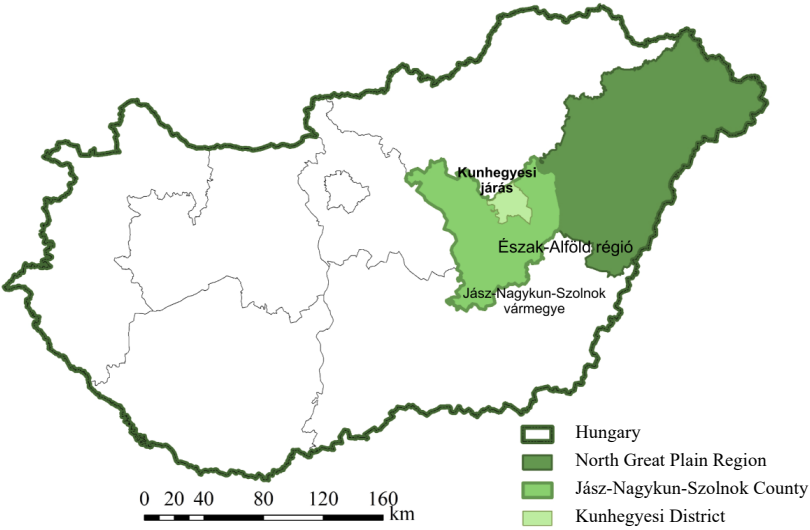


Figure 1. The location of Kunhegyes District and Jász-Nagykun-Szolnok County in the North Great Plain Region

Source: Kárász–Lipcsei (2021)

The choice of topic also reflects the author's personal commitment. Territorial inequality and social inclusion have been the central concern of her career for nearly two decades: as a programme manager for international organisations and as a consultant, she has worked on numerous research projects and development programmes addressing economic empowerment for social inclusion, the strengthening of Roma civic and political participation, and the development of disadvantaged areas. Two of her earlier projects feed directly into the present study and corroborate its findings on an independent sample: the county's Service Access Map (Diversitas–JNSZMTFÜ, 2020) and an assessment of the *Emerging Settlements* (FeTe) programme and of Roma access to public services (Daróczi–Kárász, 2025).

The study is framed by a structural perspective. In the author's view, the spatial segregation of Roma communities is not an ethnic but a structural problem, one that can only be understood

through a historical lens and a multidimensional approach. At the heart of this framework lies the concept of the *spatial trap*, drawing on Myrdal's (1957) theory of *cumulative causation* and the *regional development trap* described by Diemer and colleagues (2022): out-migration, the loss of human capital, declining economic appeal, the absence of investment, weak institutional capacity and the erosion of public services combine into a self-reinforcing downward spiral. Two phenomena operating at different levels can be separated analytically within this trap. *Learned helplessness* is an individual-level survival strategy formed in response to circumstances; *institutionalised, conditioned passivity* – the term used here for its system-level counterpart – is the mechanism that produces and sustains that passivity.

The notion of disadvantage is, however, frequently misinterpreted. In the most disadvantaged settlements, the proportion of Roma residents is typically high, and public discourse, often policy interpretation with it, tends to assume that the disadvantage of these communities stems primarily from their ethnocultural characteristics. This approach is not only scientifically questionable; it also steers development policy in the wrong direction, because it obscures the structural and historical mechanisms that in fact produced the present situation. Development interventions may likewise carry unintended effects. One important lesson of the fieldwork conducted for this research on the *Emerging Settlements Programme* (Felzárkózó Települések, FETE) is that delivering services to segregated areas in situ eases residents' immediate hardship, yet at the same time it reduces the pressure to move and builds a parallel institutional system – which over the longer term may, paradoxically, help to entrench segregation. It follows from these observations that one aim of the research is precisely to substantiate the structural interpretation empirically.

The statistical analysis of this structural relationship is further burdened by a substantial measurement problem. Data on the proportion of Roma residents rest on census self-declaration, which according to the literature captures only a half to a third of the actual Roma population (Kemény–Janky, 2006; Pénzes et al., 2018). This bias may systematically weaken the observed associations and handling it deliberately and reflecting on it therefore constitutes a methodological task.

Hungarian practice does offer composite, multidimensional approaches to measuring the development level of settlements, among them the composite indicator of Government Decree 105/2015. These, however, typically produce binary, nationally defined eligibility categories, and do not permit a finer, graduated analysis of settlements relative to one another within a given region. What is missing above all is an instrument that draws on the results of factor and cluster analysis to produce a development ranking directly interpretable by policymakers and local decision-makers. Filling this gap is one of the aims of the present research.

The analysis covers the decade between 2013 and 2023 and draws on secondary data for the seventy-eight settlements of the county, in-depth interviews with local leaders and experts, and a survey of local residents.

The overarching aim of the research is to map the territorial inequalities of the county and to analyse the socio-economic situation of the Kunhegyes District in depth, and in doing so to lay the foundations of a methodological framework that offers a tool of direct practical use to territorial development. Its specific objectives are:

- To identify the underlying factors that drive territorial differences among the county's 78 settlements through factor analysis, and to derive characteristic settlement groups through cluster analysis.

- To establish the methodological basis of a quintile-based composite development ranking that weighs the economic and social dimensions alike while also captures how differences change over time.
- To assess and visualise the development position of the settlements of Kunhegyes District across these methods, with particular attention to disparities within the district.
- To investigate the links between the spatial concentration of the Roma population and the socio-economic situation of settlements, and to substantiate structural explanations on scientific grounds.
- To demonstrate the value of combining quantitative and qualitative methods, especially in surfacing dynamics that the statistics do not reveal.
- To formulate development policy recommendations based on the empirical findings.

Research questions

- What are the underlying factors that shape settlement-level territorial differences across the county, and what characteristic settlement groups emerge from them?
- Can a composite development ranking be constructed that captures the economic and social differences between settlements more directly than factor or cluster analysis, and that also tracks change over time?
- Is the development position of the settlements in Kunhegyes District uniform across the various methods, and hence can they be treated as a single category?
- Is there a significant correlation between the proportion of Roma residents and socio-economic indicators across the county's settlements?

- If such a relationship exists, is it better explained by ethnocultural characteristics or by historical and structural mechanisms?
- Compared with data-driven analysis, what phenomena and mechanisms affecting the development of settlements do qualitative methods (in-depth interviews, surveys) reveal that cannot be read from statistical data, how do these refine the interpretation of the quantitative results, and how might they inform development policy interventions?

Hypotheses

1. **H1: Among the factors determining settlement-level territorial differences in Jász-Nagykun-Szolnok County, indicators of social circumstances form a distinct factor of their own, and settlements with severe social disadvantage form a separate, clearly distinguishable group.**

   This assumption rests on the fact that the literature on territorial inequalities – among others the work of Pénzes (2014) and Koós (2015) – consistently points to the spatial separation of social disadvantage and economic development. Across the settlements of Jász-Nagykun-Szolnok County the social indicators (the proportion of disadvantaged children, unemployment, the proportion of residents with low educational attainment, and others) are extremely dispersed: certain settlements, particularly the peripheral settlements of the Kunhegyes and Tiszafüred districts, record the least favourable values on every social dimension, while the county seat and the district centres are in a markedly better position. This pronounced dispersion suggests that social disadvantages appear in concentrated, mutually reinforcing form, and that they structure the differences between settlements as a dimension in their own right.

2. **H2: An appropriately constructed composite development ranking can give a more detailed picture of the development position of settlements, and one more directly applicable to policy decision-making, than factor or cluster analysis alone.**

   This assumption rests on the fact that factor analysis reveals latent dimensions but assigns no unambiguous development position to individual settlements, while cluster analysis creates types but establishes no hierarchy. For territorial development practice, however, it is essential that the development level of settlements be clearly comparable and that changes over time be traceable. The official eligibility classification (Government Decree 105/2015) does not allow fine distinctions between settlements to be identified, whereas a graduated ranking can serve these needs better.

3. **H3: The settlements of the Kunhegyes District do not form a homogeneous group in terms of development, and marked differences can be demonstrated between them.**

   This assumption rests on the fact that although Government Decree 290/2014 (XI. 26.) identifies the Kunhegyes District as a whole as a beneficiary district to be developed under a complex programme, substantial internal differences run between its constituent settlements. Kunhegyes, as the district seat, performs central administrative, educational and healthcare functions, and is in a more favourable position in terms of population size, institutional provision and economic activity alike. The peripheral settlements of the district, by contrast – Tiszabura and Tiszabő in particular – have the least favourable socio-economic indicators even in national comparison. This internal differentiation suggests that uniform development of the district cannot be effective, and that interventions must be adapted to the differing endowments and needs of individual settlements.

4. **H4: In the settlements of Jász-Nagykun-Szolnok County there is a significant association between the proportion of Roma residents and unfavourable socio-economic indicators.**

   This assumption rests on the fact that both the Hungarian literature (Kemény et al., 2004; Kertesi and Kézdi, 2011; Virág, 2010; Ladányi and Szelényi, 2004) and the international literature (Massey and Denton, 1993; Ringold et al., 2005; Brüggemann, 2012; FRA, 2016) document the connections between the spatial concentration of the Roma population – and of marginalised minority populations more broadly – and settlement-level socio-economic disadvantage. Those settlements of Jász-Nagykun-Szolnok County where the proportion of Roma residents is highest are at the same time those with the least favourable indicators of unemployment, educational attainment, the proportion of disadvantaged children and the proportion of taxpayers.

5. **H5: The demonstrable association between the proportion of Roma residents and settlement-level disadvantage cannot be explained by ethnocultural causes alone, but is better explained when historical processes and structural mechanisms are taken into account.**

   The premise here is that the present spatial concentration of the Roma population is the outcome of historically reconstructible processes transmitted across generations. The mutually reinforcing mechanisms of housing market segregation, educational exclusion and labour market discrimination sustain the situation that has developed. Both the Hungarian and the international literature (Ladányi and Szelényi, 2004; Szalai, 2007; Virág, 2010; Vincze and Raț, 2013) support the structural explanation. The purpose of the hypothesis is therefore not to prove the direction of causality statistically, but to examine whether, at the local level, the structural or the

ethnocultural explanation is consistent with evidence drawn from different sources.

6. **H6: Qualitative methods, complementing the quantitative analyses, can reveal local mechanisms and dynamics that are not visible in statistical data and that allow a more nuanced interpretation of the numerical patterns.**

   This assumption rests on the fact that quantitative indicators – the unemployment rate, income data, demographic measures and the like – offer a snapshot of the situation of settlements but do not reveal the processes and phenomena unfolding at community level. Experience gained during preliminary fieldwork indicates that the development of the settlements studied is also fundamentally shaped by factors that do not appear in official statistics: the spread of drug dependency and its effect on family structures, the erosion of community cohesion, the informal coping strategies triggered by development projects, the tension between place attachment and the intention to move, and the paradoxical relationship between access to public services and social mobility. Without knowledge of these soft factors, the effectiveness of development policy interventions remains limited.

2. MATERIAL AND METHOD

The research rests on a mixed-methods design. The secondary research comprises four interlocking quantitative analyses – factor analysis, cluster analysis, the quintile-based composite development ranking, and correlation analysis – while the primary pillar consists of structured in-depth interviews and a resident survey. The secondary analyses draw on a database covering all 78 settlements of Jász-Nagykun-Szolnok County for two points in time (2013 and 2023), compiled from the territorial statistics of the Hungarian Central Statistical Office (KSH) (TeIR, T-STAR, STADAT), the 2011 and 2022 censuses, and labour and sectoral databases. In preparing the data, the author normalised the raw figures and converted them into population-weighted relative indicators; missing or inconsistent data were handled in a documented manner, and indicators unavailable at settlement level or for either of the two periods were excluded.

2.1. Factor analysis

To uncover the latent dimensions of territorial inequality, the author carried out a principal component analysis with Varimax rotation, reducing an initial set of 68 indicators to a final 35 through an iterative, SPSS-supported variable selection.

The selection followed statistical and methodological criteria. The author removed (1) redundant elements among the over-represented social indicators, which were distorting the factor structure; (2) strongly multicollinear variables (for example, the housing-quality indicators correlated pairwise between 0.85 and 0.95); (3) variables with low communality, below 0.3–0.4; (4) indicators whose method of collection changed during the study period (statistics affected by the 2016 child-protection reform and by the new Criminal Code in force from 2013); and (5) indicators available for only one of the two years. The final set remained thematically balanced, covering labour-market, income,

entrepreneurial, infrastructural, housing, demographic, social and public-safety indicators.

Sampling adequacy was confirmed by the Kaiser–Meyer–Olkin measure (2013: 0.827; 2023: 0.846) and Bartlett's test ($p < 0.001$). The number of factors was set by combining the Kaiser criterion, the scree test and a comparison of the rotated component matrices of the seven-, six- and five-factor solutions: the seven-factor solution proved over-extracted, the five-factor solution collapsed several distinct dimensions into one heterogeneous factor, and the six-factor solution yielded the most coherent and interpretable structure (Figure 2).

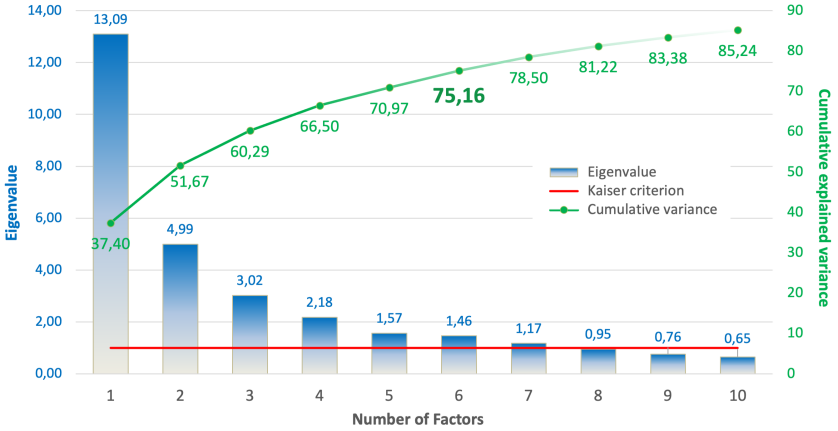


Figure 2: Factor Eigenvalues and cumulative explained variance, 2023

Source: Author's Own calculation and compilation (2026)

2.2. Cluster analysis

The six latent dimensions yielded by the factor analysis allow a synthetic comparison of the settlements; the factor scores, which express each settlement's standardised position on a given dimension, provide a sound basis for typology. The aim of the cluster analysis was to group the 78 settlements so as to maximise within-group homogeneity and between-group heterogeneity.

The analysis was carried out in SPSS Statistics using a hierarchical procedure, whose advantage is that it does not require the number of clusters to be fixed in advance: the agglomerative process gradually merges settlements, allowing the optimal number of clusters to be determined empirically afterwards. Ward's method produced relatively even, compact clusters that are less sensitive to outliers. The optimal number of clusters was established by examining the agglomeration schedule and the dendrogram together, and by comparing several solutions (four, five and six clusters) on both substantive and statistical grounds.

The robustness of the hierarchical solution was checked with a K-means procedure. The two methods rest on different logic: the hierarchical approach builds the cluster structure step by step, whereas K-means is an iterative partitioning algorithm that assigns cases to a predetermined number of clusters. Using them together strengthens the reliability of the results (Everitt et al., 2011). The K-means analysis was likewise run with five clusters, and the ANOVA results showed that all six factors differ significantly between clusters ($p < 0.01$). The two methods agreed in part and diverged in part: the divergences arose mainly at the cluster boundaries, while both consistently identified the extreme outlier status of Tiszabő and Tiszabura, the relative cohesion of the Jászság settlements, and the distinctive profile of the peripheral Nagykunság (Greater Cumania) area.

2.3. The quintile-based settlement-level composite development ranking

The official normative classification, the composite indicator of Government Decree 105/2015 (IV. 23.), uses a binary logic to establish eligibility for development support, but it cannot capture relative differences within a county in a nuanced way. This limitation prompted the development of the quintile-based composite development ranking as a methodological experiment. Building on the factor and cluster results, it arranges the

settlements on a five-grade scale; rather than replacing the earlier methods, it complements them, and its validity is confirmed where its results align with the findings of both analyses.

The framework draws on established Hungarian settlement-ranking approaches (Kovács–Káposzta, 2015; Szűcs–Káposzta, 2018; Áldorfai et al., 2022; Koós, 2015) but departs from them in three respects. First, it organises the indicators into an economic-infrastructural and a social group, averaging within sub-groups and summing across them, so that each indicator group contributes equally to the final result. Second, it uses value-range-based quintiles, which do not impose an even distribution but reflect the actual spread of the data. Third, it can be applied to several points in time, making it possible to document each settlement's trajectory – relative improvement, stagnation or decline.

Unlike conventional percentile-based quintiles, which form five groups of equal size, the value-range approach divides the gap between an indicator's minimum and maximum into five equal intervals – an approach particularly suited to non-normally distributed indicators and to data containing extreme values.

A Q_i quintile value for a particular x_i indicator is calculated based on the following formula:

$$\boldsymbol{Q_i = \min\left(5; \left\lfloor 5 \cdot \frac{x_i - x_{\min}}{x_{\max} - x_{\min}} \right\rfloor + 1\right)}$$

where

- Q_i = the quintile value of the i^{th} settlement (on a 1–5 scale)
- x_i = the indicator value of the i^{th} settlement
- x_{min} = the minimum value of the indicator in the whole sample
- x_{max} = the maximum value of the indicator in the whole sample
- $\lfloor\ \rfloor$ = floor function

The min() and max() functions keep the quintile values within the 1–5 range. The computation was carried out in Microsoft Excel.

The ranking is built in five steps (Figure 3).



Figure 3: Process of constructing the composite development ranking

Source: Own compilation (2026)

In the first step, the raw data were normalised and converted into population-weighted relative indicators, with documented treatment of the data challenges (the use of census figures, the under-reporting of the Roma proportion arising from self-declaration, missing and inconsistent data, and methodological changes). In the second step, each indicator was assigned a value-range quintile, with attention to its direction: for negatively oriented indicators the quintiles were reversed. In the third step, the 19 economic-infrastructural indicators were grouped into five sub-groups (employment; income–enterprises; income–households; transport; infrastructure) and the 45 social indicators into eight (demography; employment; housing; poverty and deprivation; education; child protection; healthcare; crime); separating the sub-indices also shows whether a given disadvantage is primarily economic or social. The quintile values were averaged within sub-groups, and summing these averages produced an economic and a social sub-index, giving each sub-group equal weight. In the fourth step, the composite social-

inclusion index was formed as the sum of the two sub-indices; a higher value signals a more favourable position and a smaller inclusion need, and on this basis the settlements were ranked. In the fifth step, the settlements were sorted – again on a quintile basis – into five development categories (Table 1); these categories express the settlements' position relative to one another, not an absolute level of development.

Table 1: Categories of the quintile-based composite development ranking

Cat.	Name	Description
A	**Dynamically developing**	Most favourable composite indicators; economic and social performance significantly above average
B	**Moderately developing**	Above-average development; stable economic and social indicators
C	**Stagnating**	Average position; neither outstanding nor severely lagging indicators
D	**In need of development**	Below-average development; settlements requiring targeted intervention
F	**Lagging**	Least favourable situation; settlements requiring a complex inclusion programme

Source: Own compilation (2026)

The method has several advantages. (1) It preserves the natural distribution of the indicators: where most settlements cluster around similar values and a few stand at the extremes, that pattern is carried through into the quintile distribution (on the share of the 0–14 age group, for instance, 94.8% of settlements fall into the first two quintiles). (2) It handles outliers well, placing extreme cases clearly in the end quintiles without distorting the assessment of the majority (Tiszabő's 37.54% share of children, for example, is unique in the county). (3) The uniform 1–5 scale also makes indicators measured in very different units directly comparable and allows composite indices to be built, while (4) an uneven

quintile distribution is itself a diagnostic signal of how concentrated a given disadvantage is.

The method also has limits. (1) The quintile boundaries are sensitive to the extremes of the range, so the classification of settlements near a boundary is less certain. (2) Some quintiles occasionally contain a single settlement, which constrains statistical analysis but faithfully reflects real polarisation. (3) The method is outlier-sensitive – a single extreme value (such as Mezőhék's 2013 registered-capital figure) can shift the classification of all the others – though this effect is greatly dampened at the composite level by the double averaging (within sub-groups, then across categories). (4) Finally, the ranking is relative and ordinal: a change in classification may stem either from a change in a settlement's own value (genuine change) or from movement among the others (contextual change), so temporal comparisons were always cross-checked against the absolute indicator values. The ranking's objectivity is reinforced by the fact that the study covers all 78 settlements of the county in full, rather than relying on a sample.

The reliability of the method was verified by sensitivity analysis. The ranking remained stable both when the weighting was varied (equal weighting across dimensions, and z-score standardised weighting) and when the indicator groups were omitted one by one (jackknife procedure): Spearman's rank correlation was at least 0.975 under every perturbation, confirming that the settlement hierarchy obtained is not an arbitrary consequence of weighting or indicator selection decisions, but a robust representation of development conditions.

2.4. Correlation analysis

The fourth pillar of the secondary research is a correlation analysis of the relationship between the proportion of Roma residents and the socio-economic indicators of settlements. This required particular care: the subject is politically and socially

sensitive, and Hungarian scholarship – partly out of an understandable caution to avoid stigmatisation – rarely quantifies such relationships, which in turn hampers a deeper understanding of the structural problems. The research proceeds from the conviction that, far from reinforcing stereotypes, scholarly inquiry helps to dismantle them by making clear that a higher Roma proportion is not the cause, but the consequence and indicator of structural disadvantages rooted in centuries of exclusion.

The settlement-level Roma proportion was measured using the nationality self-declaration data of the 2011 and 2022 censuses. These figures are known to under-state the true proportions: for fear of stigmatisation many do not declare themselves Roma, and the rate of declaration varies both across settlements and over time (Kemény et al., 2004; Pénzes et al., 2018). The fieldwork bore this out: in Tiszabura the local estimate is 85–90%, and Tiszabő, according to the interviews and the resident survey, is almost entirely Roma – figures well above the official record. Even so, the census remains the most widely available, methodologically standardised source and, although it under-states in absolute terms, it proved suitable for detecting relative differences and correlation patterns between settlements; the results were accordingly read as lower-bound estimates.

Both Pearson and Spearman rank correlation coefficients were calculated between the share of the Roma population and six deliberately selected indicators, each capturing a different dimension of structural disadvantage: labour market integration (the employment rate and the proportion of participants in public employment), income-generating capacity and embeddedness in the formal economy (the proportion of personal income tax payers), the intergenerational transmission of social deprivation (the proportion of disadvantaged children), the characteristics of the demographic structure (the proportion of the population aged 0–14; Obádovics, 2018), and aggregate settlement-level

development (the composite development index). Using the two coefficients together also demonstrates the robustness of the associations identified: the Pearson coefficient measures linear association, while Spearman's rank correlation measures monotonic association and is more resistant to outliers and to non-linear relationships. In interpreting the coefficients, the conventional thresholds were applied: below 0.3 the correlation is weak, between 0.3 and 0.7 moderate, and above 0.7 strong.

2.5. In-depth interviews

To gain a deeper understanding of the Kunhegyes District, semi-structured in-depth interviews were conducted, serving both to answer the research questions on internal heterogeneity within the district, structural mechanisms and the added value of qualitative work, and to test the hypotheses. The interviewing was deliberately multi-level. In the first round I interviewed the mayor or deputy mayor of each of the district's seven settlements (during 2023–2025). The second round covered front-line and system-level experts (during 2024–2025): a special needs educator, a deputy head teacher, the head of a Jelenlét ('Presence') Point, a FETE programme manager, social workers, the district and monitoring managers of the Hungarian Charity Service of the Order of Malta, members of the FETE Thematic Committee, staff of the family support service, and the manager of a community workshop (manufaktúra). At the third level, semi-structured interviews were conducted with Roma families in Tiszabura and Tiszabő (in July 2024). The expert group was selected through purposive, position-based sampling covering every level of the intervention chain, while families were reached by snowball sampling, following the principle of maximum variation, given the characteristics of a hidden population. At all three levels the number of interviews was bounded by theoretical saturation, and the families were guaranteed full anonymity.

The three interview guides approached social inclusion from different vantage points. The local-leader interviews covered six themes: the settlement's situation and trajectory; the position of the Roma community and the structural roots of segregation; the effectiveness of development funding and interventions; hidden dynamics absent from the statistics; cooperation, actors and responsibilities; and development-policy proposals. The expert interviews likewise comprised six blocks focused on the professional assessment of the area (structural mechanisms; the social care system and education; the evaluation of the FeTe and Presence programmes; and system-level policy questions). The family interviews organised into six blocks (family history and demographic background; livelihood and employment; the severity of social problems; community spirit and public safety; access to public services; and the assessment of the Maltese Charity Service's programmes), opened up the micro-social level of inclusion and the everyday survival strategies of households. The Roma families were recruited by snowball sampling through the local staff of the Maltese Charity Service; the sample included households living both inside and outside segregated areas, public-works and primary-labour-market workers, and elderly pensioners as well as young families with children.

The interviews lasted 60–120 minutes and were analysed within the framework of the research questions and hypotheses. Their interpretation also drew on the field experience the author had gained through earlier professional work in the area – a personal embeddedness that is at once a strength and a limitation of qualitative research; following the principle of reflexivity, she consciously managed her own assumptions and emotional involvement.

2.6. Resident questionnaire survey

Alongside the interviews, the author carried out a standardised resident survey in all seven settlements of the district, designed to

complement the macro-level indicators of territorial inequality with residents' own experiences. The questionnaire comprised 36 closed items in ten thematic blocks (basic data; housing and infrastructure; financial situation; transport and spatial mobility; perceptions of the settlement; the severity of social problems; community life; the assessment of public services; awareness and assessment of inclusion programmes; and prospects for inclusion), mostly using five-point scales or fixed categories, which allowed settlements to be compared systematically. The sample numbers 120 respondents; the two emerging settlements, Tiszabő and Tiszabura, are deliberately over-represented (41.7% together), as the dissertation's central questions called for a closer analysis of them.

The survey was administered with the help of local leaders and social professionals, usually through group completion and primarily among public-works employees. This is not a probability sample and carries documented biases: public-works employees (44.2%), women (64.2%) and those with little formal education (50.8% with at most eight grades of primary school, only 2.5% with a degree) are over-represented. Yet the sample captures precisely the groups most exposed to territorial inequality, so – read with due regard for the limits of representativeness, for the likely under-reporting on sensitive items (drug use, usury, domestic violence), and through triangulation with the quantitative analyses and the interviews – the results offer valuable insight into the internal dynamics of declining areas.

3. RESULTS

3.1. Results of the factor analysis

The factor analysis identified six mutually independent latent dimensions, which together explain 75.16% of the total variance. Table 2 presents a heat map of the factor loadings, showing the component matrix after Varimax rotation.

Table 2: Heat map of the factor loadings of the rotated component matrix

Indicator	F1	F2	F3	F4	F5	F6
Population of ppl aged +65 yrs	-0,91	-0,14	-0,07	-0,15	0,05	-0,12
Inactive ppl receiving benefits	-0,89	0,10	0,22	0,10	-0,13	-0,01
Population per 100 dwellings	0,84	-0,14	0,16	0,25	-0,12	-0,27
Natural increase / decrease in pop.	0,77	0,05	-0,02	0,01	-0,01	-0,01
Population aged 0–14 yrs	0,75	0,25	0,28	0,39	-0,10	0,07
Dependants	0,71	0,08	0,30	0,44	-0,19	-0,12
Induced abortions per 1,000 ppl	0,64	0,03	0,20	0,52	-0,21	0,21
Jobseekers with primary education	0,42	0,38	0,28	0,32	-0,16	0,26
Households w/o hot running water	-0,11	0,92	0,13	0,07	-0,17	0,17
Households w/o bathroom	-0,13	0,92	0,15	0,08	-0,15	0,20
Households w/o amenities	-0,13	0,91	0,15	0,07	-0,14	0,19
Households w/o gas consumption	-0,36	-0,73	-0,19	-0,24	0,25	-0,04
Dwellings connected to sewerage	-0,05	-0,69	-0,34	0,02	-0,02	0,15
Dwellings w/ tap water	-0,15	-0,66	-0,14	-0,11	-0,09	0,32
Employees in prestige occupation	-0,37	-0,57	-0,20	-0,03	0,48	-0,30
Dwellings built during the year	-0,16	-0,42	-0,03	0,03	0,28	-0,20
Road distance from Budapest	-0,29	-0,01	0,78	0,05	-0,21	-0,10
Registered jobseekers	0,19	0,24	0,78	0,26	-0,09	0,23
Jobseekers rel. to +15-year-olds	0,33	0,25	0,75	0,33	-0,10	0,16
Road distance from major junction	0,01	0,04	0,71	-0,14	0,35	0,11
Public workers per 100 ppl	0,25	0,37	0,71	0,07	-0,22	0,05
Per capita income	-0,17	-0,35	-0,63	-0,42	0,41	-0,20
Distance from county seat	-0,15	0,25	0,62	-0,11	0,38	0,09
Ppl rec. child protection allowance	0,38	0,25	0,62	0,36	-0,20	0,35
Employment rate	-0,23	-0,27	-0,59	-0,58	0,31	-0,08
Minors at risk	0,05	0,34	0,45	-0,13	-0,03	0,32
Roma population share	0,34	0,00	0,39	0,37	-0,06	0,23
Thefts per 1,000 residents	0,17	0,01	-0,05	0,84	0,07	0,10
Reg. crimes per 1,000 residents	0,13	0,09	0,04	0,84	0,17	0,15
Taxpayers per 100 residents	-0,23	-0,24	-0,46	-0,59	0,41	-0,11
Reg. capital of enterprises per res.	0,08	-0,13	-0,09	0,08	0,74	0,03
Enterprises per 1,000 residents	-0,35	-0,50	-0,15	-0,14	0,52	-0,18
Distance from district seat	0,10	0,24	-0,05	0,00	-0,49	0,23
Disadv. children in kindergarten	-0,01	0,13	0,29	0,19	-0,08	0,84
Disadv. children in primary school	-0,04	0,09	0,17	0,26	-0,12	0,84

Source: Own compilation (2026)

The first three – the demographic, housing and peripherality dimensions – carry almost equal weight and together account for roughly half of the variance, showing that the county's territorial inequalities are structured not by a single dominant force but by several interwoven dimensions.

1. **Factor F1 – Population dynamics** (16.71%) has at its positive pole the markers of a young age structure (residents per 100 dwellings: +0.843; natural increase: +0.770; share of the 0–14 age group: +0.747) and at its negative pole the signs of ageing (share of those over 65: −0.914; inactive benefit recipients: −0.895). The positive pole does not, however, signal demographic vitality alone: in the most disadvantaged settlements a young age structure coincides with markers of social strain.
2. **Factor F2 – Housing deprivation** (16.68%) captures the quality of the housing stock, loading most heavily on the share of households without hot running water (+0.920), without a bathroom (+0.918) and without basic amenities (+0.913), and at its opposite pole on the provision of utilities (household gas connections: −0.733; mains sewerage: −0.687).
3. **Factor F3 – Composite peripherality** (16.21%) is the most complex dimension of territorial inequality, drawing geographical accessibility (distance from Budapest: +0.784; distance from the nearest motorway junction: +0.710), labour-market exclusion (share of jobseekers: +0.778; public-works employees: +0.707; employment rate: −0.593; per-capita PIT income: −0.633) and social disadvantage (recipients of the regular child-protection benefit: +0.622; Roma proportion: +0.393) into a single dimension – empirical evidence that spatial, labour-market and social peripherality overlap and compound one another.

Mapped (in QGIS), based on TeIR and KSH T-STAR 2022–23 data, the factor traces the county's sharpest structural divide: between the well-connected west (the Jászság and the Szolnok area) and the eastern, Tisza-side Nagykunság periphery (Figure 4).

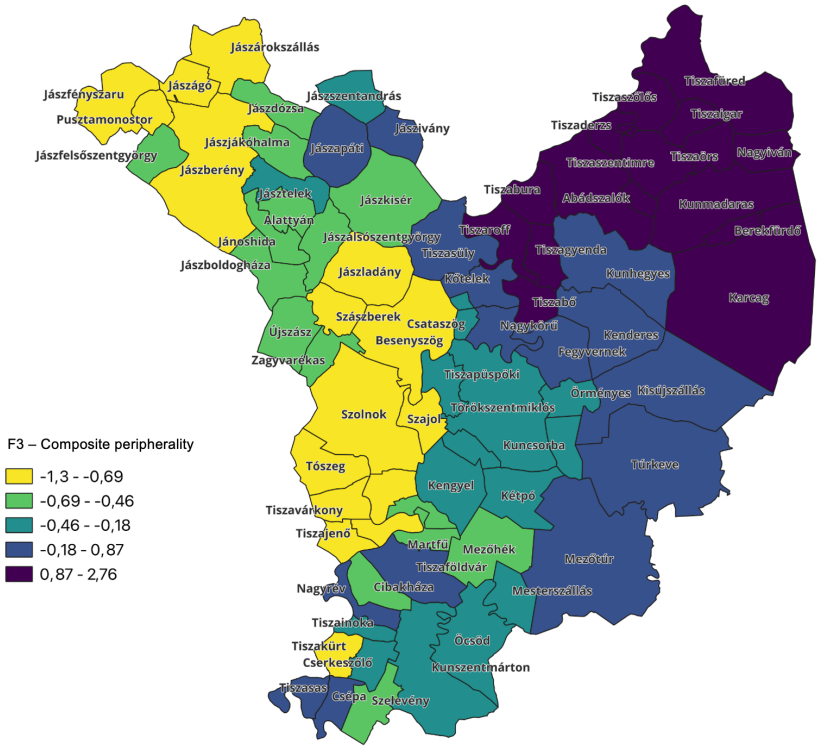


Figure 4: Map of factor F3 – Composite peripherality, 2023

Source: Own compilation (2026)

4. **Factor F4 – Public safety risk** (10.89%) condenses the crime indicators (thefts: +0.843; registered crimes: +0.835) and is best read through the theory of social disorganisation.
5. **Factor F5 – Entrepreneurial activity** (7.33%) measures the strength of the local economy (per-capita registered capital of enterprises: +0.738); the negative loading of distance from

the district seat (−0.490) reveals that settlements farther from the centres consistently show lower entrepreneurial activity.

6. **Factor F6 – Educational deprivation** (7.32%) represents childhood disadvantage: the very strong co-movement of the shares of disadvantaged kindergarten children and primary-school pupils (both +0.84) shows that disadvantage runs consistently from kindergarten through primary school.

The key lesson of the factor structure is that the social indicators did not coalesce into a single factor but appeared spread across several dimensions: territorial disadvantage is multidimensional and cannot be reduced to any one indicator.

3.2. Results of the cluster analysis

The cluster analysis based on the factor scores identified five sharply distinct settlement groups. The cluster centroids – the average factor values of the settlements in each group – concisely characterise the profile of each type.

The deviations from the centroids are illustrated by the heat map of Table 3:

Table 3: Cluster centroids (heat map)

Factor	1. Perif.	2. Dynam.	3. Stable	4. Ageing	5. Margin.
F1 – Demogr. vit.	-0,47	+0,83	+0,34	-0,51	+3,86
F2 – Housing depr.	-0,34	-0,24	-0,58	+0,67	+0,64
F3 – Peripherality	+1,39	-0,53	-0,66	-0,39	+2,22
F4 – Crime	-0,26	+0,80	-0,74	+0,29	+1,75
F5 – Entrepr. act.	+0,31	+0,74	-0,27	-0,21	-0,86
F6 – Edu. disadv.	+0,15	+1,40	-0,13	-0,35	-2,16
# of settlements (n)	**18**	**10**	**20**	**28**	**2**

Source: Own calculation and compilation (2026)

The cluster profiles are also confirmed visually by the chart below (Figure 5): the curve of cluster 5 pulls away from the others on every dimension, illustrating the statistical outlier status of the two marginalised settlements.

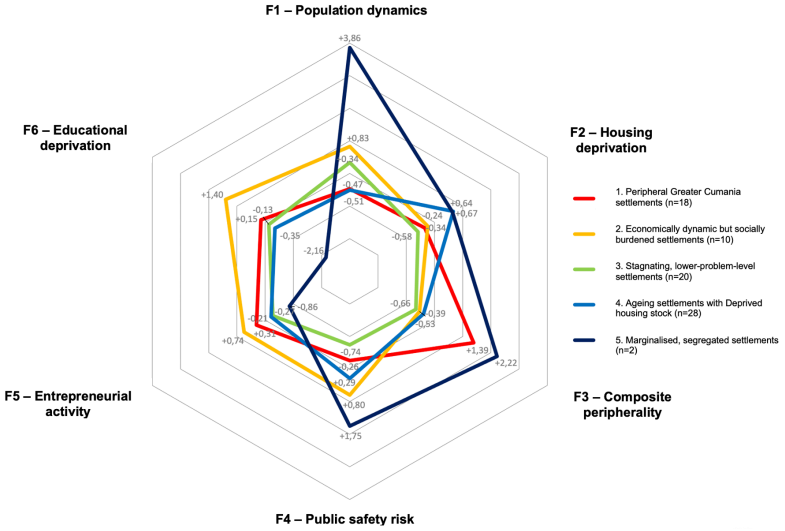


Figure 5: Factor profiles of the clusters (radar chart), 2023

Source: Own calculation and compilation (2026)

The names and sizes of the five clusters are given in Table 4. The author derived the cluster names from the characteristics of each group, assigning to every cluster the social and economic-infrastructural indicators whose average values deviated most distinctively from the sample as a whole; together these define the group's profile.

Table 4: Size distribution of the five-cluster solution (no., %)

Cl.	Name	n	Share (%)
1	Peripheral Nagykunság settlements	18	23,1
2	Economically dynamic, socially burdened	10	12,8
3	Stagnating with lower problem-levels	20	25,6
4	Ageing with deprived housing stock	28	35,9
5	Marginalised, segregated settlements	2	2,6
	Total	**78**	**100,0**

Source: Own calculation and compilation (2026)

Characterisation of the clusters:

1. **Peripheral Nagykunság and Tisza-side settlements:**
   Markedly high peripheral disadvantage (F3: +1.39) and unfavourable demography (−0.47), yet housing quality (−0.34) and crime (−0.26) better than the county average – a legacy of the historical heritage of the Nagykunság market towns.
2. **Economically dynamic but socially burdened settlements:**
   The strongest demographic vitality (+0.83) and high entrepreneurial activity (+0.74) coupled with the highest childhood educational disadvantage (+1.40) and above-average crime (+0.80); low peripheral disadvantage (−0.53).
3. **Stable, moderate social-problem-level settlements:**
   Low housing deprivation (−0.58) and peripheral disadvantage (−0.66), low crime (−0.74) and slightly positive demography (+0.34) – the county's most balanced areas.
4. **Ageing settlements with a deprived housing stock:**
   The largest group, defined by the combination of an ageing population (−0.51) and high housing deprivation (+0.67) – the twin trap of demographic and infrastructural decline.

5. **Marginalised, segregated settlements:**

   Extreme values on every dimension – the exceptional demographic vitality (+3.86) conceals a very young but multiply disadvantaged population, alongside outstanding peripheral disadvantage (+2.22) and crime risk (+1.75) and minimal entrepreneurial activity (−0.86).

The clusters form coherent spatial patterns (Figure 6): the fundamental fault line of the county's structure runs between the Szolnok–Jászberény economic axis and the peripheral area of eastern Nagykunság. The typology is therefore not a statistical artefact but reflects real territorial structures shaped by core–periphery relations, transport accessibility and historical development paths.

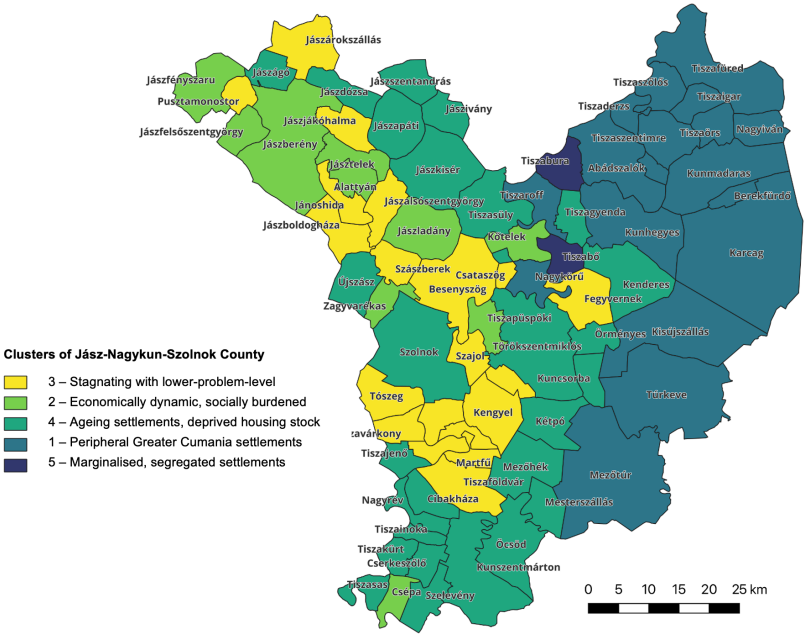


Figure 6: Map of the clusters of Jász-Nagykun-Szolnok County, 2023

Source: Own compilation (2026)

3.3. Results of the composite quintile development ranking

In the 2023 quintile-based composite development ranking (see Table 5), 13 settlements (16.7%) were classified as dynamically developing, 29 (37.2%) as moderately developing, 17 (21.8%) as stagnating, 14 (17.9%) as requiring development, and 5 (6.4%) as lagging behind.

Table 5: Quintile ranking of the settlements of Jász-Nagykun-Szolnok County – extract (2023)

	Settlement	Econ-infra. index	Social index	Composite index	Quintile rank (1-5)
1	Jászberény	20,50	33,30	53,80	1
2	Szolnok	19,35	33,63	52,98	1
3	Tószeg	18,10	33,89	51,99	1
14	Tiszafüred	15,85	33,08	48,93	2
15	Jászalsószentgyörgy	16,98	31,91	48,89	2
16	Berekfürdő	16,58	32,02	48,60	2
43	**Kunhegyes**	**14,63**	**29,72**	**44,35**	**3**
44	Zagyvarékas	14,80	29,41	44,21	3
45	Tiszatenyő	15,02	28,73	43,75	3
50	**Abádszalók**	**13,45**	**28,82**	**42,27**	**3**
54	**Tomajmonostora**	**12,75**	**29,00**	**41,75**	**3**
60	Tiszaszőlős	12,77	26,95	39,71	4
61	Kenderes	13,65	25,72	39,37	4
62	Szelevény	14,28	24,98	39,26	4
73	**Tiszaroff**	**12,48**	**23,88**	**36,36**	**4**
74	**Tiszagyenda**	**12,12**	**21,57**	**33,68**	**5**
75	Tiszaderzs	11,07	22,43	33,50	5
76	Kunmadaras	10,07	22,72	32,79	5
77	**Tiszabő**	**8,33**	**22,56**	**30,89**	**5**
78	**Tiszabura**	**8,60**	**22,06**	**30,66**	**5**

Source: Own calculation and compilation (2026)

Over the decade studied, the county's mean composite index rose from 41.83 to 43.82 (+4.8%), but the gain was lopsided: the social sub-index climbed appreciably (+6.6%) while the economic sub-index barely moved (+1.3%). Around two-thirds of settlements (67%) kept their quintile, yet polarisation deepened – the standard deviation of the composite index rose from 0.92 to 1.05, and the gap widened at both ends. Among the upwardly mobile settlements, Kunszentmárton ($2^{nd} \rightarrow 1^{st}$ quintile) and Tiszajenő ($3^{rd} \rightarrow 2^{nd}$, the county's largest rank gain) stand out; among those sliding down, Tiszafüred ($1^{st} \rightarrow 2^{nd}$), Mezőhék ($3^{rd} \rightarrow 4^{th}$) and Tiszagyenda, which fell into the lagging-behind category ($4^{th} \rightarrow 5^{th}$). The chart below (Figure 7) plots the 78 settlements in the space defined by the economic-infrastructural index (vertical axis) and the social-inclusion index (horizontal axis):

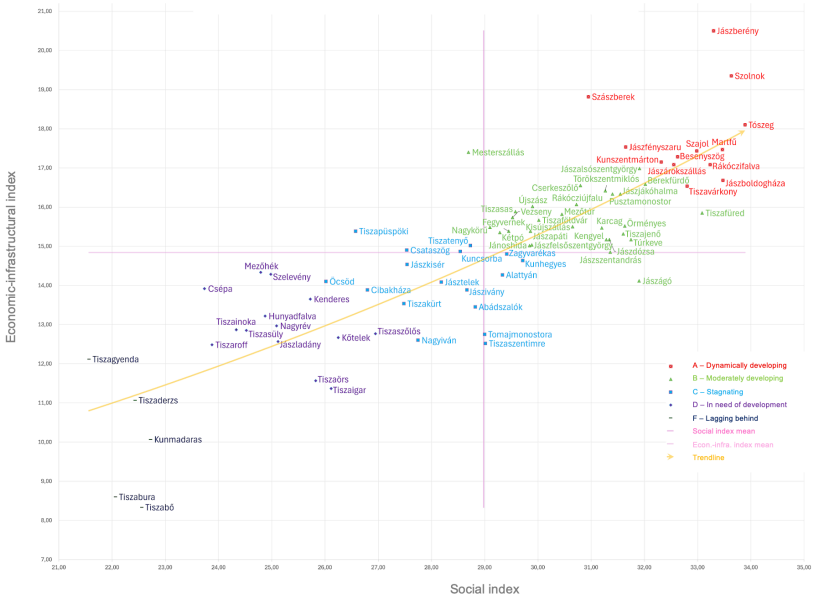


Figure 7: Development position of the 78 settlements of Jász-Nagykun-Szolnok County in the two-dimensional space of the composite development index, 2023

Source: Own calculation and compilation (2026)

Over the decade, the county's average composite development index rose from 41.83 to 43.82 (+4.8%), but the improvement was asymmetric: the mean of the social sub-index rose (+6.6%), while that of the economic sub-index stagnated (+1.3%). 67% of settlements retained their quintile classification, yet polarisation intensified: the standard deviation of the composite index rose from 4.97 to 5.16, and the gap widened at both ends of the ranking. Among the upwardly mobile settlements, Kunszentmárton ($2^{nd} \rightarrow 1^{st}$ quintile) and Tiszajenő ($3^{rd} \rightarrow 2^{nd}$ quintile, the biggest rise in rank in the county) stand out; those sliding downwards include Tiszafüred ($1^{st} \rightarrow 2^{nd}$), Mezőhék ($3^{rd} \rightarrow 4^{th}$) and Tiszagyenda, which fell into the lagging category ($4^{th} \rightarrow 5^{th}$).

Polarisation within the county had a dual character over the decade: the economic-infrastructural dimension widened – its standard deviation rising from 2.06 to 2.18 and its range from 10.4 to 12.2 points, as the weakest settlement fell further and the strongest rose further – while the social dimension evened out slightly. The distribution, as a whole, shifted upwards compared with 2013, yet the rearrangement of the categories shows clearly that the middle field emptied while the two outer bands expanded (top category: 9 → 13; bottom category: 4 → 5). Behind this pattern lie the divergent trajectories of the two ends of the ranking: while the middle field moved upwards, the most disadvantaged settlements (Tiszabő, Tiszabura and, by 2023, Tiszagyenda) fell further behind in relative terms. This is the textbook pattern of the development trap.

The settlements of the Kunhegyes District are found exclusively in the lower three categories, and their development trajectories have diverged: Kunhegyes and Abádszalók improved their position slightly, Tomajmonostora stagnated, Tiszaroff's position deteriorated, Tiszagyenda slipped into the lagging category, while Tiszabő and Tiszabura (swapping places with one another) remained the county's two lowest-ranked settlements throughout. Table 6 presents the sub-indices and composite indices of the

district's settlements for 2023, their ranking positions and the direction of change relative to 2013; the divergence between the economic and social ranking positions clearly indicates that the nature of disadvantage differs from one settlement to the next.

Table 6: Quintile indices, ranking and change of rank position of the settlements of Kunhegyes District (2023)

Settlement	Econ.-infra. index	Econ.-infra. rank	Social index	Social rank	Comp. index	Comp rank	Quint.
Kunhegyes	14,63	**47.** ▼	29,72	**39.** ▲	44,35	**43.** ▲	**3.**
Abádszalók	13,45	**60.** ▼	28,82	**49.** ●	42,27	**50.** ▲	**3.**
Tomajmonostora	12,75	**66.** ▼	29,00	**50.** ●	41,75	**54.** ●	**3.**
Tiszaroff	12,48	**71.** ▼	23,88	**73.** ▼	36,36	**73.** ▼	**4.**
Tiszagyenda	12,12	**72.** ▼	21,57	**75.** ▼	33,68	**74.** ▼	**5.**
Tiszabő	8,33	**78.** ●	22,56	**77.** ▲	30,89	**77.** ▲	**5.**
Tiszabura	8,60	**77.** ●	22,06	**78.** ▼	30,66	**78.** ▼	**5.**

Legend: ▲ improvement, ▼ decline, ● unchanged relative to the 2013 rank

Source: Own calculation and compilation (2026)

The results of the quintile ranking and the cluster analysis show a high degree of consistency, which supports the validity of both methods: the members of Cluster 5 (marginalised, segregated settlements – Tiszabő and Tiszabura) fall into the fifth cluster and the fifth quintile alike in both years; the members of Cluster 2 (economically dynamic but socially burdened settlements) are typically found in the first and second quintiles; the members of Cluster 3 (stable settlements with moderate problem levels) appear predominantly in the first and second quintiles; and the members of Cluster 1 (peripheral settlements of the Nagykunság) are typically located in the second and third quintiles.

The reliability of the ranking was verified by sensitivity analysis. Varying the weighting – equal weighting across dimensions, and z-score standardised weighting – left the ranking practically unchanged (Spearman's $\rho = 0.996–0.997$ in both years). In the jackknife procedure, which omitted each of the thirteen indicator

groups in turn, the ranking likewise remained stable (ρ = 0.975–0.998). Altering the classification procedure (value-range versus percentile-based categorisation) also left the ordinal structure stable (ρ = 0.949 and 0.941 respectively). The development ranking thus proved robust against all three perturbations, with Spearman's ρ at least 0.94 in every case, confirming that the resulting settlement hierarchy is a stable representation of the underlying development conditions.

3.4. Results of the correlation analysis

The Pearson and Spearman correlations between the census-recorded share of the Roma population in 2022 and the socio-economic indicators for 2023 are significant across every dimension examined ($p < 0.001$; $N = 78$) and fall in the moderate-to-strong range; the close similarity in magnitude between the two coefficients confirms the robustness of the pattern (see Figure 8).

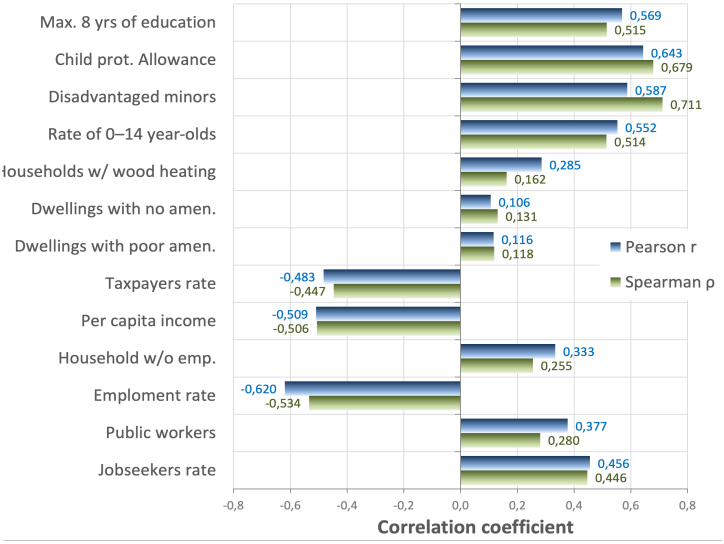


Figure 8: Correlation coefficients between the share of the Roma population and selected socio-economic indicators in Jász-Nagykun-Szolnok County (2023)

Source: Own calculation and compilation (2026)

The moderate positive association with unemployment (r = 0.457) is best read in terms of structural disadvantage – peripheral location and the absence of industrial capacity and of local jobs – rather than of Roma presence as such. The negative correlation with the proportion of personal income taxpayers (r = −0.483) indicates exclusion from the formal economy. The strongest association appears with the proportion of disadvantaged and multiply disadvantaged children (Pearson r = 0.587; Spearman ρ = 0.711, a strong correlation), pointing to the spatial concentration of the intergenerational transmission of disadvantage (see Figure 9). The positive association with the proportion of the population aged 0–14 (r = 0.552) reflects the younger age structure of Roma communities – this could represent a demographic opportunity, were it accompanied by appropriate educational and employment conditions.

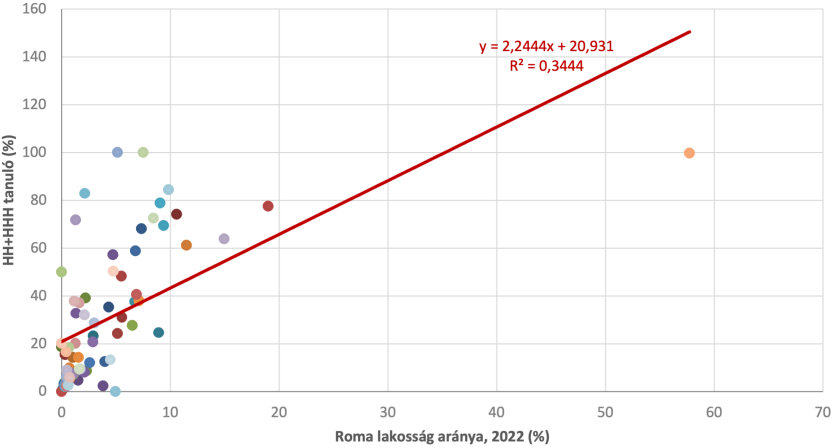


Figure 9: Relationship between the proportion of the Roma population (2022) and the share of disadvantaged children (2023) in JNSZ County

Source: Own calculation and compilation (2026)

The correlation patterns also converge with the cluster analysis: settlements with a high share of Roma residents consistently appear in Cluster 5 (marginalised) and in the lowest quintiles and

are concentrated geographically in the peripheral settlements of the Kunhegyes and Tiszafüred districts. Among the contemporary reproducing mechanisms, white flight and spontaneous segregation stand out, taking a distinctive form in Hungary that is manifest above all in the education system: free choice of school and the parallel structures of school maintainers allow non-Roma families to leave schools with a high proportion of Roma pupils, and higher-status families to send their children to neighbouring settlements or to church-run institutions. A statement of principle issued by the Office of the Commissioner for Fundamental Rights in November 2025 documented the connections between these practices and the school segregation of Roma children. All this points to a fundamental contradiction: legal regulation formally prohibits segregation, while institutional mechanisms reproduce it day by day – public education does not level out the disadvantages children bring with them, but frequently amplifies them (see Horn, 2013; Radó, 2018).

The relationship is correlational, not causal. Correlation analysis on its own records the association that is to be explained; what establishes its structural interpretation – as against the ethnocultural one – as the best explanation is the convergence of three mutually reinforcing sources of evidence of differing kinds (see Figure 10). The historical process analysis summarised in the literature review reconstructed the institutional mechanisms that created and preserved the spatial concentration of the Roma population, from the forced settlement policies of the Habsburg era, through the new patterns of segregation produced by the socialist settlement-clearance programmes, to selective out-migration after the change of regime; the fact that these decisions preceded the present situation in time is itself an argument for the direction of causality. The fieldwork – interviews with local leaders and experts, and the resident survey – revealed the local mechanisms, among them the forced relocation of several hundred Roma families during the creation of Lake Tisza, the

phenomenon of educational white flight, and the paradox of access to public services. The Hungarian and international literature alike support the structural explanation.



Figure 10: Methodological triangulation of the results of the correlation analysis

Source: Own calculation and compilation (2026)

The convergence of the three mutually reinforcing strands of evidence makes the structural interpretation the best available explanation of the data.

3.5 Results of the structured in-depth interviews

The seven local-leader interviews reveal three sharply different trajectories within the district: settlements in acute crisis (Tiszabő, Tiszabura), where the drug problem, a housing crisis and high segregation compound one another; settlements facing moderate challenges (Kunhegyes, Tiszagyenda, Tiszaroff, Tomajmonostora), marked by population loss and a thin supply of jobs; and a settlement on a positive path, helped in part by tourism (Abádszalók).

The explosive spread of synthetic drugs since 2020 surfaced strongly in every interview as a new structural challenge – in the words of Tiszabő's deputy mayor, *"drugs are the root of every trouble"* – and it is not confined to the most disadvantaged settlements: arrested dealers are swiftly replaced, or the problem

migrates to neighbouring villages. Recurring themes are the weakening of community cohesion, political division, and the personal pessimism of local leaders: Kunhegyes has lost a large share of its population over three decades, and most leaders spoke of an absence of any route out.

The expert interviews illuminated the system-level mechanisms. The presence of the Hungarian Maltese Charity Service is the area's single most significant external intervention, but its impact is ambivalent: alongside the achievements of the Sure Start Children's House, the Study Hall and the Bari Séj programme, social professionals flagged the risk of aid-induced dependency – well-meaning but paternalistic support that has fed the reproduction of structural disadvantage. The interviews confirmed the public-service access paradox and a chronic shortage of professionals, and, in the case of the FeTe programme, the tension between a presence-based ethos and project logic. The conditioned passivity discussed in theoretical terms in the literature became observable in the field as a concrete, three-generation pattern (cf. Szilvási, 2006).

The interviews with the seven Roma families documented the territorial trap at the micro level: not one family owned a working car, and labour-market discrimination clings to the name of the settlement (*"once they hear you are from Tiszabő…"*). Incomes vary enormously – from a monthly household income of HUF 500,000 to hand-to-mouth survival – yet the two characteristic livelihood strategies, the planning-and-calculating and the day-to-day-survival, operate within the same structural limits. The drug problem is the gravest theme in the family narratives too (in several families, children have lost all freedom to move about outside), while the public-service deficit – prepaid-card electricity, questionable water quality, a paediatric clinic open once a week, specialist care available only in Szolnok – is a constant added weight on everyday survival. Seen from below, the Maltese Charity Service's programmes are judged positively

but with nuance: the children's services have the most tangible effect, while the fairness of distribution draws criticism.

3.6 A Results of the resident survey

The 120-person sample represents the district's most exposed groups (64.2% women, 44.2% public-works employees, 50.8% with at most eight grades of primary school). The five-point self-assessment of financial situation reveals marked differences between settlements: at one end stand Abádszalók (3.38) and Kunhegyes (3.00), at the other Tiszaroff (2.10) and, at the very bottom, Tiszabő (1.24) – so the district's internal cleavage surfaces in subjective experience as well.

One of the survey's most important findings is the empirical confirmation of the paradox of entrapment: the intention to stay is highest precisely in the settlements with the worst financial conditions, driven not by positive attachment but by the absence of any alternative (Figure 11). The degree of spatial immobility is striking – 32–36% of respondents have never travelled beyond a 30 km radius, 64–76% have never crossed the county border, and 92% have never been abroad.

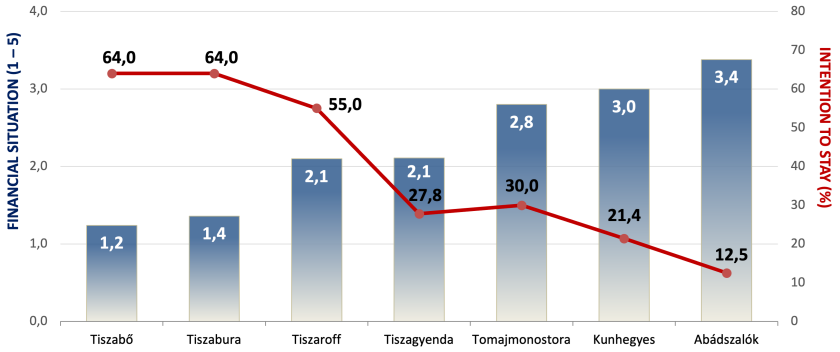


Figure 11: The paradox of entrapment – the relationship between financial situation and the intention to stay among the respondents, 2025 (N=120)

Source: Own calculation and compilation (2026)

In the twelve-item severity rating of social problems, drug use came first, confirming the interview findings. Outlook for the future is the most sharply dividing dimension: in Tiszabő 56% of respondents perceive decline (mean: 1.40), whereas in the better-off settlements a cautious optimism prevails. The survey's main conclusions are that inequalities between settlements are also plain in subjective experience; that the education–employment–financial-situation chain is empirically demonstrable (Figure 9); and that residents view the Maltese Charity Service's presence positively, though its effect is felt mainly in the fabric of community life and in institutional trust.

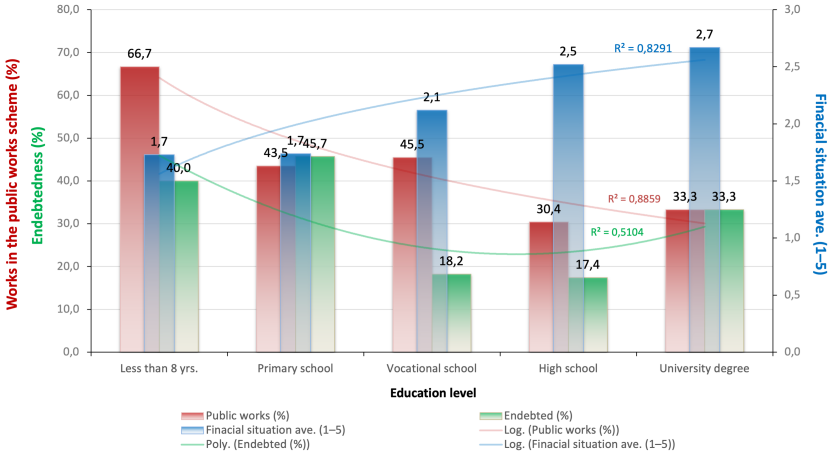


Figure 12: The relationship between educational attainment, occupation and the subjective assessment of the financial situation among respondents, 2025 (N = 120)

Note: on a 1–5 scale, where 1 = very poor, 5 = very good.

Source: Own calculation and compilation (2026)

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

The combined application of secondary and primary methods made it possible not merely to describe the territorial inequalities of Jász-Nagykun-Szolnok County, but to interpret them in their structure, their dynamics over time and their underlying mechanisms. The main conclusions of the research are the following.

- The territorial inequalities of the county cannot be reduced to a single dimension of economic development. The six mutually independent latent dimensions identified by the factor analysis and the five settlement types produced by the cluster analysis together demonstrate that demographic, economic, housing, public safety and educational disadvantages appear as a mutually reinforcing, cumulative system. Territorial disadvantage is therefore not a state but a self-reproducing process, one that cannot be addressed on the basis of one-dimensional classifications.
- The fault line between the Szolnok–Jászberény economic axis and the eastern, Nagykunság–Tisza periphery did not narrow over the decade examined (2013–2023); it deepened. While two-thirds of settlements held or improved their position, the two ends of the ranking moved further apart, and improvement occurred almost exclusively in the social dimension, alongside stagnation in the economic structure. The county displays the pattern of the development trap, in which general improvement conceals the relative decline of the most disadvantaged settlements. This carries a twofold lesson: monitoring built on averages and county-level aggregates is unable to detect precisely the phenomenon that catching-up policy exists to address, and interventions resting on social transfers and human development programmes cannot on their own break the self-reinforcing mechanism of the trap – lasting

convergence is possible only through the strengthening of the local economy.

- The preceding conclusion could be formulated only because the quintile-based ranking applied here works with value ranges and fixed boundaries and is therefore directly comparable across two or more points in time. Unlike percentile-based classification – which by definition creates groups of equal size at every point in time and thereby conceals absolute movement – this procedure preserves the information on actual change. It is consequently suited to tracking trajectories of convergence and decline over time and to designating intervention target areas transparently, and it can be extended to other counties and to the national level.
- The Kunhegyes District cannot be treated as a homogeneous development unit. Three development types can be distinguished – stagnating small-town centres (Kunhegyes, Abádszalók), villages in need of development (Tiszaroff, Tomajmonostora, and formerly Tiszagyenda) and deeply marginalised settlements (Tiszabő, Tiszabura) – and these settlements do not move together over time either. Uniform, "one-size-fits-all" programmes necessarily underperform, because they allocate their resources to the district average rather than to the actual distribution of disadvantage.
- Correlation analysis on its own establishes no more than association; three independent sources of evidence, however – the historical process analysis, the expert and local leader interviews, and the family interviews – consistently indicate that this association is explained by structural rather than ethnic factors: the spatial concentration of the Roma population is a consequence of cumulative structural disadvantage, not its underlying cause. Interventions must therefore target, alongside the strengthening of community agency, above all those institutional and market mechanisms that reproduce disadvantage: residential and educational

segregation, labour market discrimination, and inequalities in access to public services.

- The qualitative strand revealed what operates behind the statistical patterns: territorial disadvantage behaves as a self-reinforcing feedback loop. The paradox of enclosure – the highest intention to stay found in the worst-off settlements, fed not by satisfaction but by the absence of mobility alternatives – together with the paradox of access to public services suggests that unfavourable conditions and the absence of mobility reinforce one another. This loop, intensified further by the spread of substance use, extends across generations. The convergent direction of the quantitative indicators, the perceptions expressed in the interviews and the descriptions of mechanisms in the literature constitutes the best explanation of the available data, not experimentally verified causal proof.
- The three secondary procedures functioned not as checks on one another but as complementary perspectives: the factor analysis made the dimensions of disadvantage visible, the cluster analysis the settlement types, and the quintile ranking the order of development and the trajectories over time. That all three identify the same group of settlements as the most disadvantaged supports the robustness of the results; that the underlying mechanism became interpretable only from the interview material demonstrates the necessity of the mixed methodology.

On this basis, the overarching conclusion of the research is that the territorial inequalities of Jász-Nagykun-Szolnok County are not simple differences in development level, but self-reproducing systemic phenomena arising from the interweaving of demographic, social, infrastructural and institutional factors, and that reducing them is possible only through a differentiated development policy adapted to local circumstances and directed at structural causes.

4.2. Policy recommendations

Based on the empirical findings, the author puts forward development-policy recommendations in the following areas:

- A differentiated territorial-development approach built on the quintile categories, matching the type and intensity of intervention to a settlement's development position and to the nature of its disadvantage.
- Educational desegregation and human-capital development, guaranteeing disadvantaged and Roma students' access to quality education.
- Integrated mobility programmes that give those caught in the territorial trap a genuine choice between staying or moving on.
- Public-service development and infrastructural catching-up, to resolve the public-service access paradox.
- Cross-sectoral action on the drug problem, strengthening prevention and harm reduction and drawing in civil-society organisations with field-level knowledge.
- Local economic development and a gradual loosening of dependence on public works, with support for transitions into the primary labour market.
- Stronger institutional cooperation between civil-society organisations and local governments, making system-level use of the lessons of presence-based programmes.
- A transparent monitoring system that includes qualitative measures, tracking not only the hard indicators but also changes in community cohesion and subjective well-being.

The results of the research must be interpreted with several limitations in mind. (1) Data: the share of the Roma population is based on census self-declaration, which undercounts the actual proportion; the observed correlations should therefore be regarded as lower-bound estimates. (2) Sampling: the sample of the resident survey (N = 120) is neither random nor proportionate

– the two FETE settlements were deliberately over-weighted because of the central questions of the research (together 41.7%) – and district-level aggregates cannot therefore be treated as representative averages; the results are suited above all to identifying differences between settlements and to comparison with findings obtained by other methods. (3) The cross-sectional design does not permit direct causal inference; the structural interpretation is grounded jointly by the historical and the qualitative analysis. (4) Spatial and thematic delimitation: the study focuses on a single county and on the seven settlements of the Kunhegyes District, so extending the findings to other regions requires empirical validation, although the mechanisms identified (the spatial trap, the paradox of access to public services, conditioned passivity) are, according to the literature, not region-specific. (5) Temporal limitation: most of the fieldwork was conducted in the summer of 2024, after the appearance of synthetic drugs and during the after-effects of the COVID-19 pandemic, which may have influenced the cross-sectional picture.

Further avenues of research present themselves at several levels. Methodological directions include refining the quintile ranking and extending it to the national level, validating the indicator weights by the Delphi method, expanding the two points in time into annual time series, and incorporating subjective well-being measures and social indicators not currently available at settlement level (a segregation index, the NEET rate, life expectancy at birth, teenage pregnancies). Substantive directions include the epidemiological and criminological investigation of the spread of synthetic drugs in peripheral areas; the longitudinal study of the spatial trap and the paradox of access to public services; and, finally, an independent and publicly available impact evaluation of the catching-up programmes, above all of FETE, together with the mapping of segregated areas that belong administratively to towns but function as separate parts of the settlement.

4.3 Evaluation of the hypotheses

H1 – partially accepted

The first element of the hypothesis, that indicators of social circumstances form a factor of their own, was not confirmed. Of the six factors (75.16% of variance explained), F2 (housing deprivation) and F6 (educational deprivation) are explicitly social in character, but unemployment loaded onto F3 (composite peripherality). Social disadvantage is therefore not one-dimensional; it is embedded in several dimensions of territorial inequality. The second element, by contrast, was clearly confirmed: settlements with severe social disadvantage form a separate, clearly distinguishable group (Cluster 5: Tiszabő, Tiszabura), and the 92.3% agreement of the Ward method and the K-means validation confirms the robustness of the grouping.

H2 – accepted

The quintile-based composite development ranking proved a workable methodological instrument: it produced interpretable patterns consistent with the factor and cluster analyses and proved suitable for measuring change over time. It documented the intensification of polarisation (the standard deviation of the composite index rose from 4.97 to 5.16) and the relative loss of position of the Kunhegyes District (from 72% to 65% of the county average). The ranking is further supported by sensitivity analysis: neither varying the dimension weights (ρ = 0.996–0.997) nor omitting the indicator groups one by one (jackknife, ρ = 0.975–0.998) disturbed the order. The ranking offers a threefold advantage over factor and cluster analysis: it establishes an order of priority, it makes targeted intervention possible, and it measures change over time.

H3 – accepted

The seven settlements of the district occupy differing development positions, yet none reaches the top two quintiles: in the third, stagnating quintile stand Kunhegyes, Abádszalók and

Tomajmonostora; in the fourth, requiring development, Tiszaroff; and in the fifth, lagging behind, Tiszabő, Tiszabura and – having lost four places in the ranking by 2023 and slipped into this category – Tiszagyenda. The range of composite indices within the district widened from 12.3 to 13.7 points, meaning that the district lost ground not only in the county ranking but also polarised internally. The heterogeneity is confirmed by the comparison of the three secondary methods as well (the settlements fell into two or three different clusters), and the interviews refined the picture further: settlements that are statistically similar may differ considerably in community cohesion, in the severity of the drug problem and in the capacity of local leadership.

H4 – accepted, with the methodological limitations duly weighed

Moderate associations of consistent direction appear between the share of the Roma population and settlement-level socio-economic indicators: positive with unemployment ($r = 0.457$), with the proportion of disadvantaged and multiply disadvantaged primary school pupils ($r = 0.587$) and with the proportion of the young population ($r = 0.552$), and negative with the proportion of personal income tax payers ($r = -0.483$). All associations are significant at $p < 0.001$ ($N = 78$), and Spearman's rank correlation indicates a relationship in the same direction, confirming that the pattern is not distorted by a few outlying settlements. Correlation expresses association, not a causal relationship. Since, according to the literature, the census captures only a half to a third of the actual share of the Roma population, the observed coefficients should be regarded as lower-bound estimates. Convergence with the cluster analysis further strengthens the result.

H5 – accepted

The coincidence of three independent sources of evidence supports the conclusion that the association between the share of

the Roma population and settlement-level disadvantage is not necessarily ethnocultural, but is best explained by historical and structural factors. The historical process analysis documented, period by period, the institutional decisions that created this spatial concentration – from forced settlement under Habsburg rule, through the new patterns of segregation produced by the socialist settlement-clearance programmes, to selective out-migration after the change of regime – and the fact that these decisions preceded the present situation in time is itself an argument for the direction of causality. The expert and local leader interviews revealed the local mechanisms: the forced relocation of several hundred Roma families during the creation of Lake Tisza, and the mutually reinforcing effects of housing market segregation, educational exclusion and labour market discrimination. The family interviews confirmed the same process from a generational perspective. The coincidence of the three sources makes the structural explanation the best explanation of the available data, as local-level substantiation converging from several sources.

H6 – accepted

The qualitative methods revealed phenomena that cannot be read from the statistics: the spread of the drug problem, a differentiated picture of community cohesion, and the pessimism of local leaders. A key finding is the paradox of access to public services: providing services within segregated areas reduces the pressure to move, yet the absence of services does not generate mobility either – the spatial trap therefore calls for complex intervention. These findings are to be assessed not as independent conclusions of general validity, but as a deepening and contextualisation of the quantitative picture: the strength of mixed methodology lies precisely in the complementarity of the two approaches. Mixed methodology is thus not a luxury but a necessity.

5. NEW SCIENTIFIC RESULTS

Result 1: Using factor analysis based on thirty-five socio-economic indicators for the seventy-eight settlements of Jász-Nagykun-Szolnok County, I demonstrated that settlement-level territorial inequalities in the county are organised along six independent latent dimensions: demographic dynamics, housing deprivation, composite peripherality, public safety, entrepreneurship and educational deprivation. Indicators of social circumstances did not load onto a single factor but were dispersed across several dimensions; at the same time, I demonstrated by cluster analysis that severely disadvantaged settlements form a clearly distinguishable group under every clustering procedure applied.

Result 2: I developed a quintile-based, settlement-level composite development ranking method which, by combining economic and social sub-indices, classifies the settlements of Jász-Nagykun-Szolnok County into five development categories. I demonstrated that this approach gives a more detailed picture, and one more directly applicable to policy decision-making, than factor or cluster analysis alone: it establishes a development ranking, reveals the character of disadvantage, and captures change over time.

Result 3: Through secondary and primary research I demonstrated that the settlements of the Kunhegyes District do not form a homogeneous group in terms of development. Three distinct development types can be identified within the district, while over the period examined the development gap between settlements widened further within the district as well. The factor analysis, the cluster analysis and the quintile ranking all confirmed this internal differentiation, which suggests that a differentiated, settlement-specific development approach may be more effective than uniform treatment.

Result 4: Using correlation analysis I showed that in the settlements of Jász-Nagykun-Szolnok County there is a strong, statistically demonstrable association between the share of the Roma population and a number of socio-economic disadvantage indicators: the spatial concentration of the Roma population and settlement-level disadvantage demonstrably move together. The correlation establishes the co-movement of these phenomena, not a causal relationship between them.

Result 5: Through historical process analysis, and by comparing the results of secondary and primary methods, I showed that the association between the share of the Roma population and settlement-level disadvantage is not necessarily attributable to ethnocultural causes, but can be traced to historical processes and structural mechanisms – the legacy of settlement policy, housing market segregation, educational exclusion and labour market discrimination. The results indicate that the spatial concentration of the Roma population is primarily a consequence and an indicator of cumulative structural disadvantage, rather than necessarily its cause.

Result 6: Through qualitative primary research I demonstrated that, beyond the territorial patterns that quantitative methods can reveal, there are phenomena that fundamentally shape the development trajectories of settlements yet cannot be detected in the statistics. I showed that these phenomena may substantially affect the effectiveness of development policy interventions and cannot be uncovered by quantitative methods alone.

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