

**Theses for doctoral thesis (PhD)**

**In the land of networks.**

**The economy and society of the village of Nagyléta in Bihar County in the  
perspective of environmental history and network science, 1870-1929**

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## 1. Aim of the thesis, the outline of the topic

The main focus of the thesis is the exploration of the economic and social conditions of the village of Nagyléta in Bihar County between 1870 and 1929. Although my investigations on Nagyléta aimed at the historical deep-drilling of a turn-of-the-century village, I also tried to place the research results in a broader context, in the context of the Érmellék, the Lowlands and the Carpathian Basin. Part of the reason for starting the research in the early 1870s was that from 1871 the serf farmstead became an unrestricted free-market land property, from then on it was possible to sell individual plots of land in subdivisions, until then only the whole (former) serf farmstead (house, field and meadow) could be sold. Furthermore, the last great population catastrophe occurred in the early 1870s, the economic depression broke out in 1873, and the 1870s saw a turnaround in the grain market. The great grain boom ended and grain prices began to fall. These factors and processes, and the economic and social challenges they created, had a major impact on and limited the opportunities open to members of local society. I chose 1929 as the final date for the study because it allowed me to analyse the relationships system in local society over three generations.

My choice of topic was motivated by the fact that my research topic before my PhD studies was the economic and social processes of Nagyléta, which focused on the testamentary groups of the local society between the two world wars, and then on the impact of the Trianon state border on the village, which became a borderland village after 1920. Building on my previous research experience, I continued my studies of Nagyléta in the context of my PhD studies, extending the time frame of the study, which I tried to place partly in the context of environmental history and partly in the context of network science. In the field of environmental history research in Hungary, not many researchers have so far dealt with the outline of anthropogenic and natural processes involved in the transformation of a landscape, or with the complex study of climatic anomalies, crops and demography. I analysed the networks and interconnections of local peasant society based on the agrarian economy by incorporating the methodological tools of modern network science into historical research, which, to my knowledge, has never been done before in Hungarian social history writing. By revealing the kinship and artificial connections constructed in social space, group formation strategies that have long disappeared in local society can be understood in a different quality than before.

In the thesis I tried to examine three main historical issues, namely (1) the water regulation and draining of the marshes in the second half of the 19th century, (2) the impact of the border change of Trianon on the local economy and society, and (3) the demographic crisis in the

1870s and the demographic transition. Along these lines, one of the main objectives of the thesis was to capture the structural changes in local society and economy in the second half of the 19th century and the first third of the 20th century. Another question related to water management was how environmental changes were taking place in Nagyléta and the Érmellék and how local society was trying to cope with these changes, adapt and respond to the geographical challenges. How the continuous transformation of the landscape, changes in the use of the border, differences in the topography of the settlement and the economic potential of the sub-region have influenced the internal socio-economic relations of the local population, some local conflict fields and the frameworks that may constrain the agents' responses. How have climatic anomalies affected crop yields and how can this be linked to demographic trends? In the second part of the thesis, focusing on the relational networks of the Great Letta society, I interpreted local scale-free networks in three different contexts: godparents, marriage witnesses and marriage relations. The chapters based on the network approach mainly allowed me to add new building blocks to the methods and data visualisation used so far in similar studies in domestic social history writing. In addition to the distribution of degree numbers, I have also attempted to examine shortest paths, "small worlds" and network groups. A further objective of the thesis was to relate the research findings to the topic of the personal composition of popular godparents and godchildren, group formation and social mobility and integration.

## 2. Sources and methods

In this thesis, I used mainly quantitative methods of analysis. The main source base for the analyses of the chapters using the methods of historical demography and network analysis were the parish and civil registers of the Nagyléta. From the registers I built an MS Excel database, which proved to be the most time-consuming process in the work. The database provided the opportunity to trace individual families through the generations. The database built for the period between 1870 and 1929 is called the Historical Database of the Nagylétai Records and currently contains 19458 records. To study kinship and kinship networks, the database had to be able to link individuals, i.e. I had to create a relational database. After building the database, I had to assign a unique identity code to each individual. I started the coding with the first couple registered in the Reformed marriage register in 1870, and assigned a five-digit number as the code. I assigned codes from 10011 to 16960 to the persons in the database, which now contains 6949 persons. I used the family reconstruction method to link the individuals. To visualise the relationships that form in the social space, I used the network analysis software Gephi.

For tracing the landscape transformation in the second half of the 19th century and the beginning of the 20th century, I mainly used the military maps of the period (II, III military survey, 1941 military survey), the cadastral map of the settlement, the cadastral survey plans, the cadastral land register (all of which date back to 1888) and the cadastral land records of 1910. I have also included in the analysis statistical publications of the period showing land use at the settlement level. I have also created an MS Excel database from the 1888 cadastral register containing 8950 records. The land register recorded parcel numbers from 1 to 8932, as well as the name of the owner of the parcel, his/her place of residence by house number, the cultivation branch and the territorial extent. The particular value of the land register was that it was possible to reconstruct the extent of the floodplain for each parcel of land for the year 1888, and to determine the extent of the land belonging to each family in that year. I also built an Excel database from the 1864 land register and the 1910 cadastral land records, and based on the data from the three time sections, I drew conclusions about the local land tenure structure and the changes in the structure of (agrarian) society.

For the data visualisation of the maps in this thesis I used the geospatial software ArcMap, which has the advantage of being able to visualise large amounts of data relatively quickly. I used two different methods to represent the data on the map for the inner and outer areas of the municipality, the data were represented by points for the inner area and polygons for the outer area. First, I georeferenced a part of the 1888 cadastral map of the municipality in ArcMap software, then I assigned GPS coordinates to the parcels in the interior and polygons to the parcels in the exterior, and then I assigned the parcel numbers to the GPS points and polygons, thus making the MS Excel databases and the map linkable. By visualising the data on the map, for example by placing the residence of popular godparents and their godchildrens in the village interior, it was also possible to analyse the processes taking place in the physical space.

Although my studies are essentially micro-level analyses of economic and social history, I have tried to situate the results in meso- and macro-level processes and apply Bernard Lepetit's change of scale. Accordingly, for example, I compared the anthropogenic landscape transformation in Nagyléta with the economic and social processes taking place in the micro-region and the large landscape (Trans-Tisza Region, Great Hungarian Plain). I also tried to illustrate the changes in scale in the chapter analysing climatic anomalies, crop yields and demographic processes.

### 3. Results

#### 3.1. How did the anthropogenic landscape transformation take place in Nagyléta and in the Érmellék? How has the change in the landscape affected society?

In the second half of the 19th century, in the Great Hungarian Plain, especially in the Trans-Tisza Region, arable land was generally extended at the expense of meadow and pasture. In Nagyléta, the anthropogenic transformation of the landscape in the agricultural area of the Ligeti tagbirtokok, with the felling of forests and their conversion into arable land, had already begun in the 1860s, before the water drainage, so that the use of the landscape was partly divorced from the natural conditions of the land. In the area under study, the process was therefore different from the general one. With the clearing of the forests, the hydrological conditions of the landscape changed, allowing water run-off from the high ground to accumulate in the floodplains. According to the precipitation data from Debrecen, the climate became wetter at the turn of the 1870s and 1880s, which means that a natural process also contributed to the change in the landscape. Partly because of the more rainy climate and partly because of the inexpert attempts of the Nyírség landowners to drain the water, it became necessary to build drainage canals in the Érmellék, which led to the ex-ploughing of arable land in the 1890s. The expansion of arable land was largely on poor-quality sandy soils, and the use of the landscape was again divorced from the conditions of land. The new arable land has not provided a significant increase in income for the population of the micro-region. However, another process of landscape transformation unfolded in the 1890s in parallel with the construction of drainage canals, and in response to the phylloxera crisis, the exploitation of sandy soils as vineyards began in Nagyléta and Újléta, as well as in parts of the Érmellék. The planting of vineyards may have facilitated the grasping of open sandy areas, thus creating a land use and vine cultivation more adapted to the anthropogenic landscape transformation that had taken place earlier (1860s) (arable land replacing forests). The connection to the rail network and the expansion of viticulture could have had a positive impact on the economy of the area, opening the way to wealth creation, facilitating the transformation of peasant society and the acceleration of embourgeoisement.

One of the fundamental questions of environmental history is how the changing environment, the changing landscape, affects society. The poor yields of arable land on poor quality soils had a negative long-term impact on both the landowners of Újléta and Nagyléta. For a time, the high grain prices resulting from the cereal boom could compensate for the poor

yields, but from the mid-1870s, after the grain price drop, this was no longer possible. In the context of the transformation of the landscape, the groups of local society in Nagyléta that tried to benefit from the changes were investigated. In Nagyléta, the sand lands were overwhelmingly in the hands of local Reformed families. These families were among the wealthier in the local land tenure structure. A comparison of the 1888 cadastral land register data and the evolution of marital relations showed that the children of these families were not able to enter into a financially advantageous marriage. I have tried to trace the fate of the estates in the 1910 cadastral property sheets, for which it was possible to see that the parcels in the Ligeti tagbirtokok had been sold off by themselves or by their descendants, which may indicate that this part of the agricultural frontier still had a poor economic potential for arable farming. The situation of the Ligeti estates also changed with the phylloxera raid, with the revaluation of their immune sandy land, on which vineyards were established. However, the vines planted in Újléta were not in the hands of the local community but of vine-growers from the destroyed mountain vineyards who had the capital to replant. The local population, poor in capital, was unable to take advantage of the opportunity offered by the phylloxera in Újléta.

### 3.2. How did the economic and demographic crisis of the 1870s and the demographic transition take place in Nagyléta, the Érmellék and Bihar county?

The study of the demographic processes of the last third of the 19th century and the economic crisis of the 1870s was carried out on three scales, in the communes of Nagyléta, in the Érmellék and in the county of Bihar. The economic crisis that unfolded in the early 1870s started earlier and ended later in Bihar than in the country as a whole. The impact on demographics of poor harvest years due to weather anomalies diminished from the 18th century onwards in Europe with the modernisation of agriculture and the development of transport infrastructure, but even in the second half of the 19th century, the impact of successive poor harvest years at regional level could have been negative, especially on mortality. This can be inferred from the fact that in Bihar and the micro-region under study, the poor harvest years and the prolonged demographic crisis occurred in parallel. With regard to the demographic crisis, I have come to the conclusion that, contrary to László Katus's national demographic study, in Bihar and the Érmellék and Nagyléta, not only did the number of deaths begin to increase before 1873 – which had not yet turned into a natural decline – but, on the contrary, there was evidence of a natural decline in this region as early as 1871. An analysis of the various epidemics showed that the other epidemics together played a greater role than cholera in the demographic depression,

which means that the literature's claim that cholera is responsible for the demographic crisis is not valid at the local level. The impact of the epidemics in Nagyléta was different for the various religious groups, with Greek Catholics being particularly affected. Despite the excess mortality among the Reformed, the natural increase in the 1870s was positive, but the community was still in actual decline between the 1869 and 1880 censuses. This suggests out-migration, which may have been encouraged by successive years of poor harvests.

According to basic demographic indicators (infant mortality, crude birth and death rates), the demographic transition in Nagyléta has been different in many respects compared to the Carpathian Basin. The two largest denominations in the village showed different patterns of demographic behaviour. The demographic indicators of the Reformed were in line with the national trends from the 1890s, i.e. both births and deaths started to decrease steadily and were basically positive. This is a picture of a changing society. In comparison, the Greek Catholics maintained high fertility and high mortality rates for a longer period, and in their case infant mortality did not fall to the national level after the turn of the century.

### 3.3. How did the Trianon border affect the economy and society of Nagyléta?

The settlement's role as a market centre was preserved after the change of the border after Trianon, and the new state border probably also made the settlement's economy and society more dynamic. The 1920 border change did not have a profound impact on the region's economy because it was already gravitating towards Debrecen. However, the border change may have had a negative impact in one economic respect. At the end of the 19th century, the traditional vine-growing areas of the Érmellék and the area around Nagyvárad were in decline as a result of the phylloxera, which could have provided a market for the grapes grown on the sandy soil of Nagylétai, which had been given a new function by the transformation of the landscape. However, the region may have lost this market after Trianon, which may partly explain the lack of expansion of grape production in the period after 1920. In addition to the economic impact of Trianon, I also tried to explore how it affected the marital relations of local society. The calculations were carried out over several time periods, comparing the results obtained for the period after 1920 with the last third of the 19th century and the turn of the century. The results show that the different denominations present in the settlement were affected differently by the boundary change, with the Reformed first-married couples being least affected and the Roman Catholic and Israelite communities being most affected, although it should be added that occupation rather than denominationality may have played a greater

role. For while the Reformed were typically farmers, the Roman Catholics and Israelites were predominantly engaged in industry and commerce. Industrialists and merchants were more mobile and had a different pattern of marriage. Marriage relationships show that the state border only narrowly affects relationships, as in the case of Nagyléta, even before Trianon, among the settlements that became beyond the border after 1920, only the neighboring Bihardiószeg had closer relations, while the relationship with more distant villages was more occasional.

### 3.4. Who were the popular godparents and marriage witnesses and what role did they play in local society?

In the second half of the dissertation, I examined the hidden networks of the Reformed community of Nagyléta. The network analysis revealed group formation strategies that had long since disappeared. I interpreted local networks in three different contexts: godparents, marriage witnesses, and marital relationships. The network groups drawn from popular godparents' relationships showed that some groups in local society were organised around 'iconic' figures. In this way, a new form of group formation in local societies became possible. Some of the popular godparents and wedding witnesses successfully took advantage of the land acquisition opportunities of the second half of the 19th century. They were among the tobacco growers, local decision-makers and entrepreneurs, and took seats in the local council and presbytery. The ongoing transformations that characterized the period under study (changes in the use of the frontier, the topography of the agricultural frontier and differences in the economic potential of the microregion) all had a considerable impact on the internal socio-economic relations of local society, including the popular godparents and marriage witnesses. As decision-makers, these individuals had access to the resources of the village and, because of their network position, were important channels for the flow of information. As doers, they could actively shape local processes and influence the organization of society. Popular godparents included two pastors active during the period under study, whose invitation may have been a local custom. Károly Szűcs and Péter Marjai had different relationships, the former's godchildren's parents coming from a more differentiated wealth background, while the latter largely baptised the children of those with land, a network on which he later based his political activities. Some of the popular godparents developed the strategy of infertile or childless families, who probably sought to broaden their social network through godparenthood. In local society, the institution of godparenthood may also have been a possible means of integration for both the locally born

and the newcomers. It was through godparenthood that the social boundaries between Reformed and Greek Catholics could be crossed.

As far as I know, there has never been a precedent in Hungarian social history writing for exploring the relationship of engaged couples to marriage witnesses. The research offered an opportunity for a comparative analysis of the personal composition of popular godparents and marriage witnesses. The study found that there were individuals who were both popular godparents and marriage witnesses, but that the identity of godchildren and betrothed couples differed for the most part, with a few exceptions, so that the two institutions were also divorced. By placing the relationships of popular godparents and marriage witnesses in the spatial structure of the village interior, several patterns emerged. In the case of popular godparents and marriage witnesses from tribal families with farming occupations, the spatial arrangement of relations showed a density of relationships near the place of residence, which could be neighbourhood or kinship relations. Popular godparents and marriage witnesses could be considered to be persons of public esteem in this space. The occupational structure, wealth and spatial analyses suggested that the popularity of smallholding god-parents may have been based on the mere existence of a landholding or its size, and that for couples moving into the settlement, the invitation of public figures may also have been a possible way of inclusion in the local community, a channel of mobility.

### 3.5. What kind of mate selection strategies (relationships matching wealth) characterized the local community during the period under study?

In relation to the marriage strategy of peasant society, Hungarian social history and ethnographic literature has emphasized that couples were mainly from families of similar wealth and income. In the case of the Reformed community of Nagyléta, this thesis could not be proven based on the quantitative studies carried out for the period between 1883 and 1893, the turn of the century and the period between the two world wars, because the marriages were largely characterized by asymmetrical relationships. In addition to wealth, other positions played an important role in mate choice. For families with internal (endogamous) ties, it was possible to find that those who brought less wealth into the marriage generally had a larger internal network of ties in the local society, i.e. social embeddedness could be as important as land in the choice of a spouse. In the network emerging based on marriage relationships, only some of the central figures, the heads of families, belonged to the large farmers. In their case,

the development of multiple internal relationships within microgroups could also be a matter of prestige.



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## List of publications related to the dissertation

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- Buzgó, G.:** A csoportképződés lehetséges útjai Nagylétán a 20. század első harmadában.  
In: Demográfia & Politika : Kihívások, korlátok, alkalmazkodási módok. Szerk.: Csikós Gábor; Horváth Gergely Krisztián; Ö. Kovács József, Bölcsészettudományi Kutatóközpont, Budapest, 85-118, 2023, (Vidéktörténet, ISSN 2498-8804 ; 4) ISBN: 9789634163800
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8. **Buzgó, G.:** A regionális kutatások eredményeinek felhasználása (lehetőségek és korlátok) a mikroszintű vizsgálatokban.  
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9. **Buzgó, G.:** A nagylétai görögkatolikusok házassági kapcsolatai a 20. század első harmadában.  
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10. **Buzgó, G.:** Relațiile matrimoniale ale greco-catolicilor din Leta Mare în prima treime a secolului 20.  
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14. **Buzgó, G.:** Végrendelkező társadalmi csoportok Nagylétán 1932 és 1939 között.

*Halg. Műhtanulm. 4, 136-162, 2017. ISSN: 2063-6024.*

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