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## Creating a database to study settlement level socio-economic development and landuse-changes for the Hungarian Kingdom, 1550-1910.

*Keywords:* database, hGIS, mapping, 16-19<sup>th</sup> c., Hungarian Kingdom, Transylvania

*Summary:* It is well-known that the Habsburg Monarchy did great efforts to produce maps of all kind from the whole territory of the empire at the end of the 18th century. The so-called military mappings, available online for years at [www.mapire.eu](http://www.mapire.eu), were however not the only one and most detailed attempt. Unfortunately, the material of the subsequent cadastral mapping serving as basis for future taxation was destroyed by the local authorities after the death of king Joseph. But other conscriptions containing some economic and demographic data did survive. The HAS together with the National Archives decided to organize these data into data tables, publishing them online, then, as a next step to attach them to the existing contemporaneous cartographic material available at [www.hungaricana.hu](http://www.hungaricana.hu). The first effort was done by the Arcanum (the one that created the Mapire) available at <https://archives.hungaricana.hu/hu/urberi/> where the conscription of peasants from 1767 is connected to an OSM. The idea to visualize other datasets (at settlement level) available already in the online space of the state archives <https://adatbazisokonline.hu/> and to attach them to maps was extended to the Ottoman conscriptions (1550-1600s), the dicalis taxation of the Hungarian Kingdom (same era), the first Regnicolaris conscriptio after the Ottoman rule (1720), the Lexicon locorum (1775), the Josephinian census of 1785, the subsequent conscription of peasants and lands as basis for the planned cadastral mapping (1786). These were added to the more than 7 million settlement level data from the censuses and tax conscriptions from 1865, 1880, 1910, already available at GISta Hungarorum (<http://www.gistory.hu/g/en/gistory/index>), where GIS-basemaps are also available to create thematic maps. The project in its present stage can visualise any settlement level data on the „blank-shape” maps, which are georeferenced, thus can be superimposed on georeferenced historical map collections (like Mapire).

### Introduction

It is well-known that the Habsburg Monarchy did great efforts to produce maps of all kind from the whole territory of the empire at the end of the 18th century. The so-called military mappings, available online for years at [www.mapire.eu](http://www.mapire.eu), were however not the only one and most detailed attempt. Unfortunately, the material of the subsequent cadastral mapping serving as basis for future taxation was destroyed by the local authorities after the death of king Joseph (Rózsa 2018). But other conscriptions containing some economic and demographic data did survive. The HAS together with the National Archives decided to organize these data into data tables, publishing them online, then, as a next step to attach them to the existing contemporaneous cartographic material available at [www.hungaricana.hu](http://www.hungaricana.hu). The first effort was

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done by the Arcanum (the one that created the Mapire) available at <https://archives.hungaricana.hu/hu/urberi/> where the conscription of peasants from 1767 (Fónagy 2013) is connected to an OSM (Figure 1). The idea to visualize other datasets (at settlement level) that were already available in the online space of the National Archives <https://adatbazisokonline.hu/> (Figure 2) and to attach them to maps was extended to the Ottoman conscriptions (1550-1600s) (Figure 3), the dicalis taxation of the Royal Hungary (same era), the first Regnicolaris conscriptio after the Ottoman rule (1720) (Figure 4), the Lexicon locorum (1775) (Figure 5), the Josephinian census of 1785 and the subsequent conscription of peasants and lands serving as basis for the planned cadastral mapping (1786). These were added to the more than 7 million settlement level data from the censuses and tax conscriptions from 1865, 1880, 1910, already available at GISta Hungarorum (<http://www.gistory.hu/g/en/gistory/index>), where GIS-basemaps are also available to create thematic maps. The project in its present stage can visualise any settlement level data on the „blank-shape” maps, which are georeferenced, thus can be superimposed on georeferenced historical map collections (like Mapire). In this article we try to illustrate the diverse forms of utilization of these data through maps produced by us.

### Fraknóalja (SOPRON)

Név	Telek	Hold	Jobbágy	Zsellér	Házatlan zsellér
HG. ESTERHÁZY MIKLÓS	6.5	222	42	28	40

Térkép nézet

Metaadatok nyomtatása

Tartalom

- ABAÚJ
- ARAD
- ÁRVA
- BÁCS-BODROG
- BARANYA
- BARS
- BÉKÉS
- BEREG
- BIHAR
- BORSOD
- CSANÁD
- CSONGRÁD
- ESZTERGOM
- FEJÉR
- GÖMÖR
- GYŐR
- HEVES

Tartalomgazda

**mn** MAGYAR NEMZETI LEVÉLTÁR  
Magyar Nemzeti Levéltár Országos Levéltára

Figure 1: The first attempt to visualize conscriptions on map, the conscription of 1767 (<https://archives.hungaricana.hu/hu/urberi/>)

## Discussion and results

While most of the studies focus on the availability and possible usage of existing cartographic heritage, in this study we try something different – to reconstruct lost

cartographic material through the surviving basic data behind them and that way illustrating socio-economic conditions of the 18th c. Although the enlightened absolutism of the late 18th century provoked the opposition of the traditional elite by its unitarianism, which resulted in the destruction of the first systematic non-military cadastral mapping after the death of Joseph II, and even the landuse and crop output data were lost with the exception of few hundred settlements, the socio-demographic data of the first population census (1785) survived. The same is true for the conscription of serfs and their economic power, instruments, taxes and other services (1786). Thus, on the other hand, the highly centralized system of the state made it possible to create datasets that were not available in other countries, and in that case, local interests, that is the landlords', made their preservation possible. In other words, while the countries of the Holy Roman Empire were much developed their decentralized state structure makes the execution of similar investigations impossible for example on the area of present-day Germany, because of the differences in measurement units, term applied, and the difference in execution years. In Hungary, while the resistance of the noblemen destroyed the detailed civil mapping of Hungary, thus we have no knowledge on the large estates' landuse, the interests of the nobility required the preservation of data on peasants. The land used by peasants was only one third of the area of Hungary, but two thirds of the cultivated arable land belonged to this category, as the expansion of latifundia/allodia was not so advanced that time, because grain production was not the main profile of nobility until the grain prosperity under Napoleon. Herds and flocks were kept on communal pastures. Thus the settlement-level summary of the conscription from 1786 offers plenty of possibilities to illustrate the regional diversity of the situation.

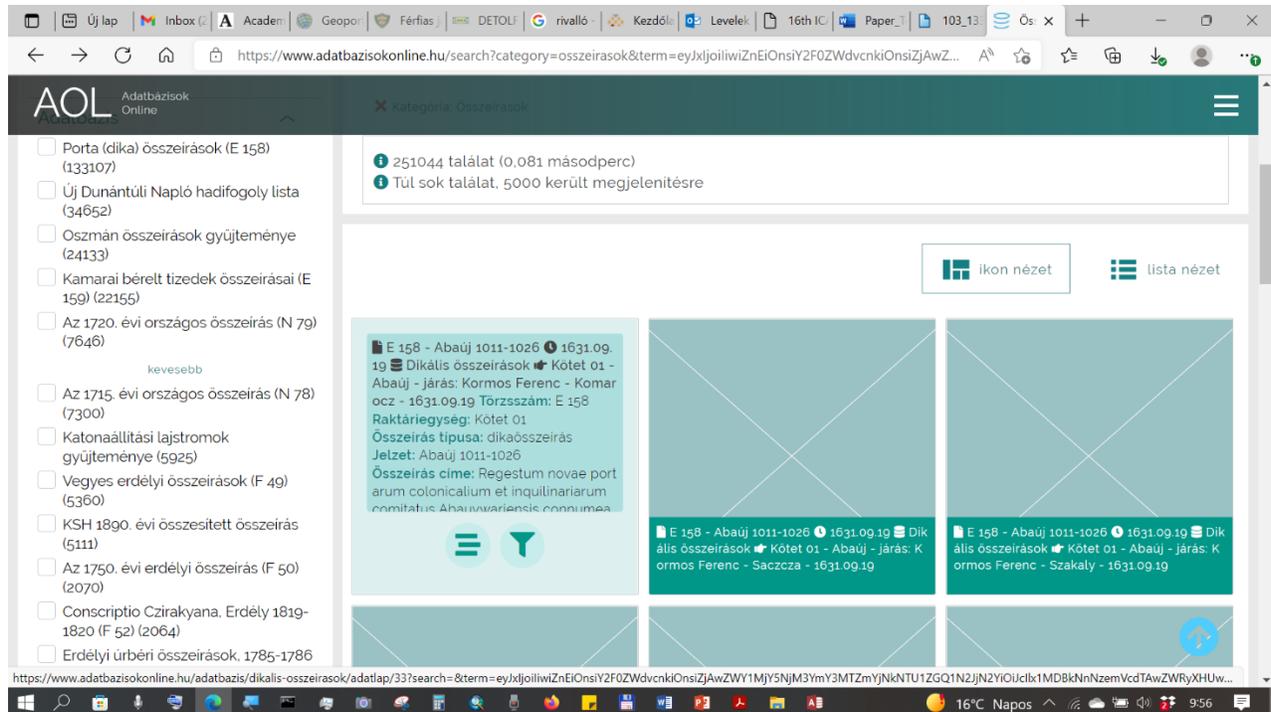


Figure 2: Conscriptions organized into database by the National Archives available in digital form (unmapped, listed in left, individual search results in the centre)

<https://adatbazisokonline.hu/>

However, in Transylvania, treated as a separate province this conscription was not carried out at all, therefore we have to rely on the detailed data of the 1750s (Gyémánt et al 2016). This gap of thirty years not only means that measurement units or social processes changed making Transylvanian data incomparable of the dataset from 1786, but also the terms applied in the conscription were different or their meaning went through modification during these 30 years. The same is true for the first official conscription of Hungary after the expulsion of Ottomans (1715/1720). Though this conscription was carried out in Transylvania too, its indicators were less diverse than in 1750, not to mention in 1786, the categories and terms also differed. But, on the other hand it also focused on rural economic power, as its focus was on the conscription of the peasants with land and landless – including their landuse, whereas most of the nobility was excluded from the conscription because of their tax-exemption (with the exception of poor noblemen, who paid tax too). The latter conscription is available online and organized into a database.

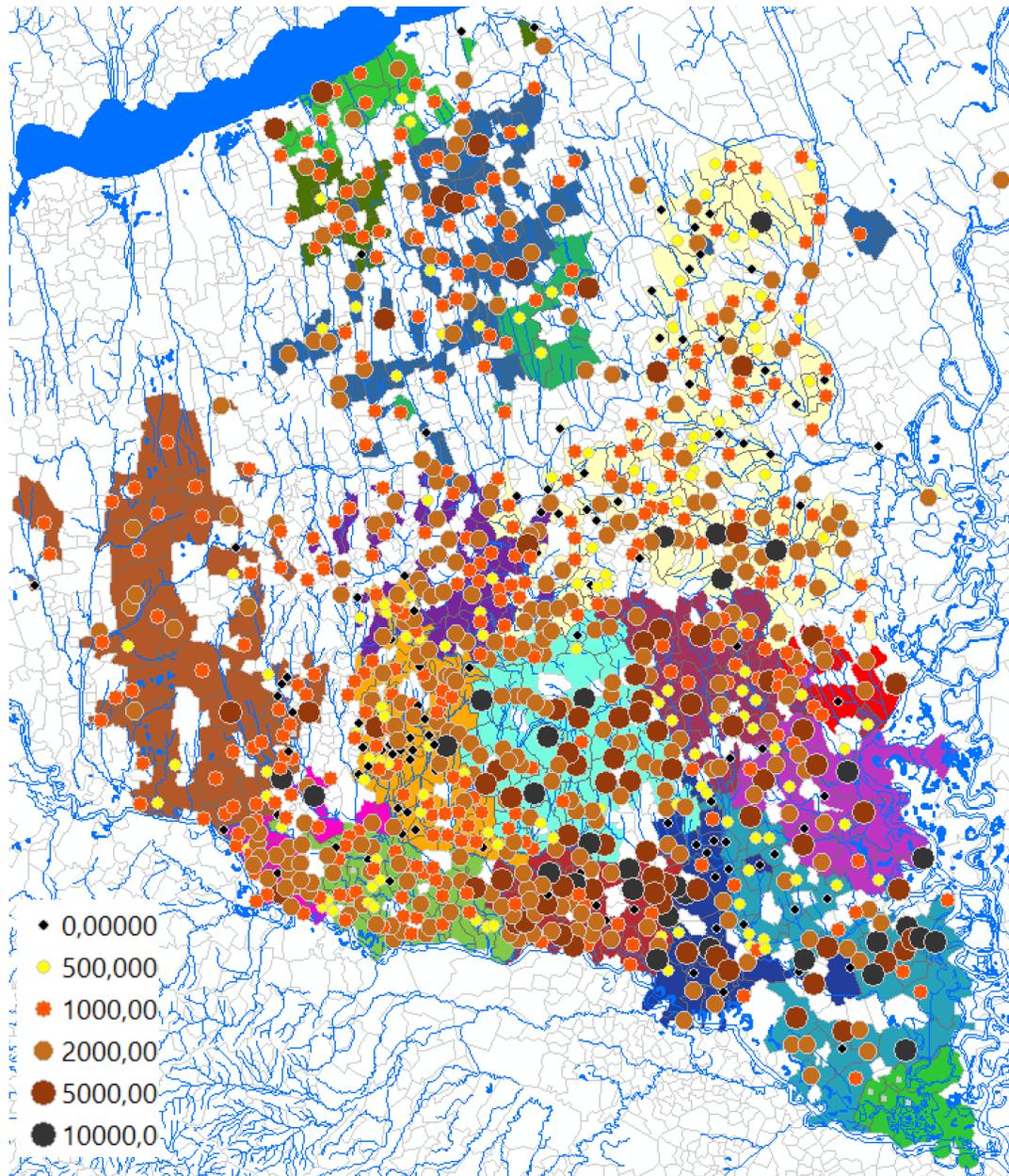


Figure 3: Tax paid by settlements after the first years of Ottoman occupation (1546) and the spatial extension of organized Ottoman administrative units (nahiyeh) – data derived from databases seen in Fig. 2.

Finally one should say few words about the problems of the first official census of Hungary (extended to Transylvania too) in 1785, which focuses on social, rather than economic phenomena and categories. However, the terms it uses is very confusing, and can't be compared to the terms used in 1786 – neither in 1750, nor in 1720. The

categories (inquilinus – peasant without sessio) do not even refer to economic condition (they could lease land if they had money, they could be craftsmen too) and do not even match modern terms (e.g. children – since the children of noblemen and the first-born son of peasants with landholding were not included into this category, we cannot reconstruct the proportion of children), because the main purpose of the conscription was to assess military potential (how many persons can be recruited without destroying the economic potential of the country to supply soldiers and other non-peasant layers) (Szántay 2014a, 2014b, 2015). Thus its value can be questioned from the side of modern sociology, similarly to the case of the conscription in 1786, when tax was paid after landsize (or per person) and not after the production/output. Therefore agrarian output values were not conscripted systematically at settlement level. However, there is still much to illustrate based on these mentioned conscriptions and first we try to enumerate the socio-demographic and economic indicators, then we try to illustrate phenomena on maps and in some (comparable) cases we even try to illustrate the changes over time, thus the dynamism of processes. Crude indicators can be combined (calculating %, or per capita values, temporal changes, etc.) resulting in new indicators, that can even substitute missing indicators as proxies. Right now the conscriptions from 1720 to 1910 are integrated (Figure 6) and by the end of 2024 the Ottoman and even the medieval data (Figure 7) will be under the same platform.

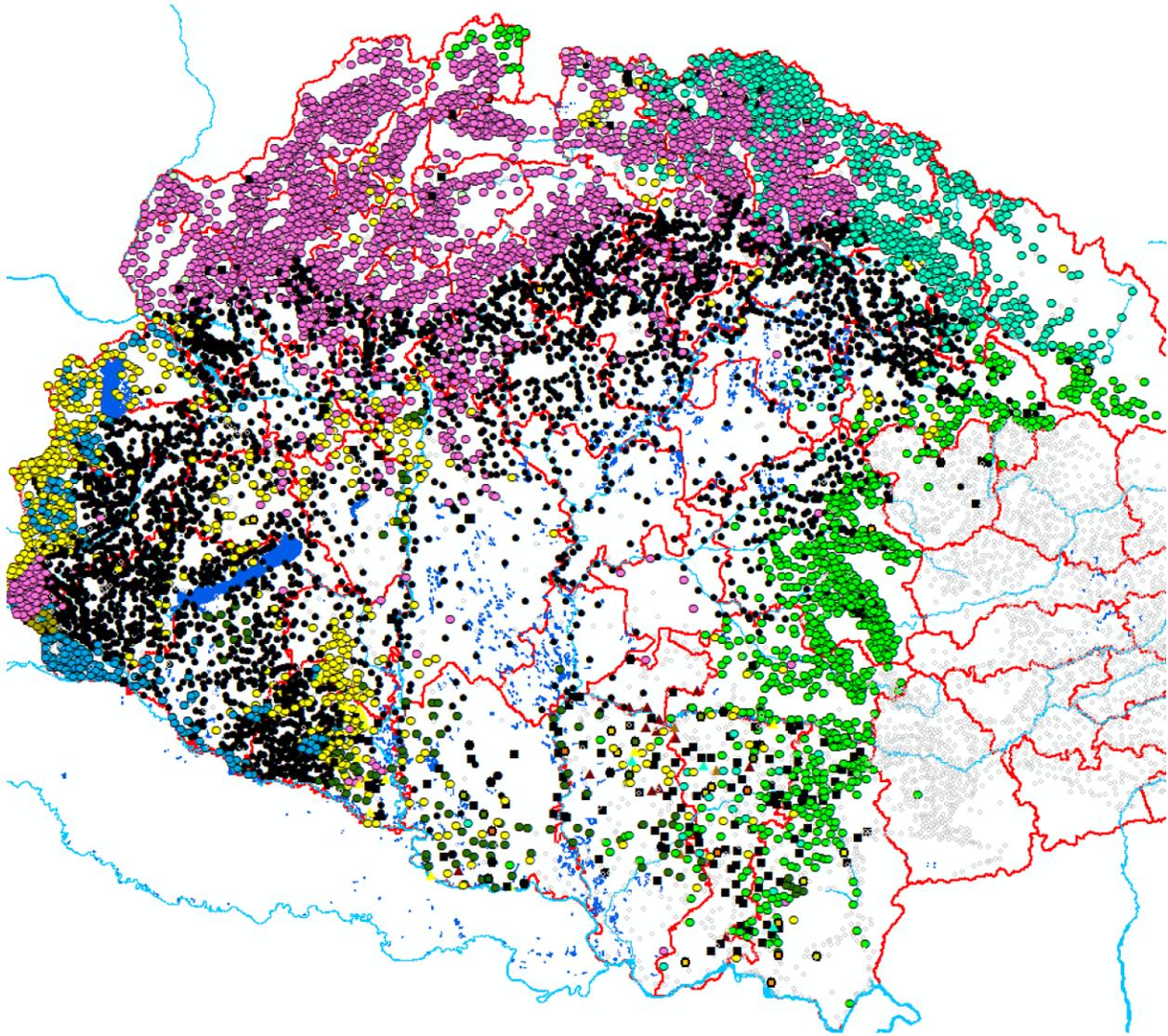


Figure 4: Languages of the Hungarian Kingdom in 1773 (Lexicon locorum... 1920)

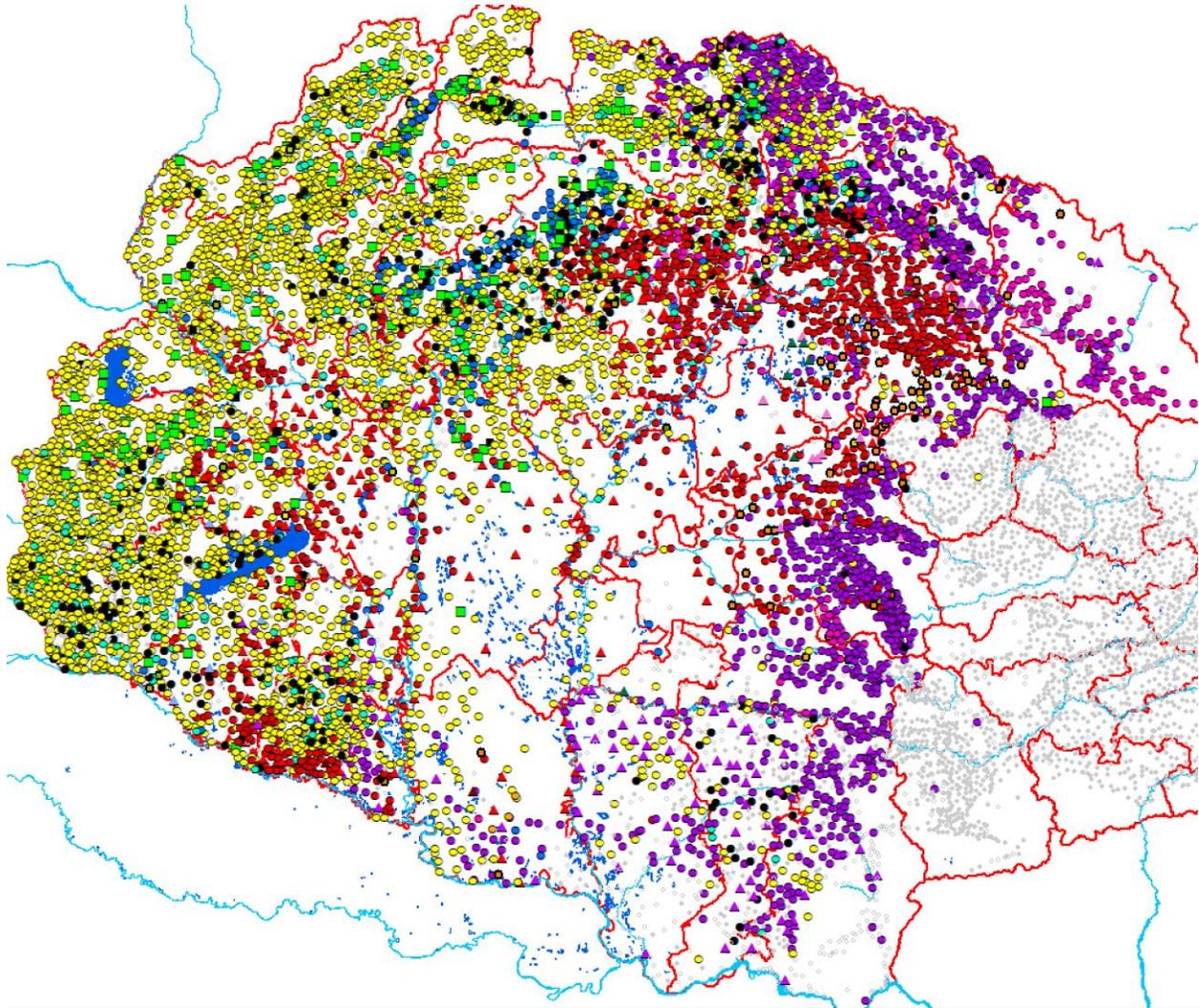


Figure 5: Dominant religions in the Hungarian Kingdom in 1773 (Lexicon locorum... 1920)

Minden Access-objektum

Keresés...

Táblák

- HUN\_1865\_landuse and income
- HUN\_1870\_population
- HUN\_1880\_ethnics\_religion NOT 1910 adminlevel
- HUN\_1880\_infrastructure\_literacy\_1910adminlevels
- HUN\_1880\_infrastructure\_literacy\_NOT 1910 adminlevels
- HUN\_1887\_PHARMACIES
- HUN\_1890\_ethnic\_religion
- HUN\_1895\_carriages
- HUN\_1895\_landuse**
- HUN\_1897\_POSTAL data
- HUN\_1900\_AGRARIAN SOCIETY
- HUN\_1900\_INDUSTRIAL STATISTICS

county	district	ID_settler	settlement_nar	number_estates	arable_cadastral	garden_cad_hc	meadow_cad
Baranya	Baranyavári	M0101020	Kisközszeg	525	293	49	558
Baranya	Baranyavári	M0101021	Lipovica	18	1416	9	52
Baranya	Baranyavári	M0101022	Kopács	283	1575	75	1090
Baranya	Baranyavári	M0101023	Kő	625	737	63	22
Baranya	Baranyavári	M0101024	Lapáncsa	82	383	95	115
Baranya	Baranyavári	M0101025	Laskafalu	190	1534	162	426
Baranya	Baranyavári	M0101026	Laskó	387	5597	106	328
Baranya	Baranyavári	M0101027	Lipova	202	1634	61	121
Baranya	Baranyavári	M0101028	Lőcs	293	1714	109	262
Baranya	Baranyavári	M0101029	Magyarboly	180	1976	110	207
Baranya	Baranyavári	M0101030	Németmárok	82	1257	58	95
Baranya	Baranyavári	M0101031	Monostor	537	2993	127	381
Baranya	Baranyavári	M0101032	Sárok	91	638	70	10
Baranya	Baranyavári	M0101033	Sepső	855	992	77	89
Baranya	Baranyavári	M0101034	Daróc	299	3293	88	467
Baranya	Baranyavári	M0101035	Villány	431	1162	145	537
Baranya	Baranyavári	M0101036	Virágos	47	500	20	113
Baranya	Baranyavári	M0101037	Vörösmart	592	3375	119	136
Baranya	Hegyháti	M0102001	Abaliget	122	946	26	158
Baranya	Hegyháti	M0102002	Nagyág	114	643	10	125
Baranya	Hegyháti	M0102003	Mocsolád	146	1380	14	325
Baranya	Hegyháti	M0102004	Bakóca	122	1458	54	200
Baranya	Hegyháti	M0102005	Bános	79	466	18	53
Baranya	Hegyháti	M0102006	Jenő	149	1024	11	224

Rekord: 1, összesen 13161

Figure 6: A table from the settlement level-database from the 1865-1910 period

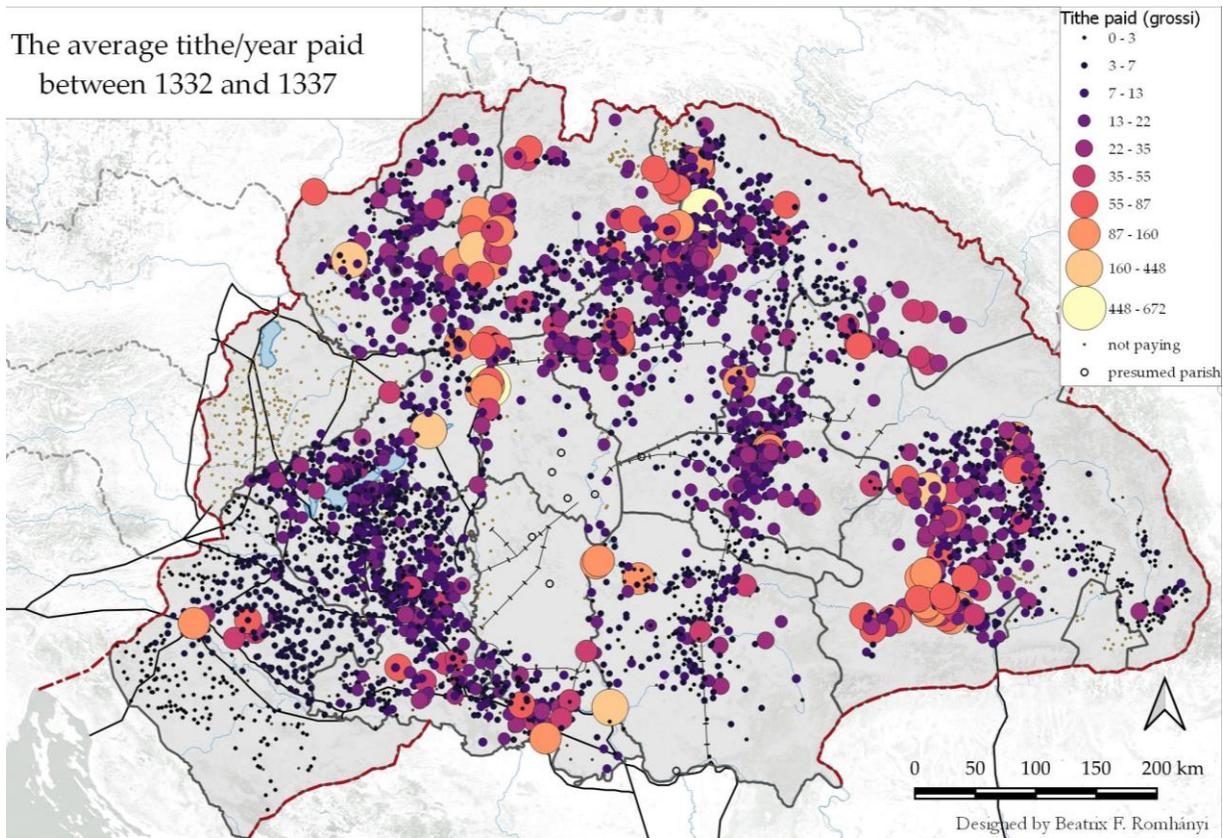


Figure 7: Tithe tax per parish as proxy of settlement level wealth for the middle ages

Dominant language and religion	Soil quality	Parishes	Teachers	Landed peasants (%)	Landless peasants (%)	Vineyard per one peasant	Arable land per one landed peasant (hold)	Children's proportion (%)	Compulsory workdays on allodia per peasant
Lexicon locorum (Transylvania is missing)	1786 (Transylvania is missing)	Lexicon locorum (Transylvania is missing)	Lexicon locorum (Transylvania is missing)	1786 (Transylvania is missing)	Josephinian (not all children included)	1786 (Transylvania is missing)			

Proportion of non-autochthonous	Proportion of absent	Family size (1785)	Family / houses (1785)	Change in proportion of	Proportion of	Proportion of cives (1785)	Proportion of un-	Value of services in nature per	Tax per peasant 1786
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population (1785)	person (1785)			landed peas- ants 1785- 1720 (%)	noble- men (1785)		mar- ried males (1785)	one peas- ant (1786)	(Transylva- nia is miss- ing and even some counties)
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Table 1. Some variables obtained from the raw data of the census in 1785 and other conscriptions of the 18<sup>th</sup> c. and the limitations of their use

First we show some examples how differences in landuse and land quality can be reconstructed at settlement level in the absence of cadastral maps using proxies (as we did it in the case of reconstructing medieval settlement level wealth using tithe tax/parish as proxy). We draw the attention that only land (arable and meadow) being legally at the disposal of the peasants are conscripted, allodial land, communal lands (pastures, forests) and land leased to peasants are not included (Figure 8-9)! Then we offer a possibility to illustrate the difference of population growth between 1720 and 1786 despite the fact the total population was conscripted first only in 1786 (Figure 10). The same approach is used to assess grain outputs which were not measured, but the combination of given three variables, land quality, landsize per landed peasant and family size, allow us to illustrate relative regional differences in outputs at settlement level (Figure 12).

Following this we show a map series on Transylvania illustrating not only local diversity (as a homage to the host city), but also drawing the attention to the more quantifiable set of variables compared to 1720 and 1786 (Figure 11). Finally we provide some maps on 1910 data (Figure 15-17).

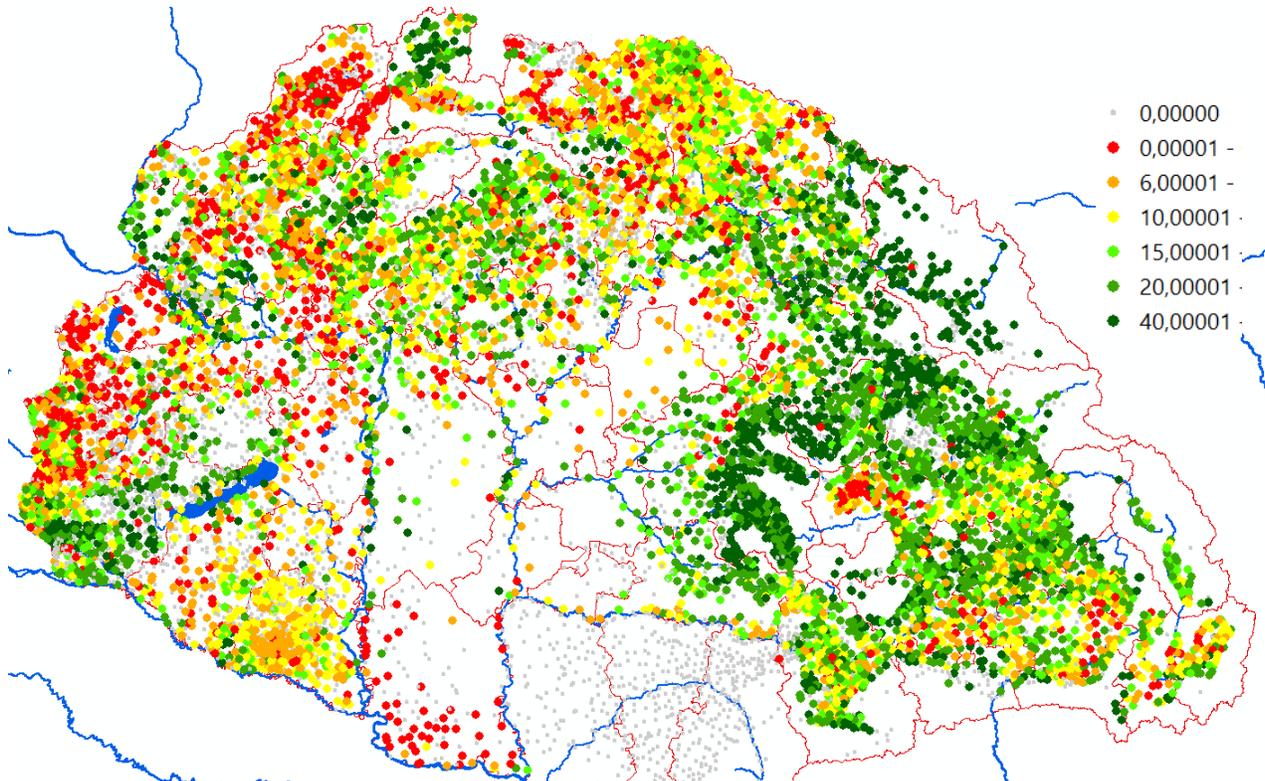


Figure 8: Proportion of meadows measured to arable land (%) in 1720

As basemaps for the settlement-level map the general cadastral maps of the 1910s (scale 1:144,000) were used up, which is the most detailed available map for hGIS purposes covering the total area of the Kingdom of Hungary and Croatia too (Figure 18).<sup>1</sup> This high resolution also enables us to calculate average morphological features for each settlement (Figure 14). The same map was used to create the settlement level administrative division in the 1780, but, since the settlement boundaries were not consolidated then (and we did not have similar map illustrating the administrative boundaries of the then existing settlements), we rather use points in illustrations instead of polygons for that time period. The same scale will be applied on the medieval maps after the necessary adjustments (Figure 13). Finally, all the settlements with their collected data will be visualized on a joint platform, like *Nodegoat* – in order to make them available for broad public (Figure 9b).

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<sup>1</sup> On Mapire one can find maps of better scale, but unfortunately these neither cover the whole area of the historical-country yet, nor originate from the same year (for example, some of the settlements constituting today's Ózd – a smaller town – have their first cadastral maps from the 1840s, while others from the 1890s, and the website usually fills the gaps in the 1850s by cadastral maps from the 1890s).

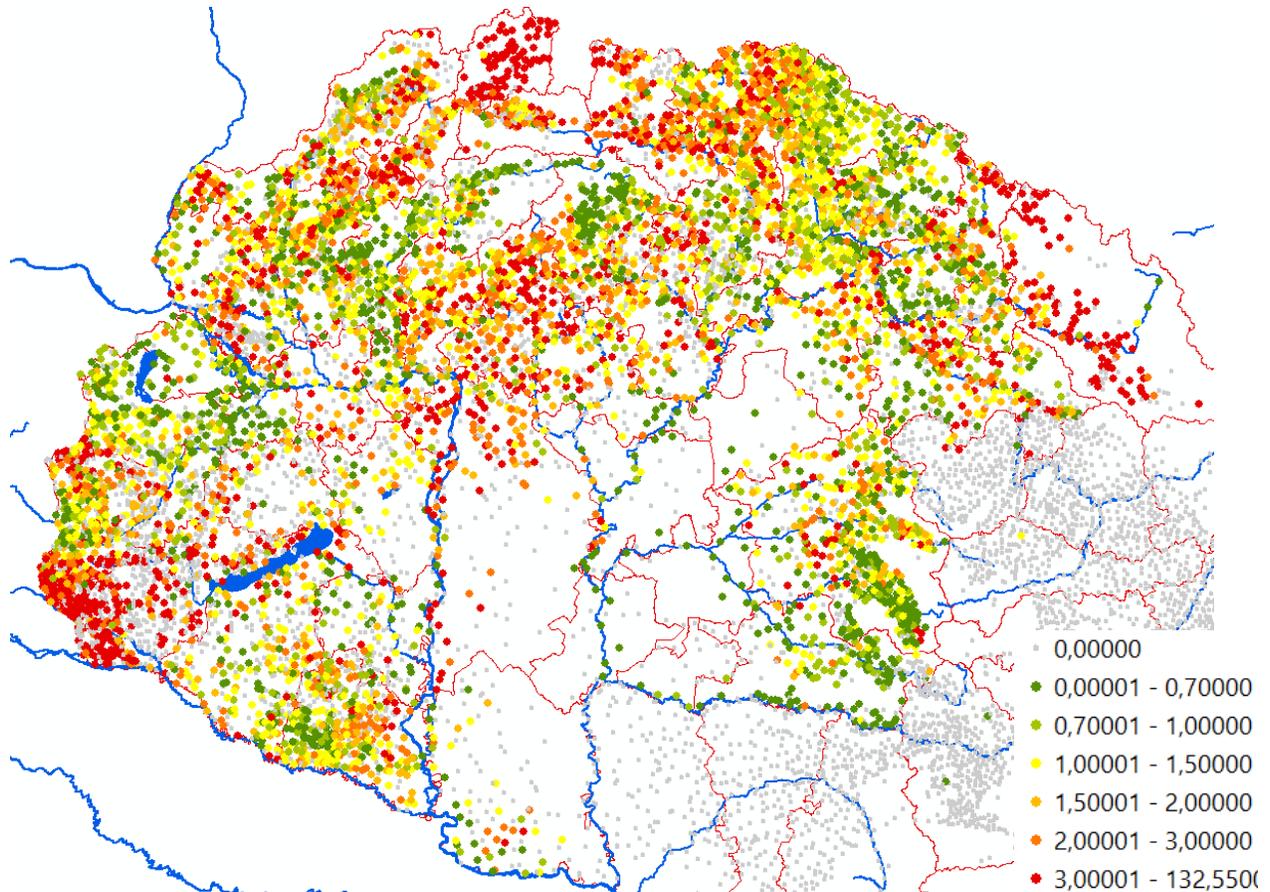


Figure 9. The change in size of conscripted land per one peasant (1786/1720)

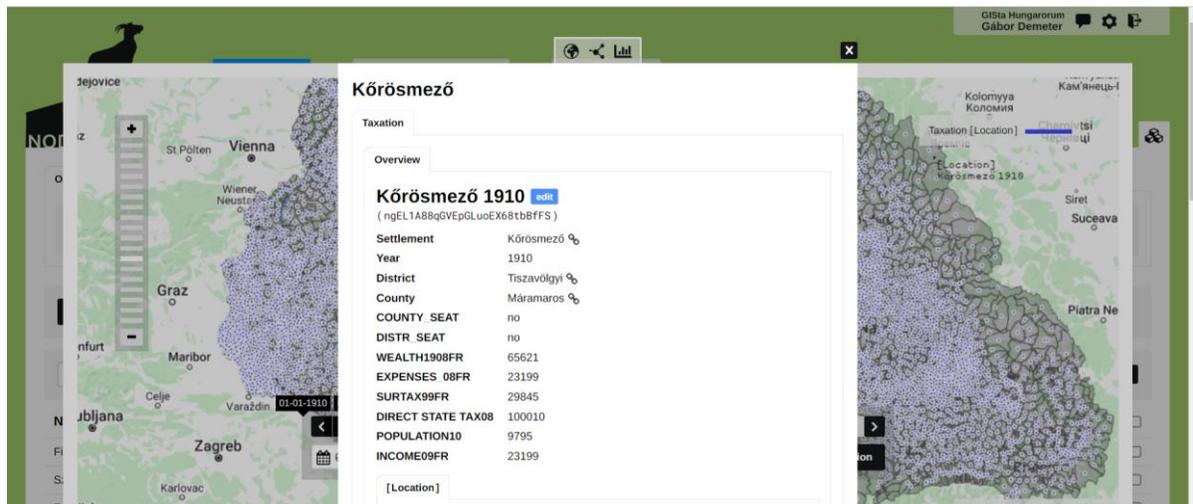


Figure 9b. Settlements visualized with their data under Nodegoat

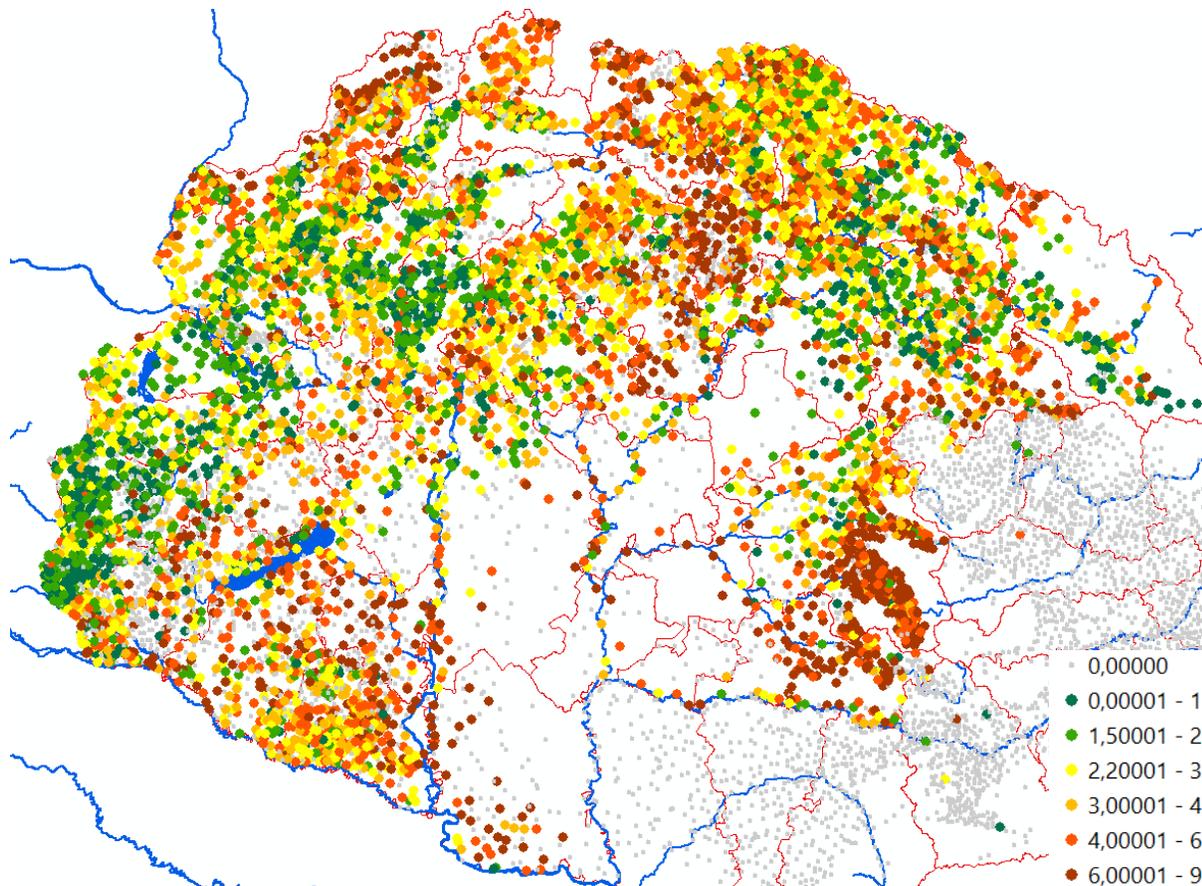


Figure 10. The change in number of all conscripted (including landless) peasants 1786/1720 reveals the major areas of population influx

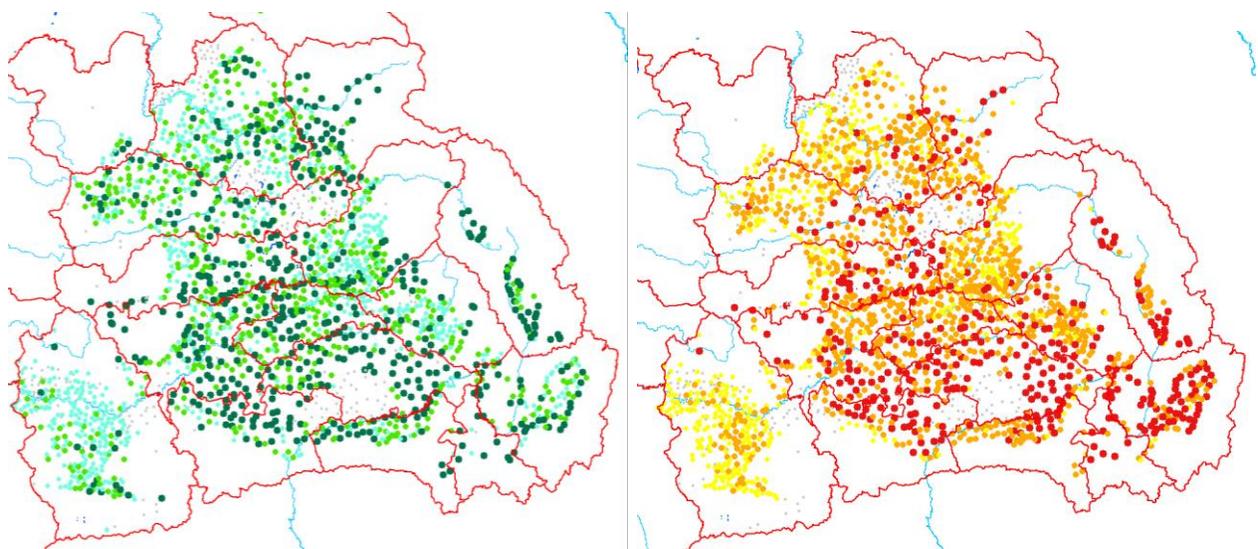


Figure 11. The difference in output of meadows (left) and arable lands (right) in Transylvania in 1750

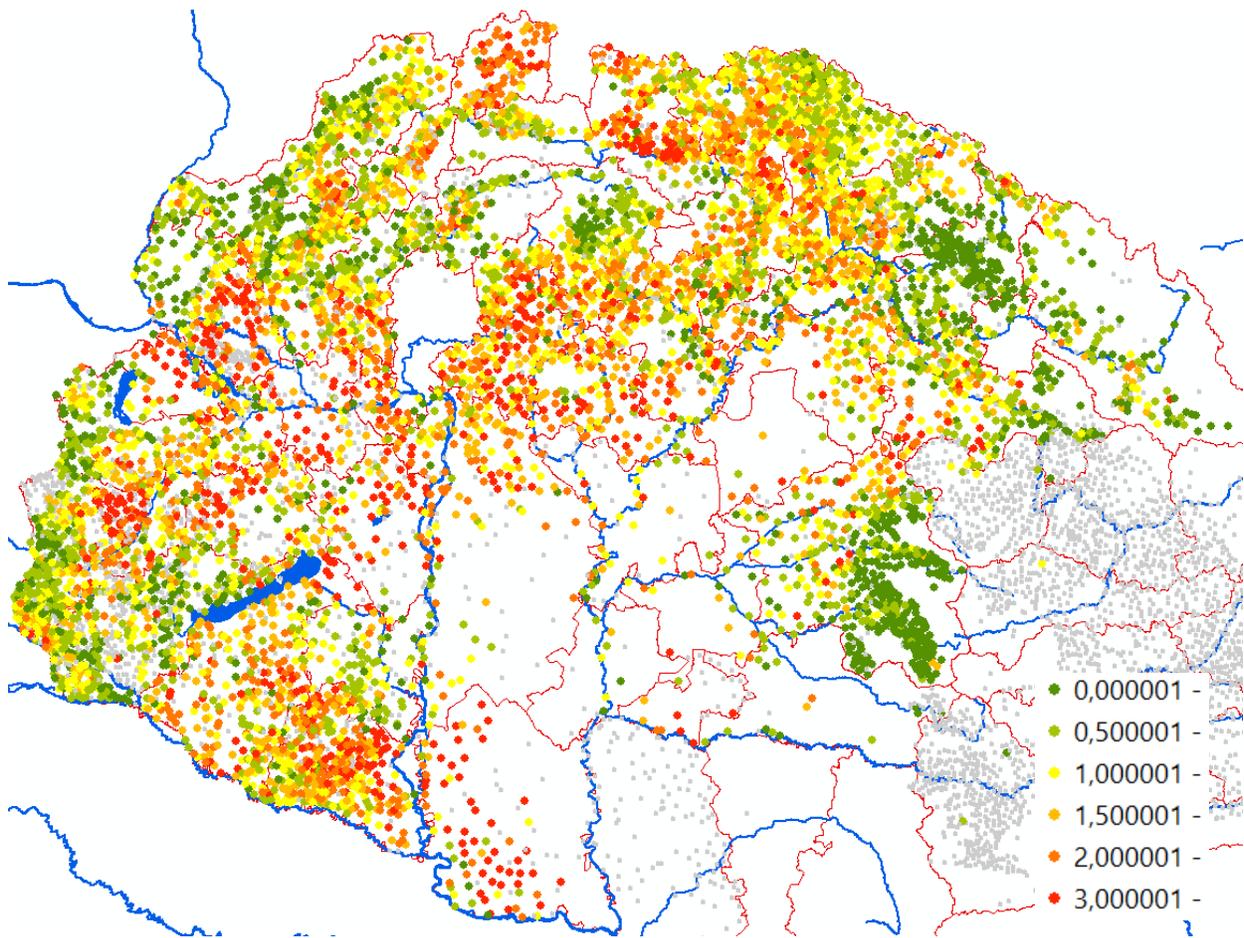


Figure 12. Arable landsize per landed peasant corrected by soil quality and family size (a dimensionless proxy of grain outputs, which was not measured in the second half of the 18<sup>th</sup> century).

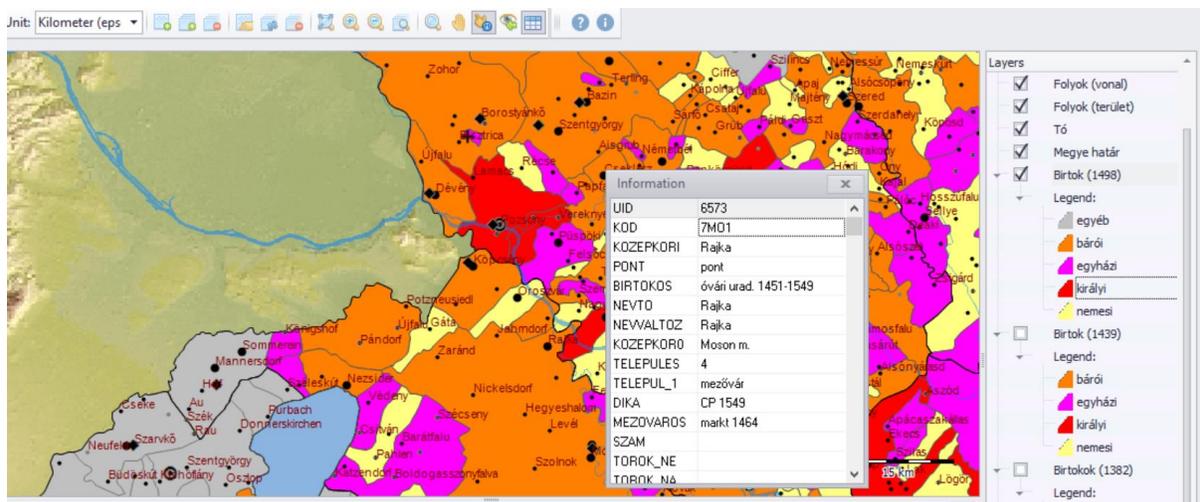


Figure 13. Parts from the hGIS map of estates and settlements in the medieval Hungary (so-called Engel-map, 1:400,000)

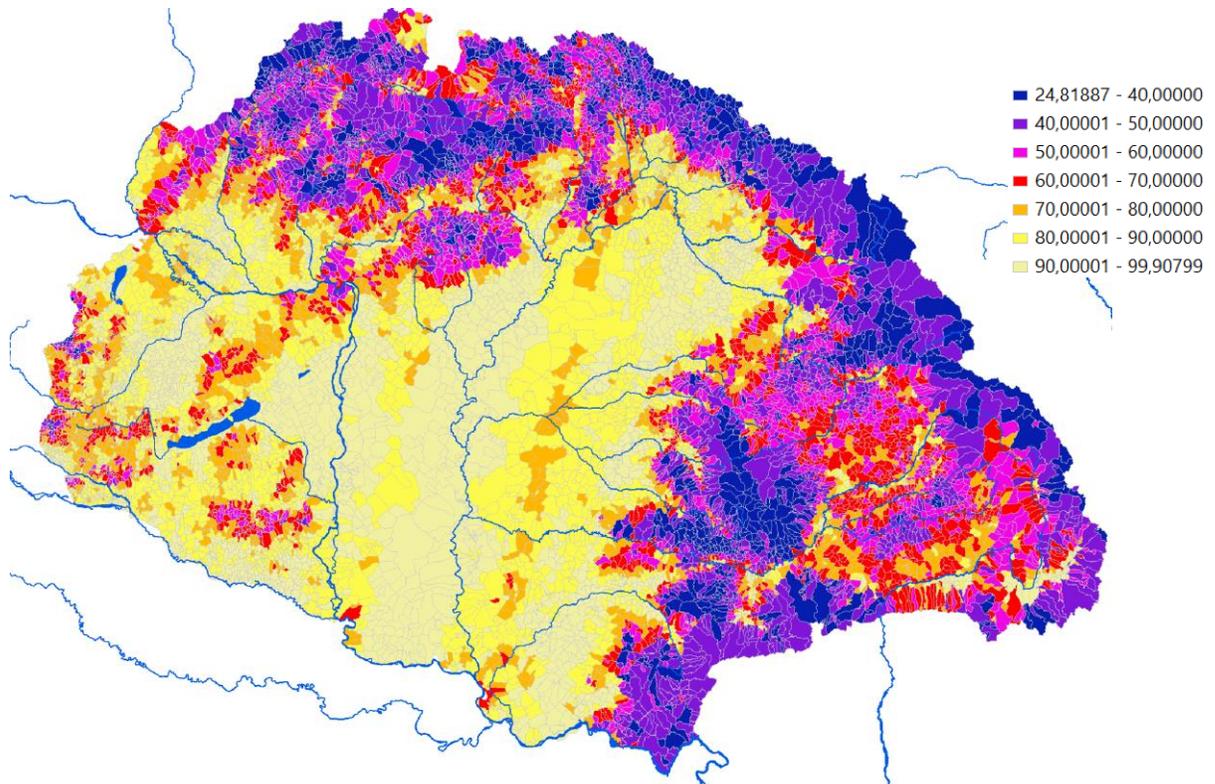


Figure 14. Relative frequency of slopes less steep than 17 degrees – polygonal network based on the topographic map (scale = 1:144,000)

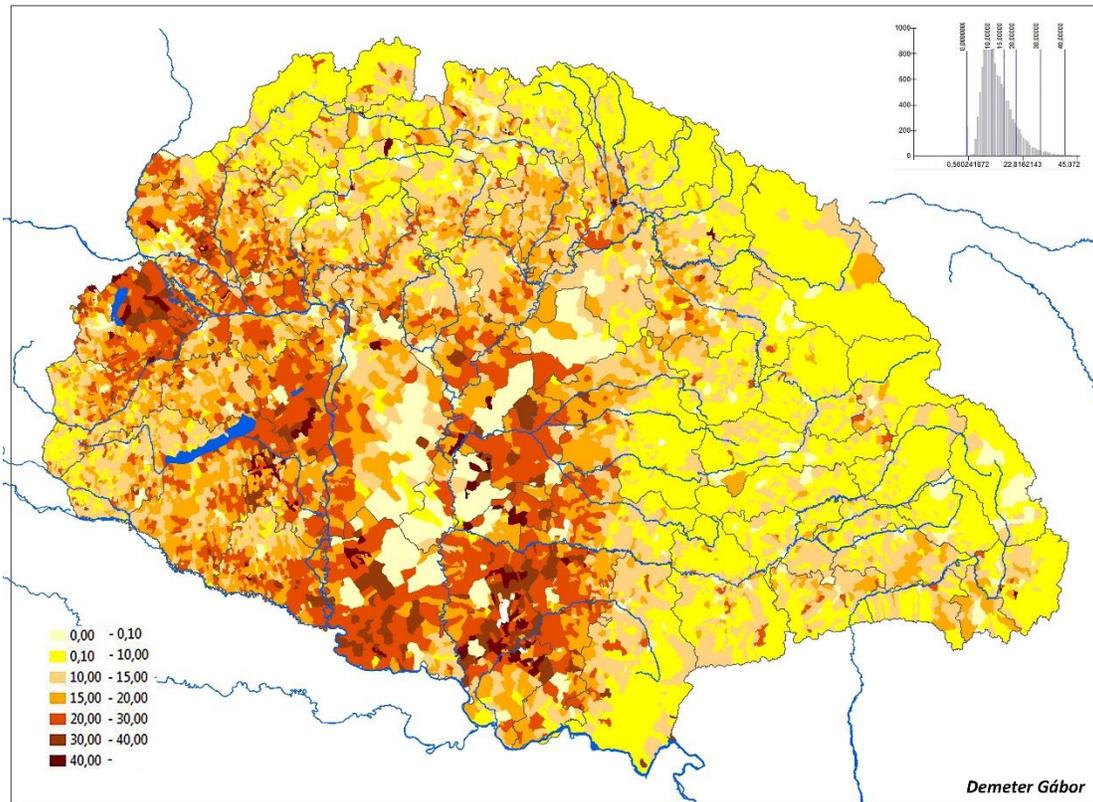


Figure 15. Direct taxes/capita (in 1909, in Kronen; data is missing for some cities in the plains)

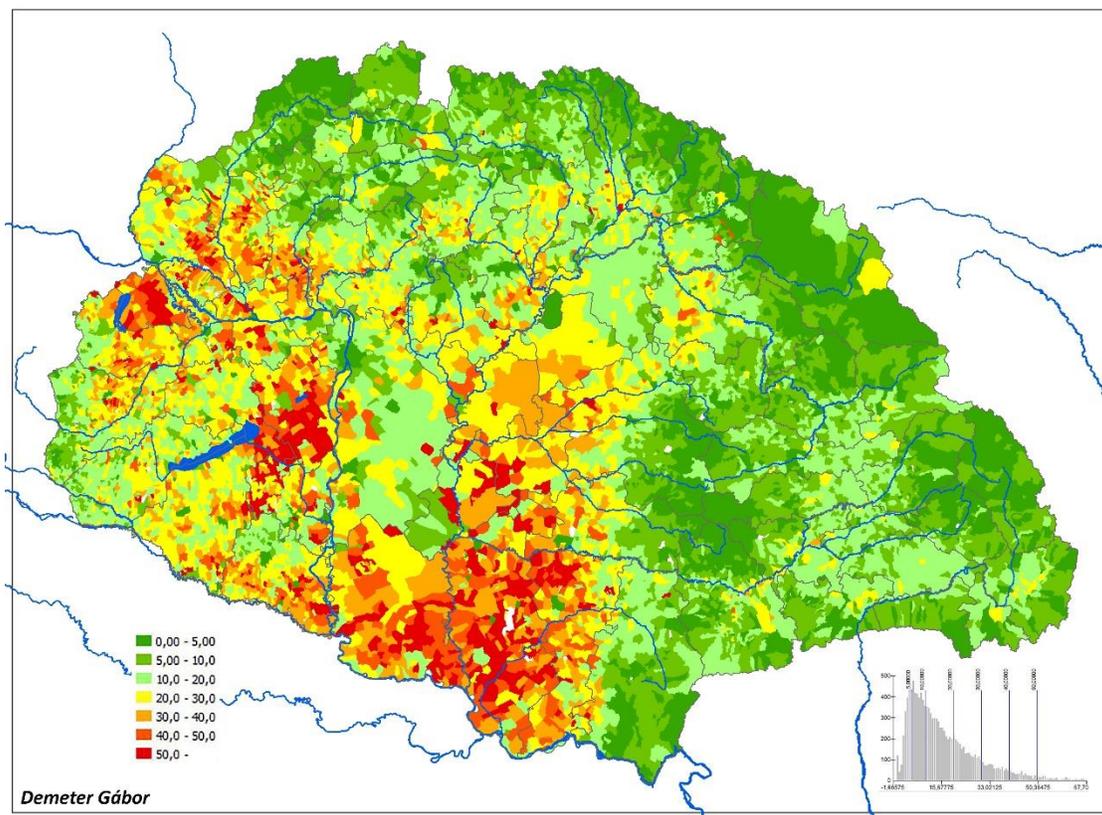


Figure 16. Regional differences in settlement level net crop incomes/capita (in 1909, in Kronen; husbandry is missing)

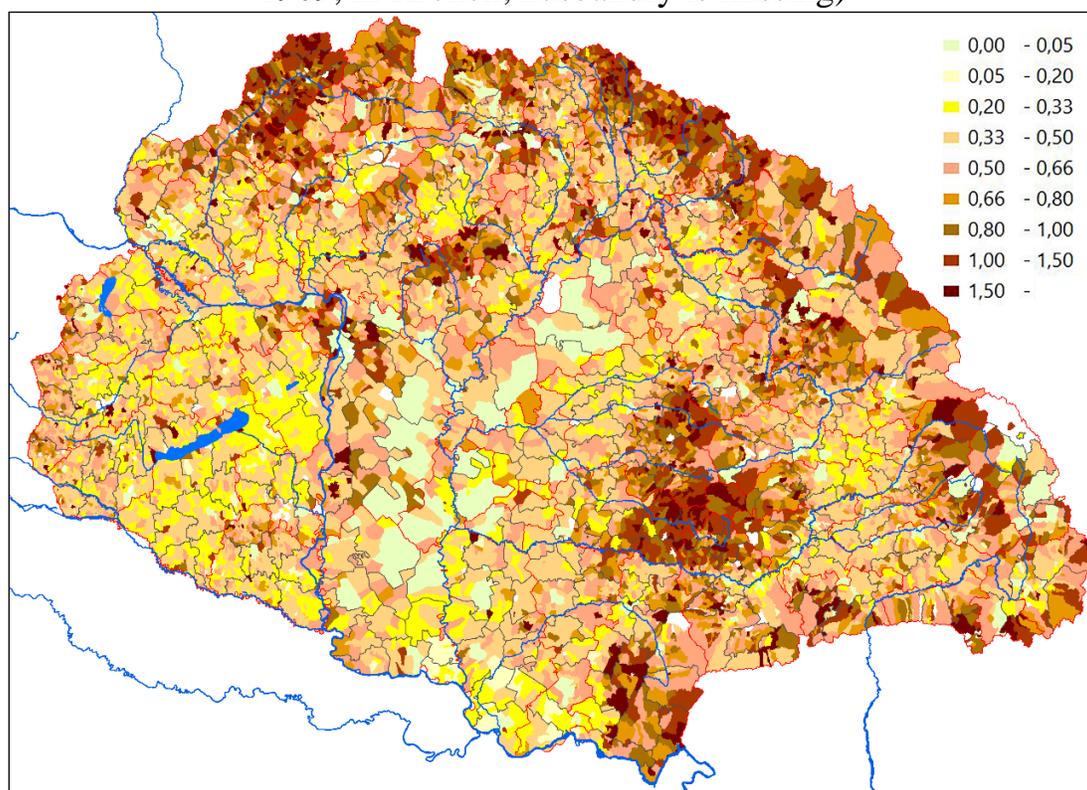


Figure 17. Regional differences of burdens vs income at settlement level: direct taxes compared to net crop incomes (1 = 100%, based on the above two maps – revenues from husbandry are not included, this distorts the real situation)

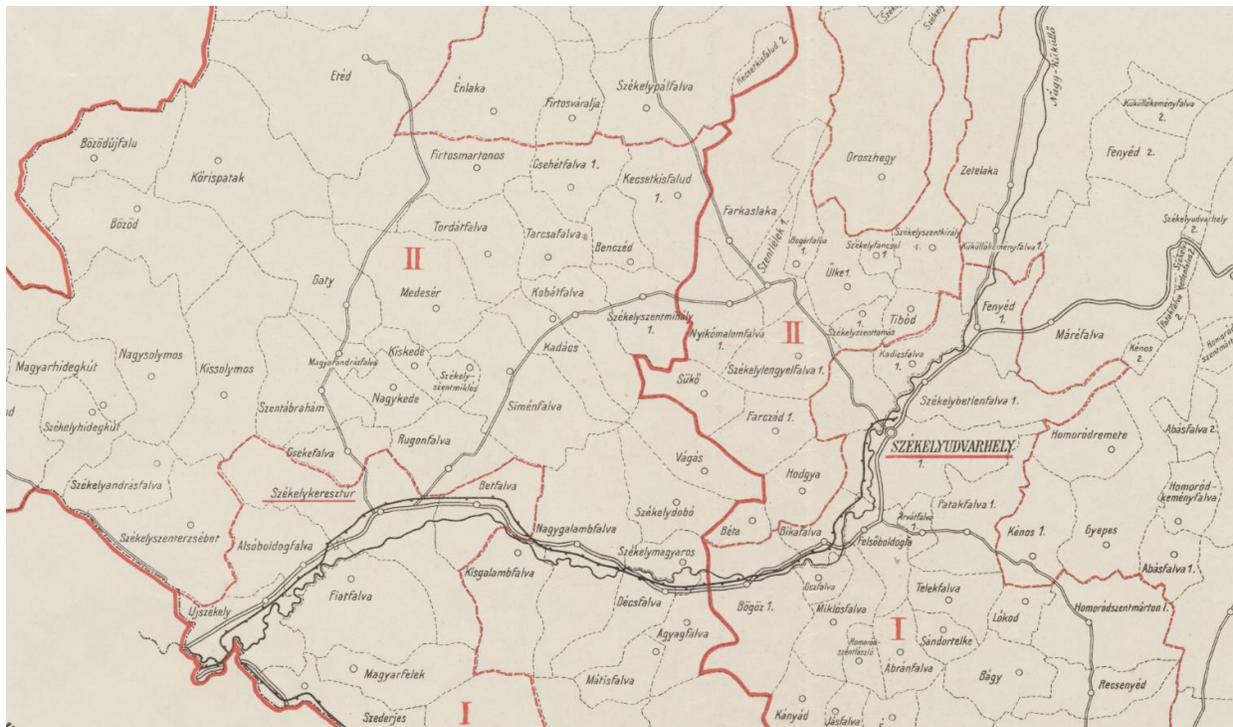


Figure 18. General cadastral map of Udvarhely County from 1912, illustrating the settlement boundaries at scale 1:144,000, serving as a basis for our hGIS maps

## References (cited and processed):

### *Processed sources*

MNL OL A 39. Magyar Kancelláriai Levéltár, Általános iratok, Acta Generalia 3688/1786., / Con-  
scription in 1785–1786

*Az első magyarországi népszámlálás, 1784–1787* (1960). Budapest: KSH.

*II. József népszámlálásának községi adatai* (1996). KSH Népegyetemes Kutató Intézetének Tör-  
téneti Demográfiai Füzetek 15. Eds., D. Dányi, T. Faragó and G. László. Budapest: KSH NKI.

*Pótlás az első magyarországi népszámláláshoz 1786–87* (1975). Történeti statisztikai tanulmányok 2.  
Budapest: KSH, 1975.

Fónagy Zoltán (2013). *A nemesi birtokviszonyok az úrbérrendezés korában. Adattár I–II*. MTA TTI,  
Bp.

Gyémánt, L., R. Câmpeanu, A. Dörner, F. Mureşan, A. Gyémánt (2009–2016). *Conscripția fiscală a  
Transilvaniei din anul 1750. I–II*. Bucureşti

*Lexicon locorum Regni Hungariae populosorum anno 1773 officiose confectum* (1920). Ed. J. Illés.  
Budapest: Magyar békeküldöttség.

### *Literature*

Rózsa, S. (2018). Az első kataszteri felmérés környezettörténeti forrásértéke In: "*Politika, életrajz, di-  
vat, oktatás...*" : *Tanulmányok Magyarország történetéből a középkortól napjainkig*. Eger: Eszterházy  
Károly Egyetem Líceum Kiadó, 129-152.

Szántay, A. (2014a). Serfdom in 18th Century Hungary. In: S. Cavaciocchi (ed.), *Serfdom and Slavery  
in the European Economy, 11th – 18th Centuries*. Atti della "Quarantacinquesima Settimana di Studi"  
14-18 aprile 2013. Firenze: Firenze Univ. Press, 263-281.

Szántay, A. (2014b). Magyarország felmérése és leírása II. József korában. *Catastrum* 1 (3): 2-18.

Szántay, A. (2015). Rural Commons in eighteenth century Hungary. *Jahrbuch für Geschichte des länd-  
lichen Räumes* 12: 91-102.