Mátyás Magyari[*]

Systematizing written records for the creation of a spatiotemporal database concerning the all-time settlement network of Transylvania

Summary: Modern-day Transylvania has always been a diverse and multilingual territory, therefore the localities in this part of today's Romania, appearing in the written records starting from the end of the 9th century, have possessed numerous name variants throughout history. There are historical gazetteers available that compile the written mentions of certain settlements in this area, and consequently allow keeping track of the existence and name shifts – sometimes along with changes in the legal status and administrative affiliation – of the localities, these, however, are not spatial databases, but textual enumerations. In addition, none of them covers the present settlement network of Transylvania (ca. 5000 localities) entirely, let alone the currently non-existent settlements.

Taking this into consideration, this research aims to systematize the information present in these gazetteers in form of a spatiotemporal database, that can be processed with the help of GIS software and hence serve as a background material for the long-term objective of this project: a web map enabling the visual representation of particular changes in the settlement network of modern-day Transylvania, with special regard to the different name variants of the localities. This paper focuses on setting up the core database of this material, through identifying the settlements, noting their general characteristics, and determining their geographical position with the help of historical cartographic sources among others.

The study area

The term Transylvania on its own, may refer to areas of different sizes simultaneously, since the extent of this region has constantly varied over time. Throughout history, Transylvania has belonged to both the Hungarian and the Romanian state, as well as the Habsburg Empire, and has even been a basically sovereign principality for circa 120 years (Bereznay 2011: 98, 134, Köpeczi 1986: 5, 876, Hajdú-Moharos 1997: 6). Different concepts exist to help distinguish the extent of the territory in the most important moments of history.

In the Middle Ages, Transylvania has been a province of the Kingdom of Hungary, led by a voivode. The area under his administration is nowadays referred to as *historical Transylvania*. Geographically, this area is more or less the same as the Transylvanian Basin (Kristó 2003: 114-115, Roth 1999: 7).

The independent Principality of Transylvania (1570–1690), however, did not exclusively consist of historical Transylvania, but also covered some territories to the west of the former province. The term *Partium* was created to mark the territories outside of historical Transylvania, but under Transylvanian administration. This term remained in use with unchanged meaning even after Transylvania lost its independence, up until the second half of the 19th century. The extent of Partium has regularly changed over time, which contributed significantly to the constant transformation of the borders of Transylvania (Bartos-Elekes 2020: 60).

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[*] PhD student, ELTE Eötvös Loránd University, Budapest, Hungary, [matyasmagyari47@gmail.com]

As a consequence of the First World War, historical Transylvania, along with the historical regions of Banat, Crișana and Maramureș, has been integrated into Romania (see Figure 1). Significant parts of the latter territories belonged for at least some time to Partium throughout history. Accordingly, the term Partium has reappeared in today's Hungarian colloquial usage, referring to the combined territory of Crișana and Maramureș regions. The modern Partium is separated from Banat by the Mureș (Maros) river (Vofkori 1996: 10-11, 17, 31).

The four historical regions that became part of Romania after the First World War, constitute *modern-day Transylvania* (Vofkori 1996: 10) and form the target area of the present research. In the text, the term Transylvania is used as a synonym of modern-day Transylvania.

Figure 1: Historical and modern-day Transylvania

Background

There are many publications available today that focus in some respect on the settlements of Transylvania. These include gazetteers containing the localities of the region, some of them compiling the written mentions of the settlements, which might help researchers reconstruct the settlement network of the territory in particular periods of history. This process is, however, very time consuming, since these materials are practically textual enumerations. Besides that, most of the gazetteers concentrate either on a specific period of time, or on particular regions or administrative units of Transylvania and none of them covers the present settlement network of the territory entirely, let alone the currently non-existent settlements. Because of these, seeing the

settlement network of Transylvania as a whole and following its temporal changes is an extremely complex task.

The necessity for an easy-to-use, yet reliable work, which is able to serve as a source material for research on Transylvanian settlement network and its history is therefore evident. One of the most important aspects of such a material would be the dynamic visualization of the evolution of the settlement network, which has so far been omitted from the publications, partly because of the limited possibilities. This research attempts to create a spatiotemporal database of the Transylvanian localities by systematizing the content of the gazetteers and other scientific materials that compile the written records of the settlements, possibly providing the background for such a visual material. In addition to this, the database itself could be an easily accessible way of communicating data on localities.

Source materials

The most important material used during the creation of this dataset is the work of Szabó (2003), which compiles the written mentions of a number of settlements (ca. 5800), including currently non-existent ones, from all over Transylvania, covering the period from the very first records (end of 9th century) to the present day, with an exemplary level of detail. Nevertheless, this work also needs to be complemented in some cases. A notable material used for this purpose is the gazetteer of Varga (2007), presenting the current settlement network of Transylvania almost entirely, but only concerning the written records of the last two centuries. Works that are helpful in identifying data on medieval settlements that do not exist anymore, include the books of Csánki (1890–1913) and Györffy (1987–1998), these, however, discuss only certain parts of Transylvania. There are also some useful materials, linked for example to Jakó (1940) or Pesty (1877, 1882), whose target area is only regional.

The database

The works listed above contain a vast amount of information on the settlements of Transylvania. This needed to be filtered and organized into a database that can be processed geoinformatically and at the same time is able to serve as a concise and easily interpretable format of communicating the data.

	id	NEV_ELP_X	NEV_HU_X	NEV_RO_X ▲	TIPUS_X	KOZIG_X	ELSO_EML	UTOLSO_EML	FORRAS_A	FORRAS_B	FORRAS_LOK
6476	63759	*NULL*	Kézdivásárhely	Târgu Secuiesc	MJV	Kovászna megye	1407	*NULL*	Szabó	*NULL*	*NULL*
6477	63759A	Kanta	Kézdivásárhely	Târgu Secuiesc	B	Kovászna megye	1502	1849	Szabó	*NULL*	2KAT
6478	63759B	Kézdioroszfalu	Kézdivásárhely	Târgu Secuiesc	B	Kovászna megye	1567	1956	Szabó	*NULL*	2KAT
6479	28521	*NULL*	Asszonyvására	Târgușor	F	Bihar megye	1203	*NULL*	Szabó	*NULL*	*NULL*
6480	59577	*NULL*	Kékesvásárhely	Târgușor	F	Kolozs megye	1326	*NULL*	Szabó	*NULL*	*NULL*
6481	22772	*NULL*	Tarhavaspataka	Târhăuși	F	Bákó megye	1956	*NULL*	Szabó	*NULL*	*NULL*
6482	29494C	Panasz	Köröstarján	Târian	B	Bihar megye	1214	1599	Jakó	*NULL*	2KAT
6483	29494A	Györk	Köröstarján	Târian	NB	Bihar megye	1220	1294	Györffy	*NULL*	Györffy
6484	29494B	Mindszent	Köröstarján	Târian	B	Bihar megye	1332	1337	Györffy	*NULL*	2KAT
6485	29494	*NULL*	Köröstarján	Târian	F	Bihar megye	1341	*NULL*	Szabó	*NULL*	*NULL*
6486	29494D	Tóttelek	Köröstarján	Târian	NB	Bihar megye	1465	1516	Jakó	*NULL*	Jakó
6487	6912	*NULL*	Țarina	Țarina	F	Fehér megye	1956	*NULL*	Varga	*NULL*	*NULL*
6488	35161	*NULL*	Felsőilosva	Târlișua	F	Beszterce-Nasz...	1334	*NULL*	Szabó	*NULL*	*NULL*
6489	42012	*NULL*	Tatrang	Târlungeni	F	Brassó megye	1367	*NULL*	Szabó	*NULL*	*NULL*

Figure 2: Detail of the database

In its present form, the database contains almost 7500 localities, their attributes being stored in several different fields (see Figure 2). As of now, only the general characteristics of the settlements have been processed. These are discussed below according to the fields of the database:

- *id – Contains the unique identifier of the settlements.* This field is essential from the point of view of geographic positioning and at the same time geoinformatic processing. The identifier of the present-day localities is the 4-6 digit code assigned to the settlements by the Romanian National Institute of Statistics in the Information System of the Register of Administrative-Territorial Units (SIRUTA code). The identifier of the disappeared settlements has also been derived from this code, by adding a letter to the SIRUTA code of the present-day locality, on the territory of which the disappeared settlement was formerly situated. If there were more than one disappeared localities on the territory of a certain present-day settlement, the letter assigned to their code was selected based on the order of the date of their first written mention.

- *NEV_ELP_X – Contains the name of the disappeared settlements, if required.* The name primarily used in the source materials has been recorded.

- *NEV_HU_X – Contains the Hungarian name of the settlements.* Most of the settlements of Transylvania possess Hungarian names. Although some of these are officially recognized minority names, none of them is in fact official (Bartos-Elekes 2013: 29-30). Accordingly, the Hungarian name primarily used in the source materials (mainly in the works of Szabó and Varga) has been recorded. If there was no Hungarian name specified in any of the works, only the Romanian name has been recorded. In the case of the disappeared localities, the Hungarian name refers to the currently existing locality, on the territory of which they were once situated.

- *NEV_RO_X – Contains the official Romanian name of the settlements.* These have been documented based on the latest available update of the aforementioned Information System of the Register of Administrative-Territorial Units (SIRUTA) of the country, from 2021. The use of this register also ensured the inclusion of every present-day locality in the database. In the case of the disappeared localities, the Romanian name also refers to the currently existing locality, on the territory of which they were once situated.

- *TIPUS_X – Contains the current legal status of the settlements.* In this respect, the present-day localities have been classified into three categories: cities (*MJV*), towns (*V*) and villages[1] (*F*). In the case of the disappeared localities, this field specifies whether the location of the settlement is precisely (*B*) or only approximately (*NB*) known. The position of a settlement was declared to be precisely known, if it was indicated by at least one toponym on the cartographic materials examined.

- *KOZIG_X – Contains the current administrative affiliation of the settlements.* The name of the administrative divisions has currently been indicated only in Hungarian. Disappeared settlements have adopted the administrative affiliation of the present-day locality, on the territory of which they were once situated.

- *ELSO_EML – Contains the year of the first written mention of the settlements.*

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[1] In Romania, one or more villages form a commune, which is the lowest level of administrative unit in the country. This means that villages are not independent localities in administrative and statistical terms. One of the villages of the commune serves as the commune centre, where the seat of public administration authorities is situated. In a later stage of the research, commune centres will also form a separate category in the database.

– UTOLSO_EML – Contains the year of the last written mention of the settlements, if required.
– FORRAS_A, FORRAS_B – Contain the source(s) providing the attributes of the settlements.
– FORRAS_LOK – Contains the source used to determine the geographic location of the disappeared settlements, if required. These materials could have been both textual and cartographic works.

Geoinformatic processing

Through using the SIRUTA code as a unique identifier, the geographic positioning of the present-day localities has become semi-automatic, as the information present in the database could be linked to free-to-use point geometry vector files available on the internet (Balint and Crăciunescu 2020), containing both the geographic coordinates and the SIRUTA code of the settlements of today's Romania.

In contrast, the geographic location of the disappeared settlements had to be determined manually. For this purpose, indications of the textual source materials, the digital map of Engel (2020) about the settlements of medieval Hungary, as well as old cartographic works have been used. The latter included the maps of the three military surveys of the Habsburg Empire (1763–1787, 1806–1869, 1869–1887), the maps of the military survey of Hungary from 1941, or the Gauss-Krüger projection topographic maps of Romania. Most of these are available for browsing on interactive websites, such as Arcanum Maps (https://maps.arcanum.com/en/), but some of them were published as georeferenced raster files, for example on digital storage devices and hence could be directly used in GIS-software (see Figure 3).
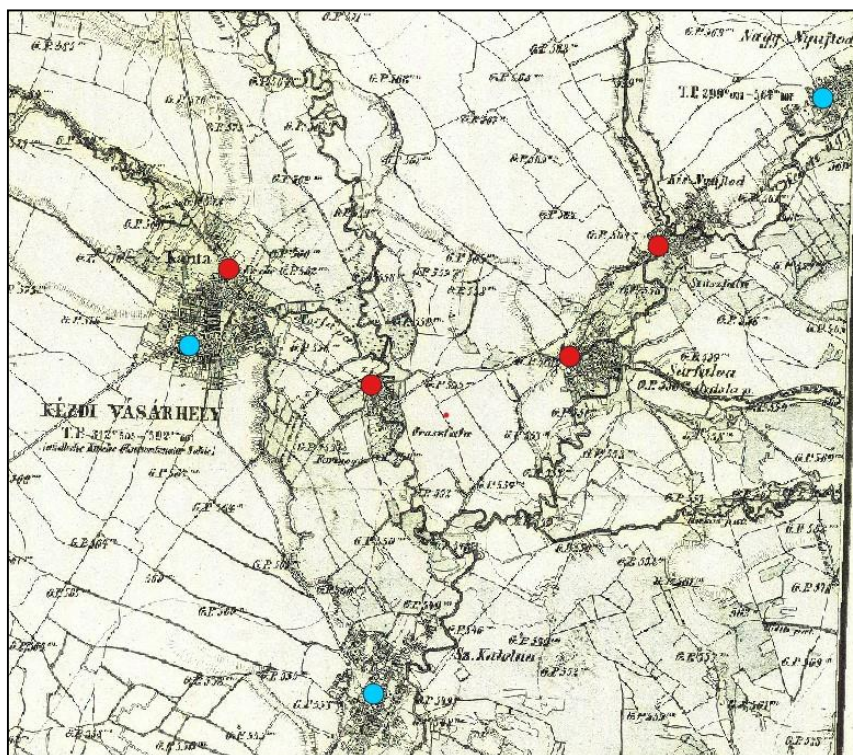

Figure 3: Detail of a map of the second military survey of the Habsburg Empire depicting both the currently existent (blue dots) and non-existent (red dots) settlements in the vicinity of Kézdivásárhely (Târgu Secuiesc)

During the positioning of the disappeared localities, the only data stored was the unique identifier of the settlements, which has later been used to connect the database with the vector file containing the geographic coordinates of the localities.

Analysis of the dataset

The database provides a comprehensive picture of the current settlement network of Transylvania, consisting of 5331 localities. Among these there are 48 cities, 95 towns and 5188 rural settlements. The localities are situated in 20 different counties of Romania. The settlement network of 16 counties is basically covered in its entirety, while the other 4 administrative divisions include only a few localities that fall within the study area (see Table 1).

County	Number of settlements
Alba (Fehér)	716
Arad (Arad)	283
Bacău (Bákó)	13
Bihor (Bihar)	458
Bistrița-Năsăud (Beszterce-Naszód)	249
Brașov (Brassó)	165
Caraș-Severin (Krassó-Szörény)	309
Cluj (Kolozs)	434
Covasna (Kovászna)	128
Harghita (Hargita)	264
Hunedoara (Hunyad)	487
Maramureș (Máramaros)	247
Mehedinți (Mehedinți)	6
Mureș (Maros)	518
Neamț (Neamț)	10
Sălaj (Szilágy)	289
Satu Mare (Szatmár)	234
Sibiu (Szeben)	188
Suceava (Szucsáva)	8
Timiș (Temes)	325
Σ	**5331**

Table 1: The number of currently existent settlements of Transylvania in the present-day administrative divisions of Romania

The dataset contains exactly 7464 different localities. This means, that during the creation of the database, 2133 dissapeared settlements have been identified, of which the geographic position of 678 could be determined accurately, while the location of the other 1455 is only approximately known.

Overall, the first settlement of Transylvania to appear in the written records is the village of Biharia (Bihar) in today's Bihor County, which was mentioned in the documents as early as 896. The first written mention of the city of Alba Iulia (Gyulafehérvár) also dates back very early, to the year 900. The latest locality to become independent is the village of Sâlța in Maramureș County, being formed in 2006. The first written record of most of the settlements of Transylvania comes from the Middle

Ages, mainly from the 14th and 15th centuries. However, as a result of the administrative reforms of the communist era, a number of localities were founded in the 20th century as well (see Table 2).

Century	Number of settlements
9th	2
10th	5
11th	26
12th	68
13th	991
14th	1714
15th	1605
16th	820
17th	132
18th	292
19th	206
20th	1602
21st	1
Σ	**7464**

Table 2: The number of settlements in Transylvania classified by the century of their first written mention

By adding up the number of localities recorded in the documents until the end of a certain century and substracting the number of disappeared settlements last mentioned before the beginning of the same century, it is possible to specify the number of settlements that were documented to exist in Transylvania during the given century (see Table 3). Obviously, the further away we get from the present day, the less likely it is that written records of the period have survived, and the further from reality this estimation is.

Century	Number of settlements
9th	2
10th	7
11th	33
12th	101
13th	1092
14th	2779
15th	4215
16th	4430
17th	4260
18th	4408
19th	4519
20th	6014
21st	5331

Table 3: The number of settlements documented to exist in Transylvania during in each century

The database opens up the possibility of many more such queries, for instance it can be used to find out which settlements existed in Transylvania in a particular year of history according to written

records. By including the source of the data for each locality, the database also provides the opportunity for more in-depth research. The geoinformatic processing of the database made the visual representation of the findings of such examinations possible as well. This will be illustrated in the following, through three figures representing the lower valley of the river Arieș (Aranyos), in the surroundings of Turda (Torda), Cluj (Kolozs) County.

Figure 4 depicts every settlement documented to exist in the specified territory throughout history. The localities are classified according to the date of their first written mention. The settlements marked in bold still exist, while the others have disappeared or lost their independence. The settlement names indicated are the ones recorded in the database.

The first locality of the area to be mentioned in written sources is the city of Turda (Torda), the most important settlement of the territory. Its first written record dates back to as early as the 11th century. Most of the localities have already appeared in the documents during the Middle Ages, which is in accordance with the information provided in Table 2. In fact, there are only a few settlements that were formed just recently, the core of the current settlement network had already been established by the end of the 15th century. A significant number of disappeared localities existed in the area over time, as well. Figure 5 distinguishes between disappeared settlements of accurately and inaccurately known geographic location. These occur in roughly equal proportions in the territory.
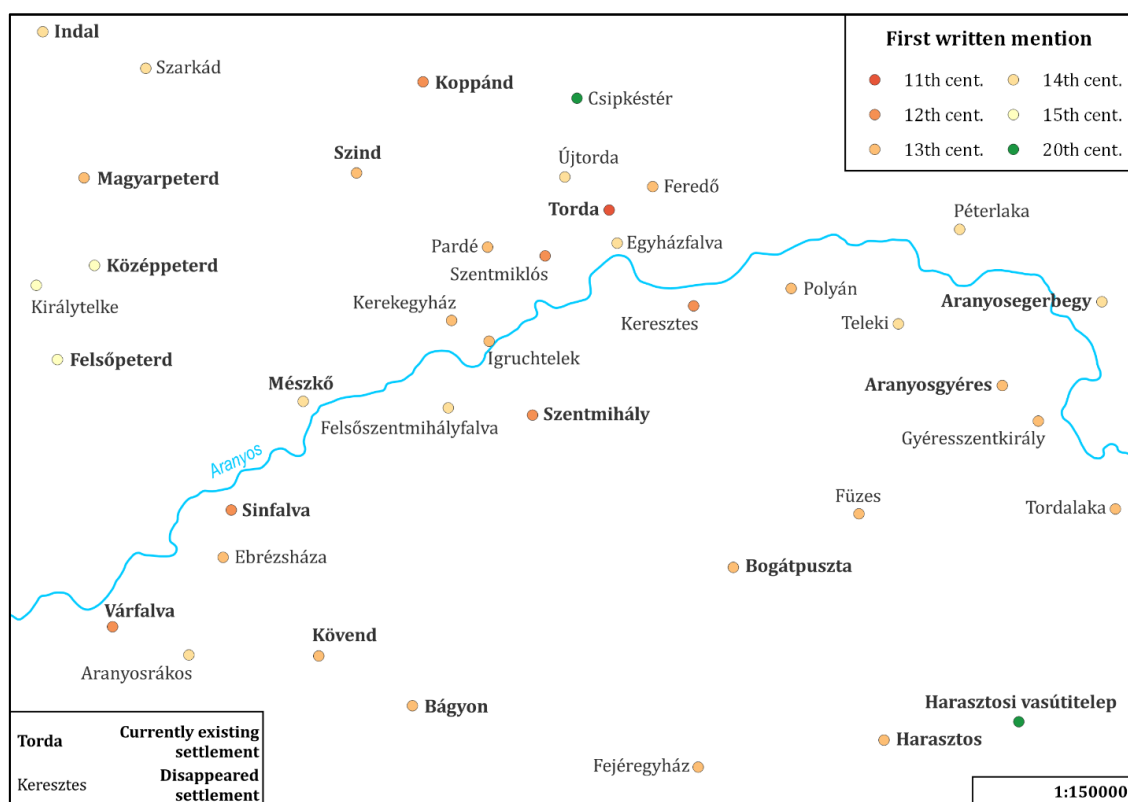

Figure 4: Settlements documented to exist in the lower valley of the river Arieș (Aranyos) throughout history, classified by the year of their first written mention

Figure 6 shows the differences in the settlement network of the territory in the 14th and 15th centuries, by representing the localities documented to exist during these particular centuries, using the method explained at Table 3. The figure highlights both the settlement names typically used in the

written sources of the respective century and the ones registered in the database, and thus provides the opportunity of inspecting the evolution of documented settlement names as well.

The majority of the localities have been documented to exist throughout both examined centuries, some changes, however, can be observed. The first written mention of two present-day settlements – Petreștii de Mijloc (Középpeterd) and Petreștii de Sus (Felsőpeterd) – comes only from the 15th century, which means that there is no evidence of their earlier existence. This also applies to a locality documented as *Kyralthelke,* which has disappeared to the present day. In contrast, many settlements that no longer exist, appeared in written records for the last time in the 14th century. These include the ones documented as *Igrechi, Feligaz, Fyuzeg, Kerekygház, Obruthusa* and *Pordoy.*

In case of some localities, changes can also be noticed in the name typically used in the written records of the different centuries. While in the 14th century Câmpia Turzii (Aranyosgyéres) is mostly referred to as *Gerestelke,* in the 15th century is usually mentioned as *Geres.* In the 14th century, the village of Mihai Viteazu (Szentmihály) is typically documented as *Zentmihalfalwa,* but in the 15th century, the variant *Alsozenthmyhalfalwa* (lit. *Lower Zenthmyhalfalwa*) starts to become more frequent, in order to differentiate the locality from the neighbouring *Felsewzenthmyhalfalwa* (lit. *Upper Zenthmyhalfalwa*). The two settlements have since merged.
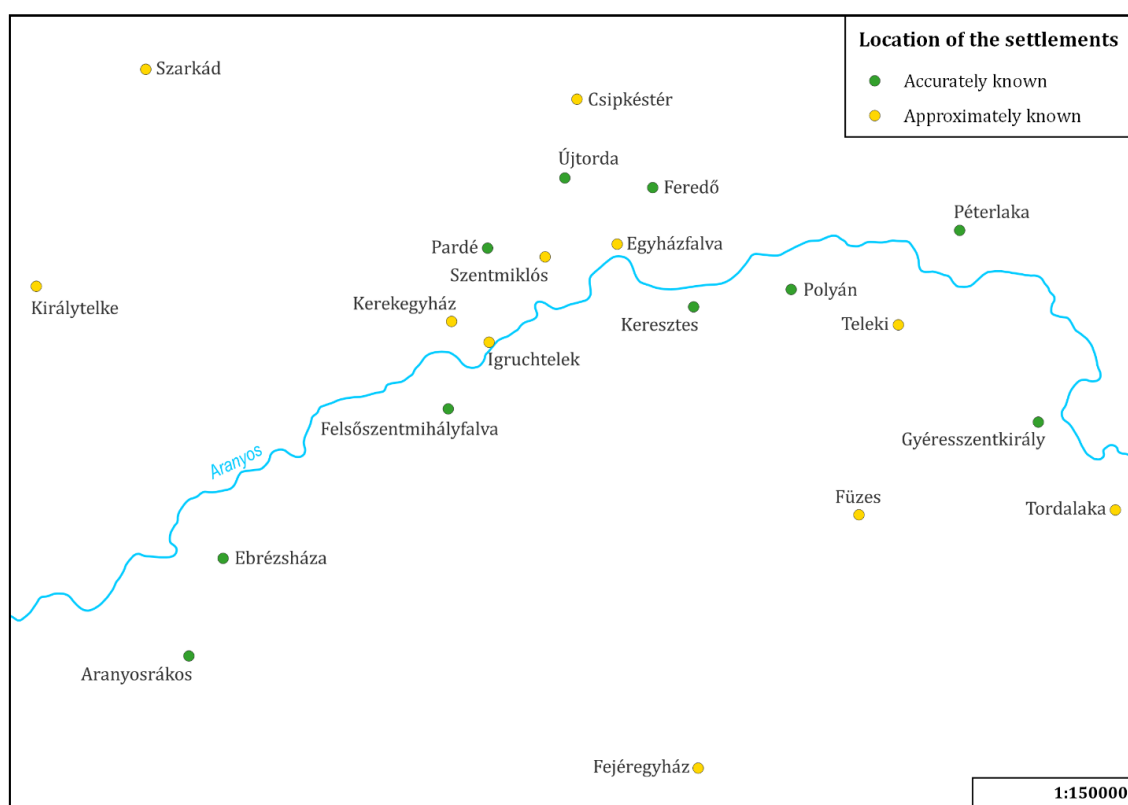

Figure 5: Disappeared settlements documented to exist in the lower valley of the river Arieș (Aranyos) throughout history

Although in this way there is already an opportunity to produce such static cartographic representations, the long-term objective of this project is the dynamic visualization of particular changes in the settlement network of Transylvania, by the development of an interactive web map.

Figure 6: Settlements documented to exist in the lower valley of the river Arieș (Aranyos) in the 14th and 15th centuries

Continuation of the research

The main aim of the research is the creation of a visual material that will facilitate the determination of which settlements existed in Transylvania at a given moment of history, what their legal status

was at that time, to which administrative division they belonged, and especially what kind of name did the contemporary documents use to identify them. Consequently, the core database needs to be complemented with information regarding the changes in the legal status and administrative affiliation of the settlements, as well as the name variants of the localities in different languages, appearing in written sources throughout history.

After the completion of the database, a dynamic and interactive web map illustrating the transformation of the Transylvanian settlement network is bound to be developed most probably with the help of the open-source JavaScript library Leaflet. Attempts have already been made to test certain features of such a service. Although far from meeting every expectation of the research, a functional web map, able to represent the changes in the settlement network of a part of Transylvania, the historical Székely Land, has already been created (Magyari 2022).

This material is already able to display the settlements that existed in the study area in a particular year of history, as well as the legal status they beared and the most common Hungarian name used in records of the period for referring to them (see Figure 7). This will be transformed and upgraded until it covers the whole territory of Transylvania and fully satisfies the demands of the present project.
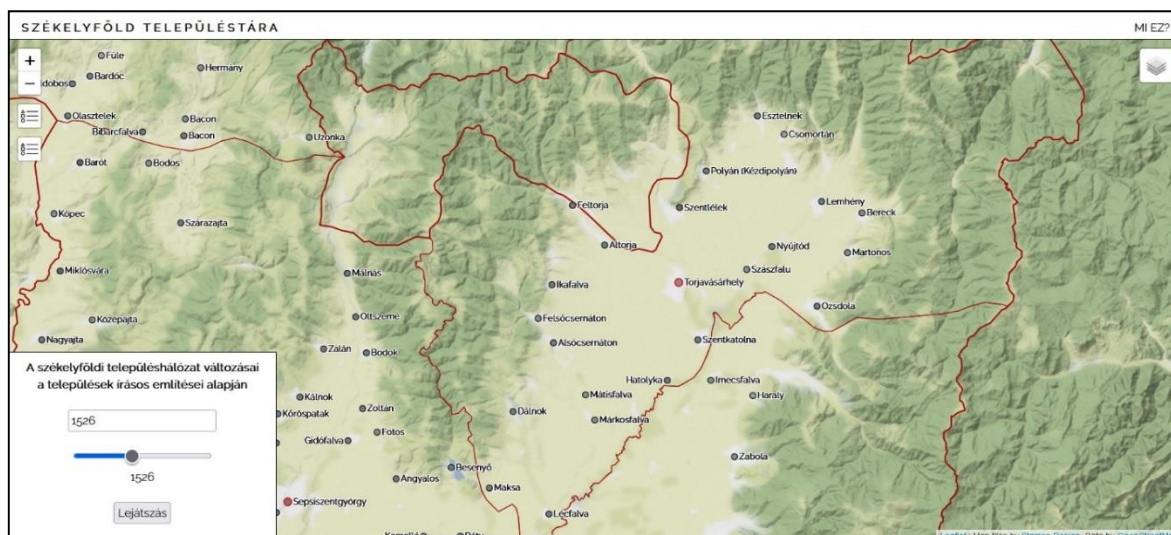

Figure 7: Detail of the yet unpublished, upgraded version of the web map created by the author, representing the settlements proven by written records to have existed in 1526 in the surroundings of Kézdivásárhely (Târgu Secuiesc)

Conclusion

During the current stage of the research, a database containing the general characteristics of around 7500 settlements that existed on the territory of modern-day Transylvania throughout history has been created. In the following phases, this will be complemented with other details relevant from the point of view of the representation of particular temporal changes in the settlement network of the study area. The evolution of the settlement network is intended to be visualized through the creation of a web map. As both the database and the web map are developed using information available in the written records of the settlements, they are expected to serve in the future as a user-friendly, yet reliable source material for research concerning the Transylvanian settlements and their history.

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