

## UTILIZATION OF THE INUNDATION AREA OF LAKE FERTŐ BEFORE REGULATION WORKS: EXAMPLE OF SARRÓD AND ITS SURROUNDINGS

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### Abstract

Due to its extreme shallowness, the basin of Lake Fertő/Neusiedl was exploited well before the regulation works which took place especially from the second half of the 19th century. Before regulation works, utilization of the primary lake basin and the secondary basin or inundation area was mainly dependent on the actual waterlevels. Located at the shallow, southeastern edge of the lake, probably the most typical sample area of temporal inundation sites is the one which belongs to the village of Sarród. Based on contemporary (partly late medieval, but mainly early modern, modern) written sources, maps as well as archaeological evidence, in the present study an attempt is made to provide some forms of a simple reconstruction on the utilization of the lake basin. While the basic utilization types depended on the actual waterlevel conditions, due to historical, economic reasons and perhaps climatic variabilities and change, other utilization variants as well appeared in time. The available contemporary information can be divided into three major groups related to the low-very low, medium-high waterlevels of the lake. The third group of evidence is connected to the special utilization types of islands located in the basin. Applying a simplified utilization 'model' related to the coastal wetlands of Western Europe, the analysis and results of the present study can be used as an example for source analysis in the whole Fertő area as well as other wetlands connected to lakes.

Keywords: historical land use, inundation area, waterlevel changes

### At the edge in between: lake and wetland environment

Before the late 19th-century regulation works, the landscape and land use of the area were fundamentally different than today. Not only the landscape but also the hydrological regime of the alkaline Lake Fertő/Neusiedl and the connected wetlands of the Hanság/Waasen looked basically different: they all took part of a larger hydrological system of such main rivers of Northwestern Hungary as the Répce, Rába and Rábca, and through the last one the lake, but especially the wetlands had indirect connection to the Danube. Apart from the indirect supply coming from the mentioned rivers through the former wetlands of the Hanság, the extremely shallow Lake Fertő had direct water income from the Ikva river, too. At the southern edge of the lake basin, an extensive area belongs to the inundation area which in fact is still part of the lake basin. This inundation area reaches its greatest extent at the southeastern edge, at the village of Sarród, where it comprises a transition towards the wetland areas of the Hanság. Similar to the area of the neighbouring settlements of our investigation, the village boundaries, far extended into the basin, reflect a typical edge-of-an-inundation-area location: as such, most of its lands are located in the inundation area or secondary (and partly also in the primary) basin of the lake (MAKSAY, 1974). Depending on the actual waterlevel of the lake, this inundation area looks different: while in case of high waterlevel it is partly flooded, in case of low waterlevel of the lake it is a pasture with some brooks and deeper bogs and mires around.

The present study area belongs to a village of medieval origin; unlike today, before the 20th century most of its lands located in the secondary basin of the lake (hereafter called 'inundation area'), while its eastern boundaries were already in the direct neighbourhood of the extended wetlands of the Hanság. Due to the afore-mentioned environmental conditions, one can recognise a double land use of the study area: economy and income of the village lied upon different bases in case of different waterlevels. Today most of the area belongs to the Fertő-Hanság National Park. The National Park takes the responsibility of habitat reconstructions and the creation of 'quasi-natural' sites where they try to establish an ecologically balanced system. In order to make this work the most effective, they need an adequate background of how the area 'traditionally' looked like in the last hundreds of years. As we will see later, the best and largest material to this work comes from the time immediately before water regulation works started, namely from the 18th century.

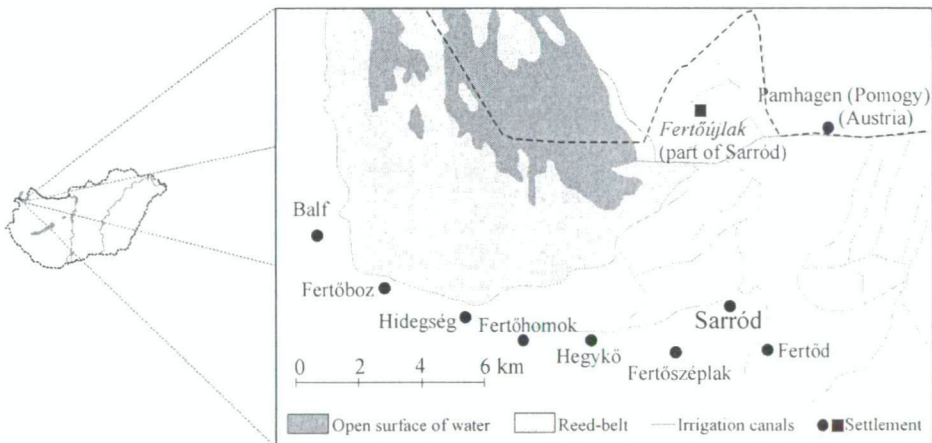


Figure 1. Settlements of the southern Fertő area

### Past waterlevels – is there a possibility for any reliable reconstruction?

The past landscape as well as the land use of the secondary basin together with its changes could be influenced and altered by human activity, but also natural environmental changes such as the actual waterlevel of Lake Fertő had primary importance. This waterlevel, nevertheless, varied not only for some days or weeks due to prevailing northern or southern wind directions, but it also had significant seasonal and longer-term changes (KOPF, 1963; BÁRDOSI, 1994; KALMÁR, 1982). From the late 16th, but especially from the 17th century there is more and more information available (descriptions, legal documents, perambulations, etc) to the reconstruction of possible waterlevels of the lake.

As we could already see, from the viewpoint of reconstruction possibilities the most significant period is the 18th century. This is the time when the lake has not yet been regulated but already enough documents (e.g. detailed maps, diaries, scientific descriptions – among the most interesting and detailed ones, see for example KIS, 1797,

1816) can be found to follow the most significant changes. Official documents (for a good example, see the collection in ALB) and then the measurement of the waterlevel became relevant only in the 19th century, but reliable results of systematical observations are available only for the 20th century (KOPF, 1963, 1974; ZORKÓCZY, 1975; KALMÁR, 1982).

At present, only one "official" reconstruction of the Austrian hydrologist, Fritz Kopf (KOPF, 1963) is available on the typical waterlevels and the changes of the last approximately four hundred years (Fig. 2.). Although this reconstruction is widely used and accepted in Hungary, there are some questionable points concerning its database; this fact warns us to apply the graph with caution.

Therefore, un connection with the reconstruction of Fritz Kopf, we have to rise attention to some uncertainties: the author did not give any information concerning the source material of his reconstruction, or – if it is not his database – then who made the reconstruction itself. Thus, it is not really possible to decide on the reliability and contemporaneity of his sources. Another problem is the fact that in his graph he uses continuous line to present the historical waterlevel changes (see Fig. 2.), while on the basis of our present knowledge referring to the source material of the region, it is not really possible to show the whole course (even if decadal) of waterlevel changes in such a detailed way.

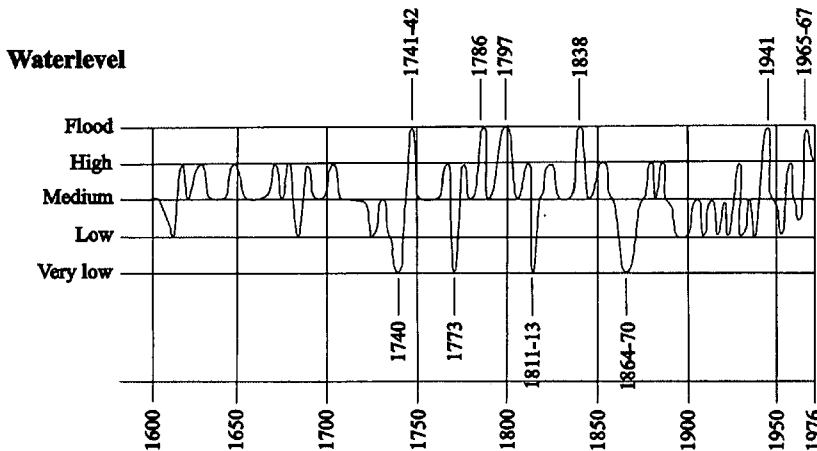


Figure 2. The waterlevel changes of Lake Fertő in the last four hundred years, reconstructed by Fritz Kopf (KOPF, 1963; 20th-century update: ZORKÓCZY, 1975)

As a consequence, he either applied significantly more contemporary original sources than what we know up to now, or he simply connected the known waterlevels, and in this way 'created' a continuous line of reconstruction. While in many cases it was possible to find original contemporary sources to his graph, there are some cases when the connection between the presumable original source is not that clear or it is not yet possible to find the contemporary evidence.

Based on the above-mentioned reasons, I do not apply the graph of Fritz Kopf as a direct source of information concerning past waterlevels of the lake.

Being the only available reconstruction on the waterlevel changes of the lake at the moment, it is still important because in the long run it clearly represents the great variability and frequent changes of the waterlevel as well as the tendencies of these changes in the last four hundred years.

### Shoreline changes and the inundation area

Due to the shallowness of the lake (today the average depth is 0.5-0.7 m) and the smoothness of the lake basin, little changes in hydrology can cause significant losses of extension. This means in practice that 1 cm change in waterlevel means approximately 3 km<sup>2</sup> change in water surface (PANNONHALMI, 1997). Although conditions were partly different before regulation works, the main characteristics, for example the extreme shallowness and the flatness of lake basin did not change fundamentally (see, e. g. KOPF, 1967).

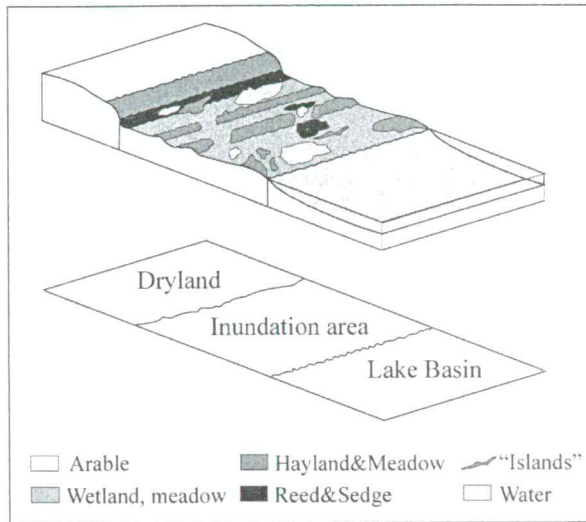
The repeated changes of salt content, caused by the waterlevel changes in great dry periods of the lake, can be clearly followed in the sediments (today dry) parts of the lake basin (the secondary lake basin or inundation area of the lake), for example near the village of Sarród (Lászlómajor – see e. g. the analysis of SZABOLCS – ÁBRAHÁM, 1957). After the lake has left the inundation area in the neighbourhood of the village of Sarród the "soil," according to the survey carried out at the turn of the last (19th and 20th) century, was "of medium quality" (SZONTAGH, 1903: map in the appendix).

The inundation area, in case of medium or high waterlevel, could be a wet or even swampy plain, while in case of low waterlevel it was a pasture, meadow for mowing or both, in some places interrupted by bogs, mires or small lakes as well as waterflows (Fig. 3.). According to the '*Conscriptio*' of Sarród village in 1727-8, the extension of the "*Pascua*" (pasture) was 3.5 times larger in case of dry conditions compared to the situation in wet periods (CR 1727-8/Sarród). From the 16th century on, the meadows and pastures of the area were used in grazing cattle and horse (for medieval and later evidence, see KISS, 2001; modern evidence: e.g. TÓTH, 1998; ÉLŐ, 1937. etc; see later the 17-18th-century unpublished reambulation material).

While a valuable model of the utilization of the inundation areas along the Tisza river and the lowlands of northeastern Hungary was made by Sándor Frisnyák (concluded in FRISNYÁK, 1995), this – as a compact model – works on the lake inundation area only with certain restrictions. Moreover, differences in forms of utilization and intensity in time can be detected as well. In certain aspects, medieval utilization of actual land pieces at the Lake could be more intensive than in later periods. In order to represent these differences in an easily understandable way, I also counted with the parallels of see-shore areas in Western-Northwestern Europe. Consequently, as the basis of a simplified representation of lake-(secondary)basin utilization, a series of drawings – similar to the ones found in the book of Stephan Rippon referring to the Dutch and British shorelines – were applied here (see RIPPON, 2000).

The aim of application of this simplified 'model' is to provide an example of (secondary) lake basin utilization, which can later be a basis for further representation. This is especially valid and an interesting task for the early period (up to the late 18th

century) when no adequate maps are yet available, on the other hand we have some detailed descriptions on the land use of (certain pieces of) the inundation area. Since the inundation area belonging to the village of Sarród is located at the edge of the wetlands of the Hanság and Lake Fertő, the 'model' can be extended to other "hany" (mixed wetland) type of inundation areas of lakes.



**Figure 3.** Simplified picture of land use at the southeastern shoreline in the modern times

### Utilization of the lake basin before water regulation works

The utilization of waters, fishery and the fishing industry itself can be divided into two larger groups: on one hand the fishery of the Lake and that of the inundation area. Moreover, the utilization of the vegetation (reed, sedge, bulrush) also provided an additional income for the inhabitants. While there is more information available about the fishery of the lake at this particular place, we know relatively little about the actual fishery of the inundation area. Nevertheless, on the basis of close parallels (the almost neighbouring villages of Fertőhomok and Hidegség), we have to count with some similar utilization of not only the lake but also that of the inundation area, already in the Middle Ages (see e. g. 1281: LINDECK-POZZA et al, 1985).

However, taking morphological conditions into account, the sentence of Márta Belényesy – referring to the conditions of the 14th-century Hungarian fishery – can be true also for our research area, namely that "The water remaining in the deeper hollows were excellent places for creating fishponds" (BELÉNYESY, 1953). Although we do not have such a direct information concerning fishponds in the inundation area, a somewhat indirect source is available referring to the fishponds of a local landowner in Fertő, in 1575 (SOÓS, 1937). Another indirect example is when, in the middle of the 16th century, the powerful landlords of the area, the Nádasdy family transported baby fishes from Fertő to their (artificially created) fishponds (e.g. HERMAN, 1887; 1533: SZAMOTA – ZOLNAY, 1906). The actual extension, 'quality' and utilization of the vegetation in the

litoral area also primarily depend on the waterlevel: changes of this "reed-sedge" belt can mainly be detected in the 18th-century sources (see e.g. CR, CL references and maps).

In addition, the ford between the villages of Pomogy/Pamhagen and Sarród (also dividing the basins of Lake Fertő and Hanság) had special importance in fishing industry, documented from the 14th century (see e.g. 1365, 1558: NAGY, 1889; LUKÁCS, 1953; BÁRDOSI, 1994; KISS, 2001). From the middle of the 16th century (see the abundant correspondence of the Nádasdy family: KÁROLYI – SZALAY, 1882; MÁLYUSZ, 1929), through the late 16th-17th-century economic sources such as conscriptions and *urbaria* (see MIKÓ, 1992; and the UetC reference material) up to the cartographic evidence of the late 18th-early 19th centuries, the main characteristics of the environment remained the same more or less: depending on dry or wet conditions, one could cross at the ford in water or on foot. The most typical examples of the applied cartographic evidence are the results of 'ford- and shoreline mapping' (e.g. 1782: MOL S12 Div. XVI. No. 8, 10; S 12 Div. XI. 34/2, 5), 'military-mapping' (KF/1-3) as well as 'regulation-mapping' (e.g. MOL S 12 Div. XIII. 295/1) – all connected to medium and high waterlevels of the late 18th century.

#### Utilization of the inundation area at medium and high waterlevels

Concerning utilization of the inundation area, in case of medium and high waterlevels, most of our information is available only from the (16-18th centuries (See e.g. KÁROLYI – SZALAY, 1882; UetC 12:42/3, 4, 6, 56/33-36; MIKÓ, 1992; MOL, P 623/124; referred CR and CL material). The utilization at that time took place from the direction of the villages located outside of the basin, and thus, this utilization (except for, of course, the almost ever-flourishing fishing industry) was concentrated mainly to the litoral region (and the 'islands') (Fig. 4.). Significant changes occurred only with the great drought of the lake basin in 1865-8, followed by the intensive regulation works.

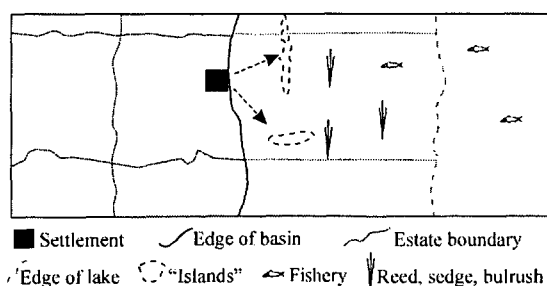


Figure 4. Utilization of the inundation area at medium and high waterlevels

The inundation area – due to the higher waterlevel – is covered partly by shallow but open surface of water, partly by reedy-swampy area and bogs, while some higher parts (the 'islands') still keep acting as places for mowing or grazing animals (mainly oxen). According to the urbarial conscriptions of 1767, the herds of oxen of the village reached the remaining pastures by swimming (TÓTH, 1998).

In case of high and medium waterlevels, fishing also plays a rather important role, while high and very high waterlevels did not support further extension of reed and sedge.

#### Utilization of the inundation area and the primary lake basin at low waterlevels

The basin utilization in case of low and very low waterlevels, represented in Fig. 5., is less homogenous compared to the previous cases. Here the main source of information is the extensive legal material of perambulation and reambulation documents (descriptions and questionnaires on waterlevel changes, current utilization and exact location of boundaries, environmental conditions) and cartographic evidence (early maps and sketches), dated from the late 17th century up to the mid-19th century (e.g. MOL UetC 12:42/3, 4, 6; CL, CR reference material). Interestingly enough, this situation is depicted on very few of the early local, high-quality maps, produced by professional map-makers; due to the contemporary high waterlevel conditions at that time, most of the late 18th-century maps provided information for medium and high waterlevels. Only a little amount, and predominantly lower-quality maps or sketches (of both earlier and later periods) are available, mainly in the legal material (reambulation procedure: MOL P 623/124, P 108/111-2, Processus appellati 5/5211, etc). More information appears only with the already good-quality mid-19th-century catastrother material for the reconstruction of low waterlevel environments (for the late 17th-early 19th-century period, MOL P 623/124, P 108/111-2; cadaster conscriptions: 1855-6: MOL S 79. Sarród, Süttör, etc).

Even if the majority of sources provide an overview on the prevailing conditions of the 17-18th centuries, in some cases medieval examples can be cited as well. According to this set of early evidence, the meadows '*in Ferteu*' were utilized and had a high value already in the (13-)14th century (KISS, 2001): thus, here the importance of grazing has to be emphasised. The area was utilized as pasture, meadow for mowing, whereas also acted as an important set of raw materials (partly or entirely free of taxation!) such as reed (e. g. for covering house, heating and the young sprouts for feeding the animals while drought), bulrush and sedge (KISS, 2001; TÓTH, 1998; making equipments of everyday use – sometimes also for market purposes: CL, CR evidence, for later evidence, see ÉLŐ, 1937). Utilization took place continuously from the dryland settlements nearby (Fig. 5/A): in our case from the village of Sarród and the domain of Sárvár and Kapuvár, later of Süttör (Süttör is today part of Fertőd village).

Many of the 18th-century legal cases took place because of the controversies on the (former) "zone" of common pastures or commonly used areas belonging to the village(s) of our sample region (the most famous cases were between Sarród, Süttör, Pomogy/Pamhagen and Széplak; see e.g. MOL P623/124; P108/111-2; Processus appellati 5/5211), predominantly in the inundation area. Here in case of long-lasting dry periods such as the one in the first half of the 18th century, parts of the inundation area in the village boundary zones were clearly used by the herds of other villages, too (Fig. 5/B), which fact caused the above-mentioned controversies on clarification of the exact boundary line.

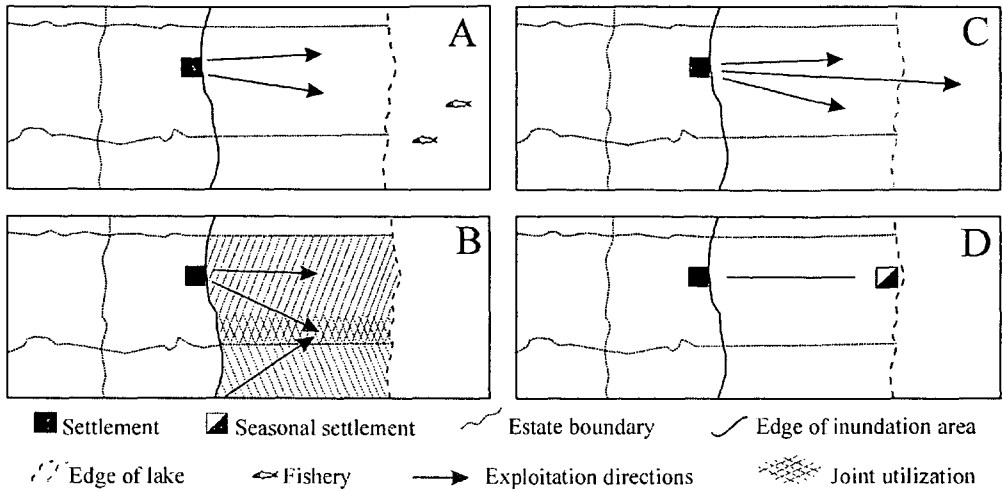


Figure 5. Main types of utilization in lake basins at low waterlevels

Still, no matter how low the actual waterlevel was, some parts of the inundation area – due to the existence of waterflows as well as small ponds and bogs – remained wet predominantly in the first half of the 18th century. In case of very low waterlevels of the lake, nevertheless, not only the inundation area but also part of the primary lake basin dried up and, therefore, became available for direct utilization (Fig. 5/C). In Fig. 5/D a probably quite usual, though before regulation works rarely mentioned case is represented: on the higher terrains - where later, after regulation works most of the manors were located - temporal settlements appeared in summer (thus, oxen could be kept and gathered without taking them back to the dryland – see KF/3; cadaster maps and conscriptions: MOL S 78, 79 Sarród, etc). After water regulation works, these temporal settlements rose as new economic centres in the newly created drylands, first in the form of manors; later these manors became, however, real permanent settlements in the former inundation area (e.g. Nyárosmajor, Mexikó/Fertőújlak).

#### Utilization of the 'islands'

Due to their importance in utilization, special attention should be taken to the 'islands' (ÉLŐ, 1937; MIHÁLY, 1971). In spite of the fact that in the whole neighbourhood there is only one such island (called Jakabsziget, today belonging to the neighbouring village of Süttör) which is frequently and exclusively mentioned in sources as a separate island throughout the early modern and modern period, on the basis of cartographic and some indirect written (urbarial conscriptions of 1767) as well as archaeological evidence we can certainly presume that many other 'real' islands and the so-called islands took significant role in the utilization of the inundation areas. The island-peninsula appearance depended on the waterlevel: they looked like real islands and/or peninsulas mainly in case of medium and high waterlevels (Fig. 6/A).



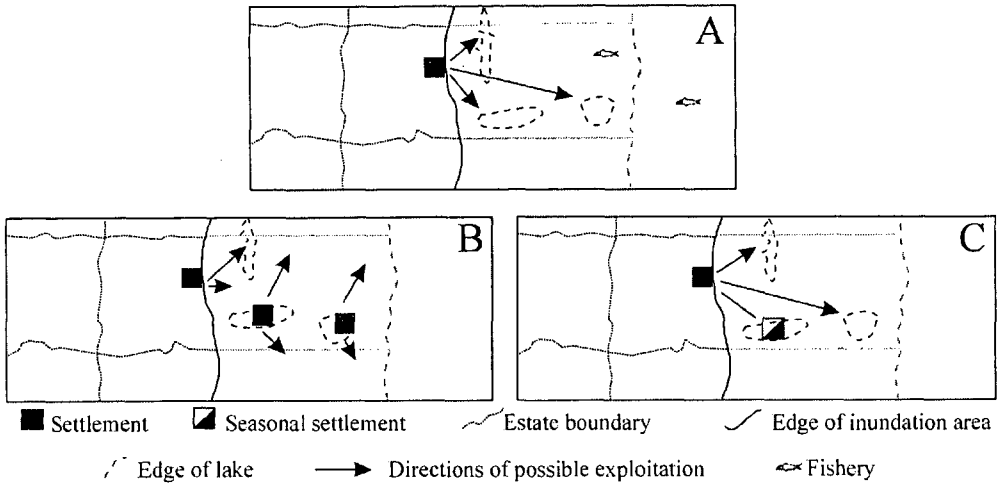


Figure 6. Utilization of the 'islands'

In reality, at least in the 19th century, under the name of an 'island' we have to count with at least two types of formations: one is the group of 'real' islands, entirely surrounded by water in case of medium and high waterlevels, while the other, so-called islands were probably rather peninsulas, lands with some direct connections to the mainland, but still looking as islands from the direction of the mainland (ÉLŐ, 1937). Nevertheless, these 'islands' could lose their typical features in case of waters lower than medium level. Based on charter- and archaeological evidence (e.g. MNMRA XVIII. 272; MIHÁLY, 1971 – archaeological survey of the islands; KISS – PASZTERNÁK, 2000 – complex survey of Urkony-Jakabsziget) we can say that the utilization of islands and probably their surroundings was the most intensive in the 13-15th centuries when (permanently inhabited) settlements were located there (Fig. 6/B). Some of these settlements later (from the 15th - early 16th centuries) became the place of temporal settlements (Fig. 6/B), while most of their territories then belonged to the neighbouring villages such as Süttör (today Fertőd) (Urkony-Jakabsziget; Feketebokor, etc) (Fig. 6/C). In the modern times, utilization was mainly characterised by meadows for mowing and pasture or in some cases arable lands as well (Fig. 6/A). For this latter case, we can cite examples based on written documents only from the 18th century (e. g. mainly in the Hanság basin), but especially from the mid- and late 19th century. Whereas in some cases still temporal settling places remained on the islands in the modern times (e.g. Jakabsziget), in many other cases no trace of later settlements (e. g. the islands east to the ford) were found (e. g. Feketebokor). After the great drought of 1865-8, followed by the regulation works, these 'islands' were the first places where new manors appeared (e. g. Mexikópuszta-Fertőújlak, Lászlómajor, Nyárosmajor), but some of them remained uninhabited, and later perished due to decades of deep-ploughing (e. g. Jakabsziget).

## Abbreviations

ALB – Allgemeine Landestopographie des Burgenlandes

MOL – Magyar Országos Levéltár/Hungarian National Archives

SLt – Soproni Levéltár/Sopron Archives

MNMRA – Magyar Nemzeti Múzeum Régészeti Adattára/Archaeological Database of the Hungarian National Museum

UetC – Urbaria és Conscriptioes

CR – Conscriptioes Regnicolaris

CL – Conscriptioes Localis

KF – Katonai Felmérés/Military Survey

## Maps

First Military Survey (KF1): Col. V. Sec. 11. (1782) – M 1:28800; Second Military Survey (KF2): Col. XXIII. Sec. 49. (1845) – M 1:28800; Third Military Survey (KF3): 4957/2, 4958/1. (1880) – M 1:25000.

MOL, Map Collection:

S 12. Div. XI. No. 34/2, 5 (turn of 18-19th c.): Fertő lacus mappa originalis qua pars mappa Arabonis generalis originalis. Ms; pedel; mpa; cb; 300x98 cm; o: NW.

S 12 Div. XVI. No. 8. (1782?): Olay, Franciscus jur. Geom. (Exam. Hegedűs, Joannes com. geom.): In Wieselburger Comitatus hat der neu errichtete Damm mit Inbegrief der Brücken 1838 ... M 1:25920.

S 12 Div. XVI. No. 10. (1782): Laab, Casparus com. jur. geom.: Mappa demonstrans situm paludum et localitatum aggeris Pomogyiensis in quantum terreno .... Comitatus hujus Mossoniensis ingremiatum furet, versus Eszterház ducentis .... M 1:19200.; 52,5x84 cm; o: N.

S 12 Div. XIII. No. 295:1. (Joannes Nep. Hegedüs com. Ord. Geom., Georgius Király ord. geom., Casparus Láb com. ord. geom.): Mappa Geometria exhibens Lacum Fertó(e) Palude Hansagh, et Districtum Tóko(e)zeiensem, una cum Projecto de demissione Lacus et exsiccatione Paludum exhibitio MDCCCLXXXI. (1781) 65x43,5 cm; M 1:108000.

S 78 Cadaster maps of the village of Sarród and Süttör (1856-7) – M 1:2880.

## Primary sources

Cadaster conscriptions: MOL, S 79: Villages of Sarród and Süttör (1855-6).

Conscriptioes Localis: MOL, Széchenyi family P 623 II. 5: Possessio Sárood (1767, 1792, 1728, 1754).

Conscriptioes Regnicolaris: Conscriptio regnicolaris Districtus Superioris Incltyi Comitatus Soproniensis. SLt: IV/A/14 (1715-20, 1727-8, 1752, 1828).

Károlyi, Á. – Szalay, J. Nádasdy Tamás nádor családi levelezése. Budapest: MTA, 1882. pp. 54.

Kis, J. "A Fertő tavának geographiai, historiai és természeti leírása." In: Rummy Károly György (ed) Monumenta Hungarica. Vol. 1. Pest, 1797-1816. pp. 229-424.

Lindeck-Pozza, I. – Goldinger, Z. – Zöllner, T. Urkundenbuch des Burgenlandes und der angrenzenden Gebiete der Komitate Wieselburg, Ödenburg und Eisenburg. Die Urkunden von 1328 bis 1342 mit Nachträgen von 1284 bis 1318. Vol. 2. Vienna: Hermann Böhlhaus Nachf., 1985. pp. 156-7.

Mályusz, E. "Nádasdy Tamás levelezése." 8. Levéltári Közlemények 7 (1929): pp. 231-77.

Mihály, P. "Régészeti kutatások a nyugati Hanságban 2." Soproni Szemle 25/2 (1971): pp. 109-17.

Mikó, S. "Az 1597. évi kapuvári urbárium 3." Soproni Szemle (1992): pp. 333-54.

MOL E 156: UetC Fasc. 56:33-36; UetC 12:42/3 (1608); UetC 12: 42/4 (without date); UetC 12: 42/6. 1639.

MOL Archives of the Prince Esterházy family, Repositorium 16: Documents of the Szentmiklós, Süttör and Hegykő manors. P 108/111-2. cs: Sarród.

MOL Archives of the Count Széchenyi family, village documents: P 623. 124. cs.

MOL Processus appellati 5/5211.

Nagy, I. Sopron vármegye története: Oklevéltár. Vols. 1-2. Sopron: Litfass Károly Könyvnyomdája, 1889. Vol. 1. pp. 253, Vol. 2. pp. 640.

Tóth, P. A Mária Terézia-kori úrbérrendezés kilenc kérdőpontos vizsgálatai Sopron megyében. I. Magyar és latin nyelvű vallomások (1767)/Antworten auf die Neun Fragepunkte der Maria Theresianischen

Urbarialregulierung im Komitat Sopron/Ödenburg. I. Ungarische und lateinische Bekenntnisse. Sopron/Eisenstadt: Soproni Levéltár/Burgenländisches Landesarchiv, 1998. pp. 171.

## References

- Allgemeine Landestopographie des Burgenlandes. Band 1. Der Verwaltungsbezirk Neusiedl am See. Eisenstadt: Burgenländischen Landesregierung, 1954. pp. 298-301.
- BÁRDOSI, J. (1994) A Magyar Fertő halászata. Sopron Hillebrand Nyomda Kft. pp. 18.
- BELÉNYESY, M. (1953) "A halászat a 14. században." *Ethnográfia* 64: pp. 148-65.
- ÉLŐ, D. Sarród monográfiája. Budapest: Országos Széchenyi Szövetség, 1937. pp. 25, 27-8, 112.
- FRISNYÁK, S. Magyarország történeti földrajza. Budapest: Tankönyvkiadó, 1995. p. 213.
- HERMAN, O. Magyar halászat. Vol. 2. Budapest: Királyi Magyar Természettudományi Társulat, 1887. pp. 110.
- KALMÁR, I. "A Fertő tó vízrajza." In: Kováts Zoltán – Kozmáné Tóth Erzsébet (eds). *A Fertő tó természeti adottságai*. Budapest: Országos Meteorológiai Szolgálat, 1982. pp. 126-41.
- KISS, A. "A Fertővel kapcsolatos vitás földrajzi kérdések középkori okleveleinkben." *Soproni Szemle* 53,1 (1999): pp. 53-62.
- KISS, A. "Hydrology and Environment in the Southern Basin of Lake Fertő/Neusiedl in the Late Middle Ages." *Medium Aevum Quotidianum* 44 (2001): pp. 61-77.
- KISS, A - PASZTERNÁK ISTVÁN. "Hol volt Urkony? Történeti földrajzi és régészeti adalékok egy középkori falu topográfiájához." *Soproni Szemle* 52,4 (2000): pp. 402-19.
- KOPF, F. "Wasserwirtschaftliche Probleme des Neusiedler Sees und des Seewinkels." *Oesterreichische Wasserwirtschaft* 15,9-10 (1963): pp. 190-203.
- KOPF, F. "Der neue Wasserlaushalt des Neusiedler Sees." *Oesterreichische Wasserwirtschaft* 26,7-8 (1974): pp. 169-180.
- LUKÁCS, K. "Adatok a Fertő és Rábaköz halászatának történetéhez." *Ethnografia* 64 (1953): pp. 282-90.
- MAKSAY, F. A magyar falu középkori településrendje. Budapest: Akadémiai Kiadó, 1974. pp.53.
- PANNONHALMI, M. "A Fertő-tó vízgazdálkodása." *Vízügyi Közlemények* 81,2 (1999): pp. 277-91.
- RIPPON, S. *The Transformation of Coastal Wetlands*. Oxford: University Press, 2000. pp. 51.
- SOÓS, I. "Adatok a sopronmegyei középbirtokok 16. századi történetéhez." *Soproni Szemle* 1,3-4 (1937): pp. 259-79.
- SZABOLCS, I. – ÁBRAHÁM, L. "A Fertő tó menti szikes talajok." *Agrokémia és Talajtan* 6,2 (1957): pp. 99-107.
- SZAMOTA, I. – ZOLNAY, GY. *Magyar oklevélszótár*. Budapest: Akadémiai Kiadó, 1906. pp. 243.
- SZONTAGH, T. *A Fertő-tó geológiai és mezőgazdasági viszonyainak tanulmányozására kiküldött bizottság jelentése*. Budapest: Pallas Részvénytársaság Nyomdája, 1903. Map appendix.
- ZORKÓCZY, Z. "A tómeder, vízgyűjtőterület, valamint a vízháztartás adatai." In: Aujeszky, L. – Schilling, F. – Somogyi, S. (eds). *A Fertő-táj Monográfiáját előkészítő adatgyűjtemény*. Vol. 2. *Természeti adottságok: A Fertő-táj hidroszférája és vízgazdálkodása*. Budapest: Vízgazdálkodási Tudományos Kutató Intézet, 1975. pp. 5-43.

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