

SOME IMPORTANT ASPECTS OF WATER REGULATION ON THE DRAVA UNTIL THE 1ST WORLD WAR

NEKOLIKO VAŽNIJIH ASPEKATA REGULACIJE DRAVE DO PRVOG SVJETSKOG RATA

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Summary

River Drava is the 3rd most important river of Hungary after Trianon and always played a significant regional role in spatial transport and agricultural economy in the Hungarian Kingdom. In the study I present the regulation measures following the periods concentrating on the 18th and 19th centuries. Before the 1st World War the Hungarian Kingdom was making significant efforts in order to regulate the Drava. These were serving three major aims, the first was to increase the areas that can be involved into agriculture through drainage of swamps and the watery bottomland areas. From the point of view of economy it can be considered as a success.

Key words: Drava, regulation works, 18th and 19th centuries, water transport

Ključne riječi: Drava, regulacijski radovi, 18. i 19. stoljeće, riječni promet

INTRODUCTION

River Drava is the 3rd most important river of Hungary after Trianon and always played a significant regional role in spatial transport and agricultural economy in the Hungarian Kingdom. The river is having a significant political geographical and geopolitical importance in the Croatian-Hungarian relations nevertheless the river and its surrounding areas created an internal border between the two countries.¹ Having a look at its historical background it formulated one of the most constant border sections concerning public law and ethnic aspects as well. The researched area, the areas along the river and the catchment basin of the Mura-Drava exceeds 40 000 km². My investigation focuses on the Drava and the surrounding Mura-Drava catchment area's smaller part on the eastern forefront of the Alps covering the part which belongs to the Carpathian Basin (Lovász, Gy., 1972., Remenyik, B., 2005., Kalmár, G., 1942).

The regulation history of the water system of the Drava accommodating to the formation of the capitalist economy can be divided into two major parts (Gulyás, L. 2009/c., Ihrig, D. 1973, Sršan, S. 2003):

- period: from the beginning to 1867
- period: from 1867 until the beginning of the 1st World War.

In the study I present the regulation measures following the upper periods concentrating on the 18th and 19th centuries. It is obvious that the regulation of the water system was significantly influenced by the great historical events of the age, so I completely accommodated the age classification to them (Gulyás L. 2009/a).

¹ The 1868 XXX. act commands the Croatian-Hungarian Compromise. It clearly states that the border between the two countries is only internal administrative border it cannot be considered as state border.

The regulation of the Drava was tightly fitted to the conscious infrastructure development concept of the Hungarian Kingdom. It was marked out not only for being a part of a river water route system of the Carpathian Basin (Tisza-Danube-Drava), but from Zákány (Gyékényes) and from Barcs they created a connecting point with the train, assuring the possible transport of river supply up to the Adriatic. The construction of the sections connecting South Transdanubia with the railway network started after the Compromise. In The establishment of the Pécs-Barcs line started in 1868 and in the same year the Barcs-Nagykanizsa line was initiated. The main objective for both the imperial and the local interests was to extend the existing network towards southeast, interconnecting the southern and Great Plain regions as well (Ruzitska, L. 1964).

The new 133 km long Villány-Eszék (Osijek)-Dálja (Dalj)- Gombos (Bogojevo)-Zombor (Sombor) section was established as the 4th measure of the Great Plain-Fiume train. The established system made the connection possible to the areas along the Drava and Mura with the Austrian provinces, which was the greatest market for the agricultural products produced in Slavonia, along the Drava and South Transdanubia (T. Mérey, K. 1979, Erdősi, F. 1986, Majdán, J. 2005, Gulyás, L. 2009/b).

THE REGULATION WORKS FROM THE BEGINNING TO THE COMPROMISE

The region along the Drava already appeared in the works of Strabo entitled »Dravos«. The Romans were the first during Emperor Probus who consciously aimed to eliminate the swampy areas around the river with an area of 115 000 hectares. The main riverbed frequently changed its allocation resulting in the formation of spillstreams on the left. The river bad regulation works were also explained by the transport reasons since the important Roman trade routes advanced through in this region for instance from Sopianae to Illyria. And the right river bank served as a military route for Varaždin (Aqaviva) to Dalj (Teutoburgium). The era of Migration demolished the dams and water drainage systems and the maintenance and regulation works were also ceased. In the period of the Hungarian Kingdom already in the Árpád Era the »great politics« were already dealing with it. One of the charters of King Béla III dealing with the estates of the crusader knights in Fejérvár gives some information on the contemporary historical geographical environment. The Fekete-víz and the Okor River did not exist at that time or only periodically and the shore areas west from Zala and Markóc were also watery. Around 1190 north from Zákány not far from the merging of Mura at Őrtilos the river flew in two beds. Nevertheless the region along the Mura was exempted from permanent floods, the area among the Mura and the Drava, the region of Čakovec was considered as a swampy area by the contemporary descriptions. The 1292 and 1294 charters of the Captiular Archives of Pécs already dealt with the advantages and problems of the economic utilisation of the river and list the flooding and swampy sections as well: Suklius (Siklós), Nogfalu, (Nagyfalu), Horosztzy (Egyházasharaszti) and the surrounding areas of Alsószentmárton. The region was called »Otologia stagnum« (Ihrig, D. 1973, Remenyik, B. 2002.).

The Hungarian written geographical professional literature first mentioned the area besides the Hungarian name in Latin (Dravus) and in German (Drau). András Vályi in its description on Hungary characterises »*Slavonica or Tót country separated from Hungary*«. Its headwaters is in Steiermark, it steps in the country at Legrad, »forming an island around »Zákány, Liszok, Udvarhely« such as at Darda. It joins the Danube in Eugeniusfalva, south from Darócz, oppositely to Bogojevo (Vályi, A. 1796, T. Mérey, K. 2002 195 p.).

With the appearance of the Turkish Empire, after the 1526 defeat in Mohács, the region became a buffer zone and later only the 1690 liberation of Kanizsa established the long term conditions for preparation and implementation of the river regulation. Although I mentioned above that so far it created the most durable state border of the Hungarian Kingdom, the controversial affiliation of the case of the Répás district is inevitable to be mentioned. Essentially the change of the state border due to the change of the river bed and the floods implicated an ethnic realignment in the settlement and its regions which blue over the social economic status quo being prejudicial to the Hungarian nobility and genus. This

debate was present from 1715 until 1868 quite actively even in the Hungarian national assembly. The realignment remained in favour of the Croatian party (Kalmár, G. 1942, Hajdú, Z. 2006).

After the Turkish occupation in the middle of the 18th century on the initiative of the influential landholder baronial families (Batthyányi, Draschkovics, Festetics families) the planning of the river regulation and the drainage of the surrounding swamps started along their personal economic interests (*map 1*). In 1751 a law was taking care of the demolition of the water mills which were disturbing the construction, in 1753 the river valley was mapped and before that between 1740 and 1750 the »Drava Dam Association« was organised with the task of organising the construction and later on maintaining the completed buildings. Later on the construction of the dyke started, in the first measure from Darda to Drávaszabolcs, than in 1770 it was extended until Drávatamási. The system was built section to section. No digging was executed at the higher banks; at those areas the »ancient dams« were appointed. After the termination of the association in 1871 the maintenance was taken over by the Schaumburg-Lippe manor. The actual works started in 1784 during Joseph II. The Water Management and Architectural Directorate were established in 1788 controlling the constructions and the functioning of the water associations. It already revealed itself in the first decades that there are harmful impacts of the change of the river bed structure and the drainage works as well. The flood levels became higher and higher and 1827 brought a catastrophic flood none the less the coordination of the construction and maintenance of the dams along the Drava between Somogy and Baranya counties was already carried out in 1819. It was also accompanied by the regulation of the more tributaries such as the Fekete-víz. The Feketevíz Drainage Company was established in order to solve this on 4th April, 1839. The hydrographical mapping of the Drava started from 1835 led by Lipót Vauthier with the engineers redeployed from the regulation of the Danube. The first section was mapped on the Drava from 1842 to 1846, the first phase was finished in 1846. During the construction works 62 cut-offs were carried out on the Drava which shortened from 350 km to 263 (Ihrig, D. 1973, T. Mérey, K. 2002, Remenyik, B. 2002, Božić Bogović, D. 2013).

The construction works were further continued after the 1848-49 revolution and war of independence which was explained by the greater and greater floods. Several times the river stepped out from its new river bed making a way to the old one or it split into further branches, increasing the area of the flooded regions. Between 1850 and 1860 bend cut-offs were accomplished in 8 places altogether.

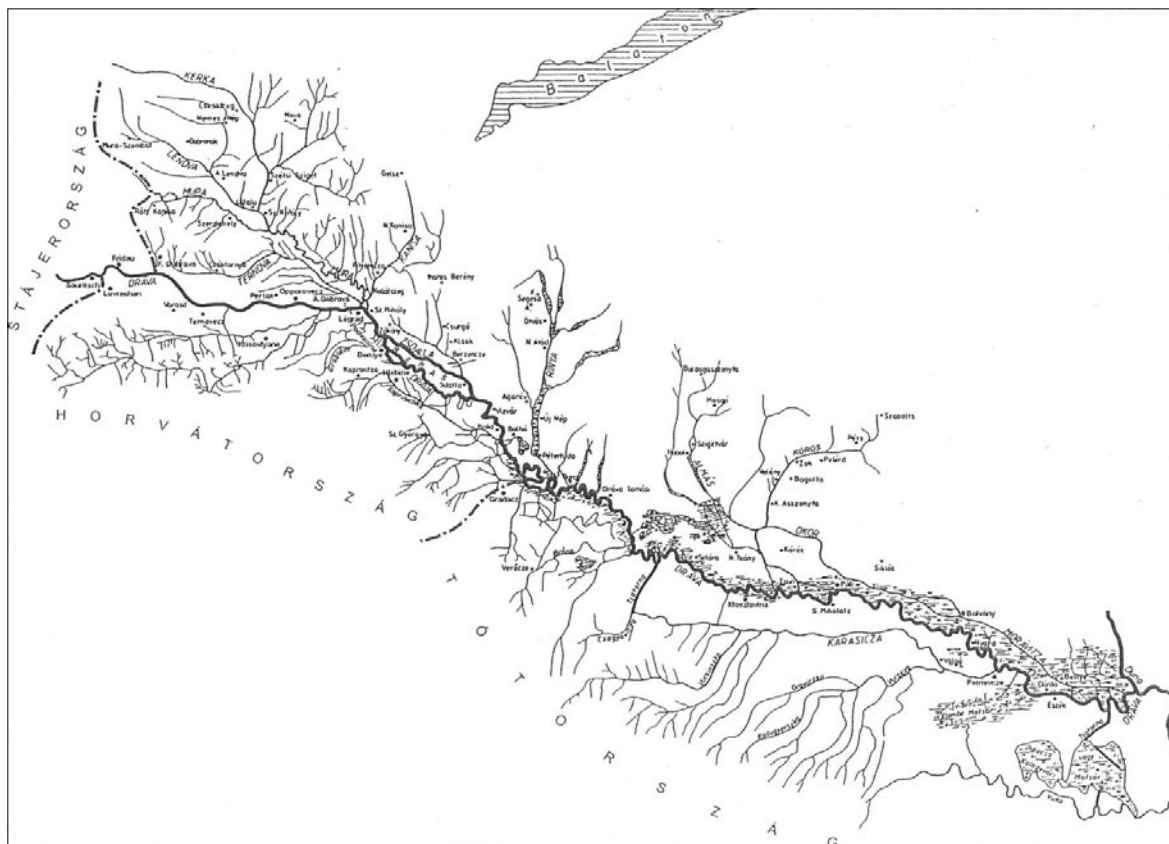
REGULATION WORKS FROM 1867 TO THE BEGINNING OF THE 1ST WORLD WAR

a) from 1867 to 1883

Before the Compromise in the very early ages, at the time of the Romans and the Árpád era, than after the expelling of the Turkish in the 18th century the primary aim of the river regulation works was the re-conquest of the flooded, swampy areas for agriculture. From the 2nd half of the 19th century the other reason for the human interference was to enable to river for shipping on as long sections and for as much time during the year as it was possible.

The Drava was navigated even by the Romans, although an important mention was only from 1795, stating that 4 ships were navigating to the nearby of Zákány with 6 000 weigh of salt, significantly approaching Kanizsa. In this era the river was part of the Tiszaföldvár-Steiermark water transport route. It bears evidence of the regular ship traffic that in the nearby of the river banks some settlements were also concerned with ship manufacturing. In Virovitica wooden rower ships were built from oak from already the beginning of the 19th century. For instance the first steam ship of the country was built in the nearby of Sellye made by Antal Bernhard. It was set afloat with the name Carolina in 1817 and it was a steamer transporting wood and sulfuric acid between Osijek and Mohács (Erdősi, F. 1971, Remenyik, B. 2002).

The formation of the regular ship traffic, actuated with either vital fore or by steam, was significantly influenced and obstructed by the unregulated river and its weather peculiarities. Besides this the morphological characteristics of the river bed also prohibited the safe and permanent conditions. The



Map 1. The Transdanubian section of the Drava in the beginning of the 19th century. Source: T. Mérei, K. 2003. 497 p.

peculiarities of the water flow of the middle course river suddenly changed especially at the time of shallow water level because of the logs and trunks in the river bed. They caused river deposit accumulation advancing reef formation.

The logs and trunks played a role in the formation of the unpredictable river bed and caused several times shipwrecks, submergences and other accidents. In the sections below Osijek due to the backwater effects of the Danube the deposit transporting ability of the water decreased, the wide river bed silted up and reefs were formed. In the Aljmaš-Osijek section it occurred that due to the low water level the passengers were transported on the critical sections with boats with lower dive line and they were put from one stream ship to the other. After the Compromise the regulation started with the management of the River Engineering of Osijek, supervised by László Jankovich, Lord Lieutenant of Somogy County. They managed to shorten the section between Barcs and Drávafok in the 1880s from 162 km to 144 km and the permanent water depth was maximised between 1-1,5 metres. However, they could not manage this from Osijek to the estuary to the Danube. Due to the sedimentation ship transport was sometimes paused for weeks (Erdősi, F. 1971, Lovász, Gy. 1972).

b) from 1883 until the 1st World War

In the period between 1883 and 1894 a separate regulation plan was made for the river and so the construction works between Barcs and the estuary to the Danube were carried out based on this. But the problem of sedimentation caused constant concerns and so the positive changes of the 1884-1888 period in terms of shipping soon broke off and in 1891 the Osijek River Engineering Bureau started the preparation for new dredging constructions. The Drava was also involved in the national river regulation concept of Gábor Baross, Minister of Transport and Baross personally participated in the field survey before the planning. I will not cover the constant problem of the safeguarding of the budget, but I have

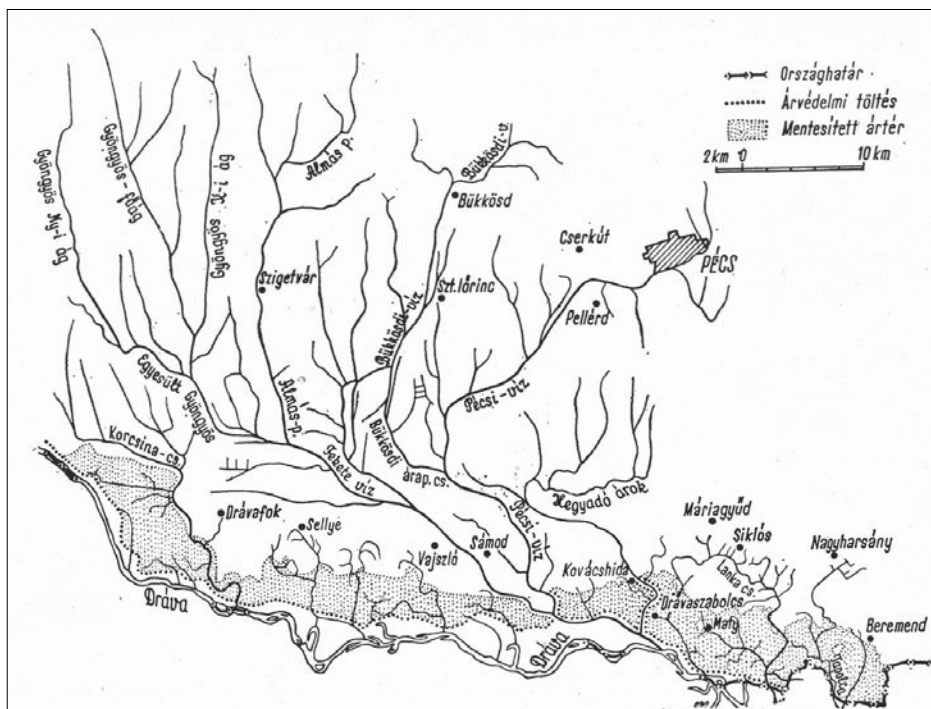
to mention that only one third of the costs appearing in the plans were spent during the investments, for the others there were no sufficient funds available. (Erdősi, F. 1971, Ihrig, D. 1973.).

The actual construction started in 1895 when the main objective was to constantly guarantee the mean water level on a 197 km long section of the Drava between Zákány and the estuary to the Danube. A regulation plan completed in 1904 imagined the river bed with the following width parameters (Erdősi, F. 1971):

- | | |
|-------------------------------------------------------------|-------|
| 1. between Varaždin and Legrád | 150 m |
| 2. between Legrád and Barcs | 160 m |
| 3. between Barcs and D. Mihojlac | 170 m |
| 4. between Osijek and Drávatorok (the estuary of the Drava) | 200 m |

The construction works were started from the Danube towards the direction of Barcs because the river was the busiest on this section. The conditions for shipping were extremely unfavourable notwithstanding the already mentioned interfering constructions. For instance between Budakovác and Csadjavica the river remained at its completely natural state, in many cases varied with a half metre deep river bed and shallows. And the width of the shipping route narrowed to 25-35 metres. The 1907 data well reflect the eligibility of the Drava for river transport (Erdősi, F. 1971):

1. between the Drnje-Vízvár 41 km long section it is characterised by upper course features, continuously degrading or building the banks frequently changing its river bed
2. it has a permanent river bed in the 37 km long Vízvár-Barcs section, the bank reinforcements reached their objectives
3. the section between Barcs and Detkovác is too wide, in the summertime there is no sufficient depth for shipping
4. it is the least capable for shipping between Dektovác and Szopje, the river bed is collapsing, the basement is cloggy and favours the formation of reefs
5. besides a relatively small amount of river bed maintenance works the Szopje-Osijek and the Vízvár-Osijek sections were appropriate to establish the conditions for shipping.



Map 2. The network of the Middle Drava and the Fekete-víz. Source: Ihrig, D. 1973. 278 p.

SUMMARY

Before the 1st World War the Hungarian Kingdom was making significant efforts in order to regulate the Drava. These were serving three major aims, the first was to increase the areas that can be involved into agriculture through drainage of swamps and the watery bottomland areas. From the point of view of economy it can be considered as a success. The second was the improvement of the situation of flood-prevention, which achieved considerably successes, the permanent regulation works basically decreased the danger of floods. The third major aim namely to make the river capable for shipping was not successful. The river bed and the hydrological structure did not enable the achievement of this objective, it could be shipped only fractionally while there were frequently significant problems even in the Barcs-Osijek section in the water transport.

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SAŽETAK

Rijeka Drava je treća najvažnija rijeka Mađarske nakon Trianona i oduvijek je imala značajnu regionalnu ulogu u prostornom prometu i poljoprivrednom gospodarstvu u Mađarskom kraljevstvu. U studiji predstavljam mjere regulacije nakon razdoblja koncentriranja na 18. i 19. stoljeće. Prije Prvog svjetskog rata ugarsko kraljevstvo poduzimalo je značajne napore kako bi reguliralo. To su napori služili trima glavnim ciljevima: prvi, povećati područja koja se mogu uključiti u poljoprivredu kroz odvodnju močara i vodenih nizinskih područja. To se sa stajališta ekonomije može smatrati uspjehom.

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