

The change of the urban network along the middle and lower Danube during transition

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Abstract

The economy and urban development of the riparian regions have been partly determined by the Danube as an inland navigation line (e.g. Dunaújváros, Smederovo, Lom, Calarași etc.), or the economy of these towns has been based on the other features of the river (e.g. Komárom/Komarno, Nyergesújfalu, Paks, Orsova, Vidin, Kozloduy etc.). In the aftermaths of the collapse of the communist regimes and the Soviet Union and the blockade of the traffic due to the crisis of ex-Yugoslavia, the role of the Danubian transport line was changed radically (Hardi 2012). Due to these changes and the emergence of the new economy, the function and situation of these towns transformed in the last two decades. Some of them could use the new possibilities, but many of them lost their economic basis and population, becoming a peripheral region or town. Our paper gives a comparative study about the features of the Danube towns, and characterizes the typical development ways of the riparian towns. The present study summarizes the experiences of an academic exchange programme among Romanian, Bulgarian and Hungarian institutions.

Keywords: *the Danube, urban development, town-network, spatial development*

Rezumat. Schimbări în rețeaua urbană de-a lungul sectorului mijlociu și inferior al Dunării în perioada de tranziție

Economia și dezvoltarea orașelor din regiunile riverane Dunării au fost parțial determinate de fluviu, prin funcția portuară pe care acesta le-a imprimat-o (ex. Dunaújváros, Smederevo, Lom, Călărași etc.) sau prin alte caracteristici ale fluviului (ex. Komárom/Komarno, Nyergesúfal, Paks, Orșova, Vidin, Kozlodui etc.). În urma prăbușirii Uniunii Sovietice și a sistemelor politice comuniste din statele riverane Dunării și după blocada traficului naval ca urmare a crizei din fosta Iugoslavie, rolul axei dunărene de transport s-a schimbat radical (Hardi 2012). Datorită acestor schimbări și ca urmare a dezvoltării unor noi sectoare economice, funcția și importanța acestor orașe s-a modificat considerabil în ultimele două decenii. Unele dintre ele și-au pierdut baza economică și au devenit orașe sau regiuni periferice, altele au folosit sau ar putea folosi noile oportunități de dezvoltare. Lucrarea noastră oferă un studiu comparativ al orașelor dunărene și evidențiază modalitățile tipice de dezvoltare a orașelor riverane Dunării. Ea se rezumă la un program de schimb interacademic între România, Bulgaria și Ungaria.

Cuvinte-cheie: *Dunărea, dezvoltare urbană, rețea de orașe, dezvoltare spațială*

Introduction

The Danube and the cities characteristic types evolved along the Danube River, their existence and development being linked to the river. Three characteristic types can be separated: 1) bridge cities that are situated on one bank of the river or on both banks, or in the vicinity of the bank; 2) city pairs that are defense formations along the river that was a border for a long time; and 3) cities created by activities related to the river (Fig. 1). These three characteristics can of course be present at the same time in the same city, and can evolve into each other during the course of development.

Bridge cities. The birth of this city type is linked to the crossing facilities on the river (Mendöl 1963). Crossing opportunities were linked at that time of the start of goods transport to certain easily crossable sections of the rivers (fords, ferry), which could only be used temporarily. Consequently, at these favourable locations, special functions were established for the storage of goods, with a consideration to those times when the river cannot be crossed (ice drift, flood, small water level etc.). This means that they were built right on the river

bank or, if that was not suitable for settlement, a little bit farther away from that. These points attracted trade routes, so later the permanent bridges were built there. After the construction of the bridge the established centre continued to develop. Typical cities at the upper and middle reaches of the river are the bridge cities that developed to become regional centres or capital cities. They are junctions of the socio-economic development in all cases.

Their specialty is that they usually were established on one bank of the river, then, after the construction of the bridge, they became two-bank cities either by natural growth or following the integration of smaller settlements on the other side. This type involves the capital cities (Vienna, Bratislava, Budapest, and also Belgrade from the 20th century), and also the riverside regional centres like Ulm, Regensburg, Passau, Linz, Győr, Komárom, Esztergom, Baja, Sombor, Vukovar, Novi Sad and Smederevo. Of course the growth of these cities was affected throughout history by several other factors in addition to the bridge city role. The possibility of crossing in itself only designated their exact location.

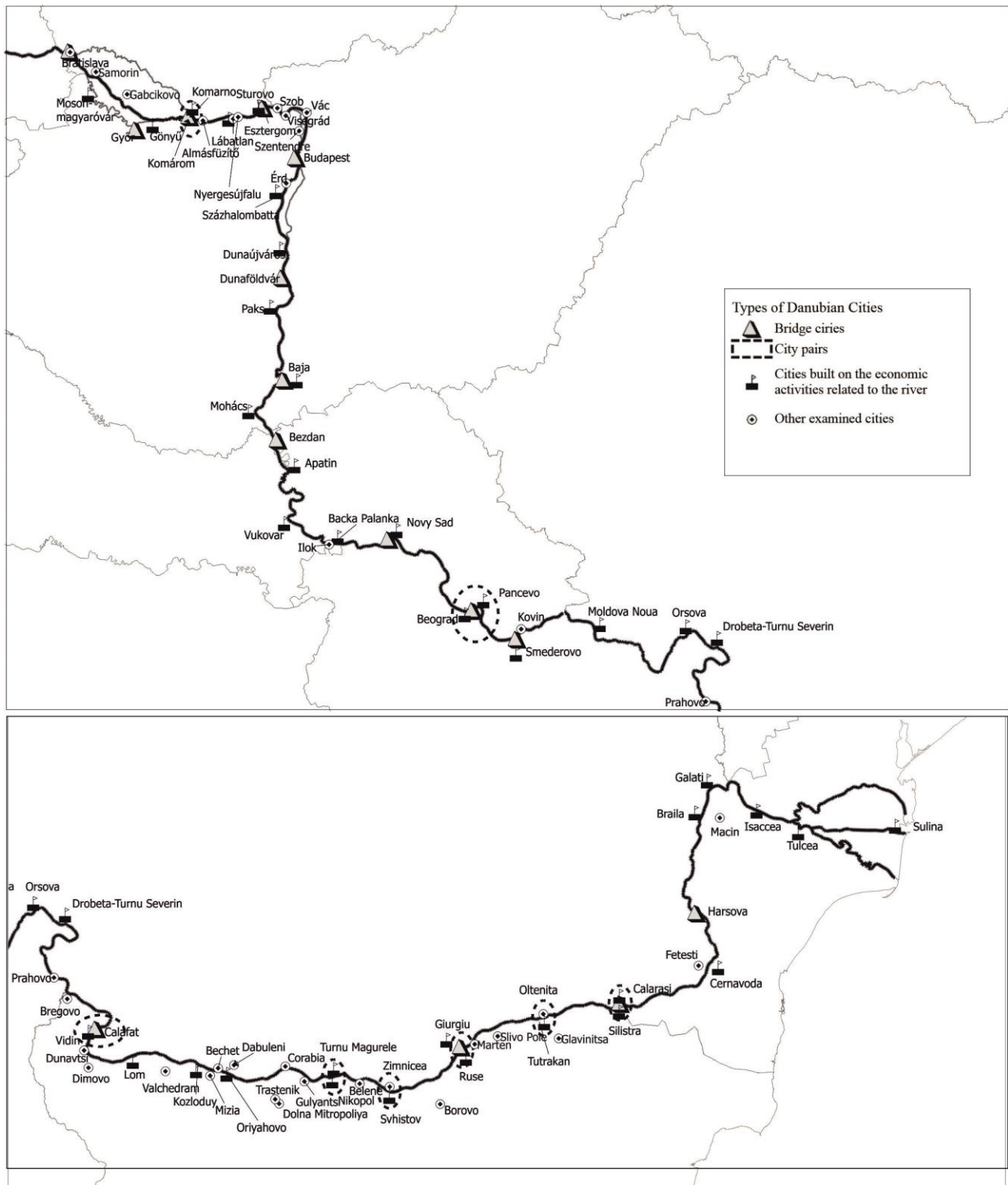


Fig. 1: Danubian city types (Source: Tamás Hardi)

City pairs. On the river sections making borders, the birth of cities opposite to each other on the two banks was typical. These cities were usually border cities and fortresses during their history, and their main function was to control Danubian traffic and the possibility of crossing. Several such city pairs can be found at the lower reaches of the Danube River (Săgeată 2004). Most of the Danubian urban

settlements in Bulgaria were founded as fortresses along the higher right (southern) bank of the river. Later, those settlements developed as ports, trading centres and fishing settlements. These towns still develop in a relative isolation from each other, and there exist few socioeconomic relationships between them. Independent of each other, similar economic structures were built out in them (e.g. cellulose

manufacturing). On the basis of the present economic situation of the town, a more intensive cooperation can only be expected in the longer run. The only exception from this is the Giurgiu–Ruse town pair, where the only existing road and railway bridge was constructed in the fifties of the 20th century. The town pair has the chance to become a dynamic common bridge town in the foreground of Bucharest. Another town pair with such potential is Vidin and Calafat, between which the second bridge of the Romanian–Bulgarian Danube section was constructed. The cohesion between these two towns is weaker than in the case of the former pair, but the completion of the large capacity bridge and the related transport corridor may improve the situation. This seems to be a contradiction, on the other hand, to the fact that Vidin is located in one of the poorest regions of Bulgaria (and the whole of the European Union), having suffered a considerable economic decline in the recent years. It is feared that the built corridor will exert the “channel” effect described by Ferenc Erdősi, i.e. traffic will simply rush above them, without having an economic development impact. By the development of water transportation, however, it may become an important logistics centre. Towns built on the economic activities related to the river. This category includes towns serving the management of navigation, which not necessarily and not exclusively entails port functions, but for example traffic junctions determined by geographical endowments. Moldova Veche, Moldova Nouă, Orșova and Turnu Severin at the Lower Danube are such examples. These settlements were traffic points for ships passing through the difficult sections of the river, where they had to wait in case of water levels not suitable for navigation, and these were also the towns where the pilots were obligatory hired for passing through. A similar function was played by Tulcea in the Delta area. An important traffic point on the upper Hungarian reaches is Gönyű, which did not develop into a town because of the vicinity of Győr, but its importance in Danubian navigation far exceeds its size. In Kálmán Tóry’s words, it is the “shunting yard” of the Danube River, because the reach upstream from this is hardly navigable, so ships coming from the east with full load were forced to unload or reload to other, smaller vessels. This function strengthened in the 18th century; according to contemporary documents, fishing seemed to be the main occupation at that time. During the 18th, 19th and 20th century, navigation became the main source of living for the settlement (according to the minutes of a church visit in 1748: “There is no major objection to the inhabitants other than the awful swearwords of the Calvinist shipmen”). In the Bačka Region, Bačka Palanka became the centre of cereals transport, despite the fact that it is not located right

on the river bank. During the time of industrialisation, several settlements relying on the transport capacity or the industrial water of the Danube River developed; the river typically attracted centres of heavy industry, chemical industry or energy production. We can mention here Linz, Almásfüzitő, Dunaújváros, Paks, Smederevo, Turnu-Severin, Vidin, Lom, Kozloduy, Silistra, Călărași, Cernavoda etc. Until the end of WW 2 the industry in Bulgaria had manufacture features and the Danubian towns had mainly administrative, cultural and trading centre functions. The industries that were developed by that time were mostly food-processing and textile industries. Ruse was the most industrially developed town with its metal processing, textile, petrochemical industries.

Of course there are transitory or transforming types among these cases as well. An example for this is the Komárom/Komarno town pair that used to have county seat function, on the northern bank of the Danube River (so it was a single-bank town), with a functional foreground on the other bank (Újszóny), and it transformed into a town pair after the drawing of the state border. Also, Novi Sad and Beograd changed from being border cities (city pairs) into two-bank regional centres. There are cities that fit into several categories. Dunaújváros was born as an industrial town capitalizing the fluvial transport of raw materials, but now, having a bridge, and a commercial port, it is an important bridge town that is rapidly developing. Industrial and port/traffic functions exist parallel in several towns, too, such as Linz, Smederevo, Lom, Galați etc.

These examples clearly show that the urban network developing impact of the Danube River and its impact on spatial development, through the centres, is an existing phenomenon (Gál 2001). These impacts could not only be seen in the past, but these days as well.

The features of the towns of the common Hungarian–Slovak section and of the inner Hungarian section are somewhat different from each other. On the Hungarian Danube section, traditional trading towns evolved, which grew by using the booming demand for cereals in the 19th century. The ports of Mosonmagyaróvár, Győr, Komárom, Budapest, Dunaföldvár, Baja and Mohács all had considerable traffic in the 19th century (Gráfik 2004). Győr and Budapest stood out in this respect. The loads of cereals coming from the Great Hungarian Plain and heading to Vienna had to be reloaded here – because of the breaking of the Danube River into many small branches at the Szigetköz area – to smaller ships, later to railway. Budapest took over the role of being the most important cereals port in the second half of the 19th century. The importance of the cereals ports decreased in the second half of the 19th century

following the building of the railway network; it was especially Győr that lost its significance. The Budapest-centred nature of the Hungarian railway network, on the other hand, made the Hungarian capital city the second most important mill industry centre of the world for a few decades.

The industrialisation of the Danubian areas gained momentum in the last three decades of the 19th century along the upper Hungarian reaches and in Budapest. Győr developed into a significant engineering centre (manufacturing of rail- and later road vehicles, later weapon manufacturing), while the industry of Pozsony (the later Bratislava) and Budapest was developing in more sectors. This founded the birth of the Vienna–Budapest industrial axis that has been an important economic axis of the region since its creation.

Following World War I, the disintegration of the Austria-Hungarian Monarchy and of Hungary had a great negative impact on the economy of these towns, because they lost their markets. In the 1920s, the industrialisation of Győr started again, especially in the field of automotive industry and weapon manufacturing. The port functions of Budapest were appreciated again, as Hungary had lost its only sea port in Fiume (Rijeka). Hungary kept in touch from Budapest with its markets in the East Mediterranean by special river and sea ships travelling on the Danube River of international status (this fleet was in use right until the 1970s), so the Danube River was the only free access of Hungary to the seas. In this period Budapest almost functioned as a sea port.

Industrialization after World War II already concerned Danubian cities that were untouched by the first wave of industrialization. Dunaújváros became a symbol of socialist industrialization, and, similarly, Galați, became a heavy industry centre built on the raw materials transported from the Soviet Union on the Danube River. (It is interesting that the Hungarian leadership first wanted to build this centre at Mohács, a better endowed town, and slightly closer to the raw materials of the Soviet Union, but the worsening of the political relationships of the socialist countries with Yugoslavia in 1948 did not allow an investment of such strategic significance to be made right beside the border.) These were the decades when industrialization took place on the Danube section between Komárom and Esztergom (Lábatlan, Nyergesújfalu), where a new industrial agglomeration emerged on the basis of chemical industry and cement manufacturing. South of Budapest, Százhalombatta became the centre of Hungarian petroleum industry. Southwards, major industrial development along the Danube River in Hungary could only be seen in Paks, the town of the nuclear power plant of Hungary.

The industrialization of the Bulgarian and Romanian Danubian areas began after WW II. The river was used as a transport axis along which water-consuming import-export-dependent industries were developed, as well as port services supplying various industries in the hinterland (the interior of the country). Needless to say, the import-export was entirely oriented to COMECON countries. The peak of utilization of the river's transport potential was between 1950 and 1970. From that year on, the river navigation significantly lost its intensity: the short-distance navigation ceased and shortly after that – the passenger lines as well. The main shipment destination was the USSR – an import source for coal, ores, metals, oil and oil products, timber (according to a bilateral agreement for timber logging in the Komi Republic) etc. Production of the food industry and textile (fibre) was mainly exported. Based on imported raw materials, chemical industry, wood-processing and food-processing industries were developed in Ruse, Vidin, Silistra and Lom. The nuclear power plant in Kozloduy and the chemical plants in Vidin (chemical fibres) and Svishtov (chemical fibre) were also located along the river, as well as cellulose and paper-producing plants in Mizia and Silistra (because of huge demand of water of this industry). Along with the enterprises directly connected to the river, machine-building (Vidin, Lom, Ruse, Oryahovo, Marten), metal processing (Ruse, Tutrakan, Silistra etc.), electrocarts (Lom), small vessels building (Tutrakan), textile and apparel industry (Vidin, Lom, Oryahovo, Kozloduy, Ruse, Tutrakan, Silistra) and food-processing (Vidin, Lom, Svishtov, Gulyantsi, Ruse, Slivo Pole, Tutrakan, Silistra) were also developed. The major part of those plants produced for the COMECON countries and also for the domestic market. Most of them were small-scale enterprises and were branches of larger enterprises from the inner regions and therefore with little potential for effective development.

On the Romanian side, the Danube became an axis that attracted different industries: chemistry at Giurgiu, Drobeta-Turnu Severin, Turnu Măgurele, Giurgiu, Brăila and Tulcea; hydro-electrical power stations at Porțile de Fier I and Porțile de Fier II, thermo-electrical power stations at Drobeta-Turnu Severin, Brăila and Galați; integrated metallurgical complexes at Galați and Călărași; nuclear power stations at Cernavodă (Fig. 1). The consequence: ecological problems with cross-border implications caused by northeast and northwest winds, and tenseioning cross-border relationships several times.

The changing role of the Danube during the transition period

Before looking at the change in the situation of the Danubian towns, it is necessary to have an

overview of the transition of the Danubian navigation and trade in the last decades.

Although the density of the ports is evidently higher in the middle reaches of the river, by the weight of their turnover we can say that the spatial focus has been relocated to the section of the river close to the sea. The statistical figures published by Ferenc Erdősi reveal that the role of Budapest, in position one between and after the two world wars, has weakened, both as regards the rank and the volume of transported goods (Table 1). The volume of the goods traffic has decreased everywhere compared to the figures of 1984, except for Galați where a slight increase can be seen. Linz has managed to keep its position more or less. Budapest and Bratislava changed their ranks; today it is the capital city of Slovakia that boasts with the most important port of the middle section of the Danube River.

Table 1: Order of the first five or first 10 busiest Danubian ports, 1950, 1955, 1984, 2005

In 1950 (1000 tonnes)		In 1955 (1000 tonnes)			
1	Budapest	2,288	1	Regensburg	2,200
2	Regensburg	1,322	2	Linz	2,000
3	Reni	1,202	3	Belgrade	2,000
4	Linz	1,200	4	Reni	1,800
5	Belgrade	1,075	5	Izmail	1,600

In 1984 (1000 tonnes)		In 2005 (1000 tonnes)			
1.	Reni	12,275	1.	Galați	8,740
2.	Izmail	9,891	2.	Izmail	6,682
3.	Galați	8,390	3.	Linz	4,838
4.	Budapest	5,373	4.	Bratislava	2,545
5.	Linz	5,177	5.	Reni	2,242
6.	Bratislava	4,806	6.	Tulcea	2,047
7.	Ruse	4,390	7.	Smederovo	1,993
8.	Giurgiu	3,464	8.	Ruse	1,863
9.	Komarno	3,463	9.	Budapest	1,595

Source: ERDŐSI 2008 p. 123, based on statistics of the Danube Commission

In the 1950s, Budapest was the port city with the biggest turnover on the Danube River (Erdősi 2008), but its role in navigation went on decreasing in the seventies and eighties (Table 2), and finally Budapest port completely lost its former significance in the economy of the country. This decrease was largely the result of the Balkan wars of the 1990s that jeopardized navigation on the Danube River; in fact, NATO bombings in Serbia in 1999 destroyed the bridges in Novi Sad and blocked the navigation channel southwards for a long time. This way, the main direction of the Hungarian shipments were impossible to use.

The nadir of the Danubian navigation was the 1990s. The Yugoslav crisis, the embargo, and then the bombings in Serbia from 1999 blocked and

paralyzed the traffic for years, the ruins of the bridges destroyed by bombs and the pontoon bridges established in their stead making navigation towards the Lower Danube impossible or very much problematic.

The opening of the Rhine–Main–Danube Canal also weakened the competitive positions of Hungarian navigation to some extent. Smaller vessels, 500–1,500 tonnes self-navigating ships in family businesses transport on the Danube River, under Western European flags. On the other hand, the volume of shipments has increased, so there is a clearly visible demand for inland navigation in the new millennium.

Table 2: Change of the volume of goods transport on the Danube River, 1950=100%

	1950	1960	1970	1980
Romania	100	209.2	477.2	1453.8
Ukraine	100	295.3	762.1	1,071.3
Bulgaria	100	349.6	1,193.1	1742
Serbia Monten.	100	326.8	909	1459.6
Hungary	100	135.6	260.6	307.5
Slovakia	100	323.3	743.6	624.1
Austria	100	372.5	435	437.4
Germany	100	243.5	300.5	241.3
Total	100	248.8	536	792.5

	1990	1995	2000	2005
Romania	985.2	752.2	676.7	1,129.7
Ukraine	1,227.9	364	251.4	606.8
Bulgaria	789.3	110.8	406.5	630.1
Serbia Monten.	1064		437.9	702.2
Hungary	357.3	86.7	88	146.2
Slovakia	786.4	201.8	142	159.5
Austria	451.5	392.5	517.1	536.5
Germany	214.1			
Total	687.8	232	343.6	510.2

Source: by the authors, based on Donaukommission 2008

Today, there are several ships navigating on the Danube River, that do not belong to the Danubian states. The opening of the Rhine–Main–Danube Canal allowed Western European companies to transport in the international competition, so we do not have a concise picture of the whole stock of ships navigating on the whole of the river. Under the flags of Danubian states (Table 3) there was a Danubian fleet of a total of 3,916 ship units, out of which 427 self-navigating motor vessels, 300 tow-boats, 418 pusher barges, 855 trailed barges and 1,916 pushed barges in 2009. These figures have slightly increased in the recent years, but still lag

significantly below the level of the 1980s, when a total of 4,675 ships navigated on the Danube River under flags of Danubian states. It is interesting that the number of ships decreased compared to the situation three decades ago, but their transport capacity did not. Their carrying capacity was 3.8 million tons in 2009, which is slightly over the figure of 1980 (we have to admit, on the other hand, that the recent figures do not contain the values of the Austrian and German fleet).

Table 3: Fleets of the Danubian states

	1962		1980		2000	
	Number of units (pcs)	Carrying capacity (tonnes)	Number of units (pcs)	Carrying capacity (tonnes)	Number of units (pcs)	Carrying capacity (tonnes)
Romania	353	259,018	1,484	918,591	2097	1,777,939
Ukraine	436	386,440	653	932,314	616	809,134
Bulgaria	100	68,822	316	323,936	303	325,754
Serbia	1,188	430,374	1,244	761,282	681	579,358
Croatia					190	99,616
Hungary	429	206,023	460	299,348	182	196,624
Slovakia	298	124,054	223	218,948	257	347,370
Austria	167	226,046	214	195,790	190	232,403
Germany	171	106,391	81	48,931		
	2005		2009			
	Number of units (pcs)	Carrying capacity (tonnes)	Number of units (pcs)	Carrying capacity (tonnes)		
Romania	1,287	1,526,432	1,412	1,613,931		
Ukraine	678	987,412	679	959,880		
Bulgaria	280	315,703	303	347,678		
Serbia	622	539,968	571	503,955		
Croatia	188	86,866	203	95,805		
Hungary	532		481			
Slovakia	267	305,341	213	237,679		
Austria	n.d.	n.d.	n.d.	n.d.		
Germany	n.d.	n.d.	n.d.	n.d.		

Source: by the authors, based on Donaukommission 2008 and 2010

The most important change for the towns can be seen in the transformation of the traffic. The most important destination is not the industry of the Danubian towns any longer; it is mainly transit traffic that shows an increase. It means that the role of the Danube River is strengthening again, but mostly as an eastern gateway of the EU and not as an internal economic link.

The changing features of the Danubian towns (1989–2010)

As regards the Danube towns in the Hungarian section, we can see a sort of renewal after the systemic change that has compensated the decline of the former industry. The most successful cities of today's Hungary are situated on the bank of the Danube River, although their present development has little to do with the river or navigation. The structural changes concomitant with the systemic change shocked these towns only temporarily.

Budapest as the capital city of Hungary has had the most significant capital absorption capacity in the new economic system. It experienced the systemic change with a relatively competitive

economic structure, anyway, so the capital city can consider itself as the biggest winner of the transformations. A strong suburbanization process started around the capital city, and although Budapest lost some of its population, its environment increased considerably. In the suburban zone, the number of the population in Danubian towns (Vác, Visegrád, Érd) and villages increased, due to their touristic and high prestige residential functions. The traditional economic centres (Győr, Komárom, Esztergom) became the most important Hungarian destinations of foreign direct investments on the basis of automotive industry and electronics (AUDI, Suzuki, Nokia). Győr has reached again its historical position; it has become the second most important industrial city of Hungary, after Budapest. Downstream of Budapest, the centres of energetics sector are still flourishing (Százhalombatta, Paks). Dunaújváros as a typical socialist heavy industry centre has found its place in the new system as well, unlike many of its Hungarian and foreign counterparts. Today there is a large capacity motorway bridge across the Danube at Dunaújváros, as part of a would-be east–west motorway. This is a transport element of basic significance for the Hungarian spatial structure divided by the Danube River, which has improved by far the transport situation of Dunaújváros. The proximity to Budapest and its function as a new transport centre make Dunaújváros one of the most dynamic points of Hungary. South of Dunaújváros, however, right to the border with Serbia the economic possibilities of the Danube towns have worsened. The construction of the new bridge decreased the role of the typical bridge towns (Dunaföldvár, Baja). A significant economic power south of Dunaújváros is represented by the nuclear power plant of Paks, only.

An interesting part of the restructuring process is the fact that former industrial towns on the Danube River (Győr and Dunaújváros) have become higher education centres by now. These cities had no such function before, but now they are among the most important university centres in countryside Hungary.

Following the structural changes that took place after 1989, the economic evolution of settlements in the Romanian sector of the Danube took up a negative course. The causes behind this process are:

- the general decline of the Romanian economy, with direct effects on the depleted volume of goods transited on the Danube and the industrial production capacity of units located in industrial-harbour centres;
- the disintegration of COMECON resulting in the loss of some important markets, a situation that affected especially the export-oriented industrial branches, mainly metallurgy;

- the dramatic decrease of investments in industry that hindered the development and modernization of this sector, and maintained low labour productivity levels; and
- the intensification of environmental protection that was a pressure element for the polluting industries (chemistry, metallurgy), forcing them to limit production in order to respect acceptable pollution standards.

The slowdown of industrial activity in the area also reduced river traffic, as did the war that broke out in the former Yugoslavia and the embargo that followed it. Thus, both the quantity of goods and the distances covered decreased in the Novi Sad sector of the Danube, where bombarded bridges blocked navigation.

The Danube facilitates the communication between the main economic systems, with border areas becoming dynamic points of convergence of the free economy. The analyzed space, although it greatly transformed during the last decades of the 20th century, is extremely rural, urban areas being fewer and scattered. The share of the active population and its professional structure shows employment to stand between 29% and 76%, but most of the times the percentage is lower than the all-country average value, with the lowest values in the highly rural countryside. Moreover, the low percentage of industrial population in the village areas supports this assertion.

Taking into account the structure of the active population, some functional types of settlements in terms of development and location can be outlined:

- ship-building: Orșova–Turnu Severin, Giurgiu, Oltenița, Galați, Brăila and Tulcea;
- iron and steel industry: Zimnicea, Călărași and Galați;
- chemical industry: Turnu Măgurele, Oltenița and Tulcea;
- agriculture.

With the change of the socio-economic system after 1989, the structural reform of the Bulgarian economy began. All economic shortcomings that were accumulated in previous periods quickly showed up. Therefore, a reassessment of the current specialization and of the scale of production had to be made; new, high-tech, market-oriented, innovative productions had to be launched. Many enterprises were shut down because of their low economic effectiveness. The main reason for that, as mentioned above, was the fact that most of those enterprises were branches of various state-owned enterprises. The activity of those branch-firms was not in accordance with the local potential and the local resources, another problem was the underassessment of the existing infrastructure etc. Therefore, all those small enterprises were supported by state subsidies. Their closure, however, played a negative role in the

braking of the connections that used to exist within COMECON (the cooperative production, the so-called socialist division of labour, trade exchange etc.), while the USSR practically closed its market for Bulgarian products. Thus, in the years following 1990, the transport potential of the Danube River is not utilized on a full-scale.

Another negative factor is that the Danube River represents a border and as such forms a relative isolation and hinders the overall development of the Danubian urban settlements in Bulgaria. Their economic degradation during the years of transition has led to population outflow and population number decrease (Fig. 2).

The economic activeness coefficient (ratio between work force and the population aged 15 + years) in the Danubian districts is higher than the national average: 53.6% as opposed to 52.1%. However, because of population ageing, the coefficient has very low values in some of the towns in the discussed area, such as Dunavtsi (22.3%), Slivo Pole (37.1%), Trasrenik (37.1%), Gulyantsi (38.8%) and Bregovo (39.2%). The relative share of the employed persons in the Danubian towns is 85% – i.e. practically the same as the national average, which is 85.1%. That share is lower in Nikopol, Dolna Mitropoliya, Glavinitsa, Valchedram, Gulyantsi and Lom, which are basically located in areas with less developed industry and are mainly agricultural.

The employment coefficient (ratio between the number of employed and the number of the population aged 15 + years) in the Danubian cities is 45.5%, which is by 1 percentage point higher than the national average – 44.4%. In towns such as Dunavtsi, Gulyantsi and Nikopol, the coefficient has very low values, while in towns with better economic profiles such as Kozloduy, Ruse, Silistra, Vidin, Tutrakan and Marten, the employment coefficient reaches the highest values in the Danubian region.

Case study: oversized industrial development and urban space organization in Galați

In 1961, the construction of the biggest iron and steel works started in Romania, in line with the most modern ones in Europe at that time. It was a typical Soviet-type specimen of industrial mammoth, belonging to the second generation of profile works built on empty space like Nowa Huta (Poland), or some of the Ukrainian ones. Just like at Nowa Huta, its technology dates to the 1960s and 1970s, employing 42,7000 people in 2001 and 16,500 in 2008. Similar industrial units were at Košice (Slovakia), Eisenhüttenstadt (the former GDR) and Kremcikovi, west of Sofia (Bulgaria), of much lower capacity than the Galați one.

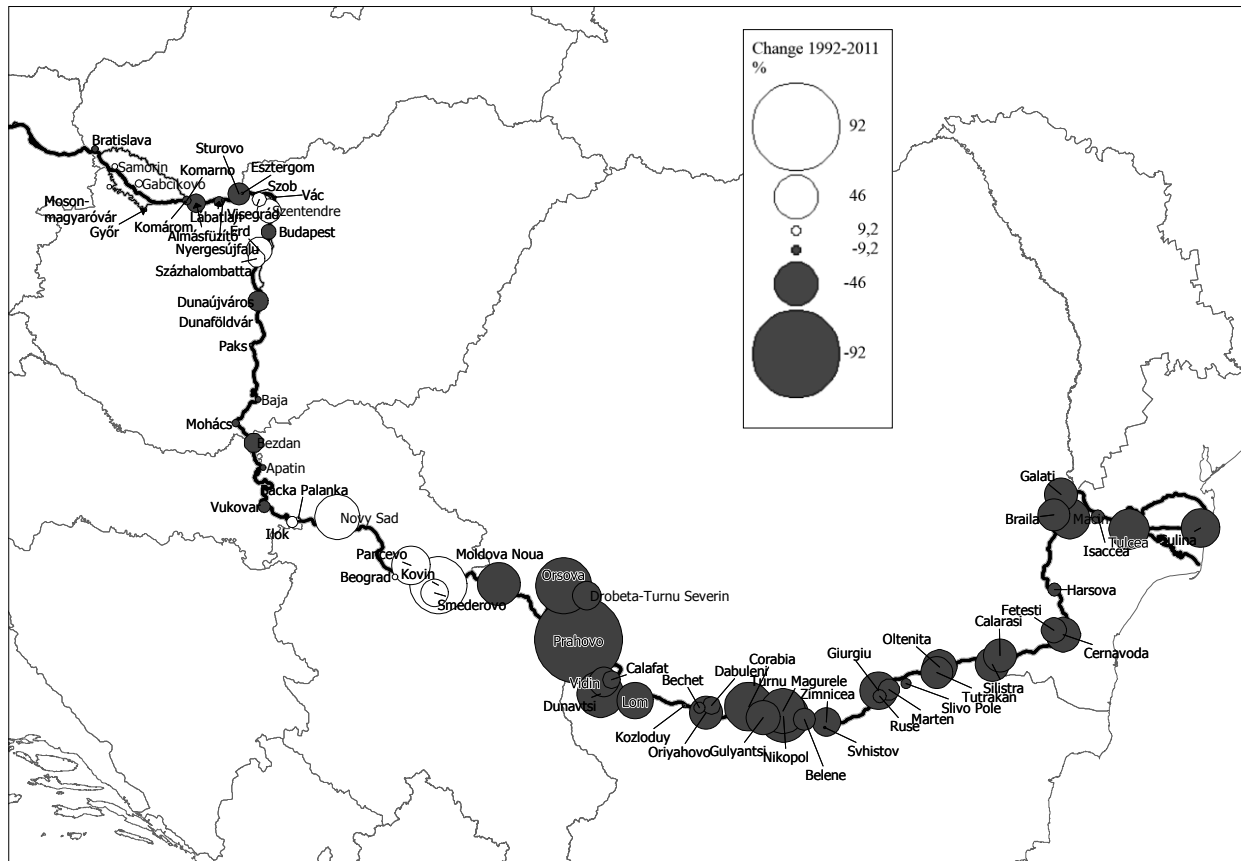


Fig.2. The population change of the Danubian cities during the last two decades

Sources: by the authors, map: by Hardi

As political and economic subordination to Moscow was growing, the Romanian leadership decided to build a big iron and steel works in order to supply the Romanian machine-building industry with raw materials and also have export availabilities. The new investment had to be located in a port town having the infrastructure and conditions to convey huge quantities of raw materials and semi fabs. Furthermore, relations with the COMECON implied massive long-term imports of iron ore from Krivoy Rog and coke coal from the Donets Basin (Ukraine). So the location had to be as much as possible in a big port town at the maritime Danube. Since the town already had an industrial profile (a big ship-yard and some rolling stock repair shops, as well as other machine building units which required great quantities of plate and other structural shapes), Galați was considered an optimal site for this investment; moreover, since it was a regional centre, it was assumed that it could polarise a large geographical area, including the present counties of Galați, Brăila, Vrancea and the eastern half of Tulcea.

Thus, the building of the biggest industrial unit in Romania was really a turning point in the history of

Galați, a town with 107,248 inhabitants in 1961 (12th rank in the urban hierarchy). The steady enlargement of the Works with a 40,000 workforce in 1989-1990, had an overreaching importance for the town's demographic evolution and the dynamics of its housing stock.

As the town's population trebled in a lapse of only 30 years, its built-up perimeter suffered major disturbances, especially the western half of the town (Mazepa, Țiglina, Aeroport, Dunărea, Siderurgiștilor, Micro 17, Aurel Vlaicu, etc.) where new apartment-block districts were established.

Against the background of an economic slowdown at national scale, the steep demographic decline of large cities like Brașov and Cluj-Napoca made Galați mount two seats in the urban hierarchy during 1990-1993 period. The first massive lay-offs took place in 1999 (Government Order 98), redundancies affecting 3,456 workers, the majority of whom were skilled labourers, with little retraining opportunities, e.g.: locksmiths – 22.3% out of all laid-off (769 people); electricians – 10.2%; carbon producers – 7.7%; cutters, welders – 5.8%; crane operators – 5.1%, whereas lay-offs in the administrative and financial-accountancy sectors was

really insignificant. At the same time, the closing down of some inefficient units (battery 8 of the coke chemical unit) and the imminent prospect of the spare parts and Iron and Steel Repair Plant (UPSRS) to be segregated from the Works production flux made most of the workforce of these two units redundant. As a result, the flow of commuters from the country's rural area was diminished.

In November 2001 the privatisation contract was signed, LNM Holdings BV, a Company of the LNM Anglo-Indian group, the fourth biggest steel producer in the world, buying it. Striving to make the activity efficient and in the wake of EU negotiations on the competition chapter, redundancies went on. In 2004, the Company continued to be the leader among top private companies in Romania, with a turnover of 1.08 billion USD, the production increased from 3.7 million tons of steel in 2001 to 4.6 million in 2004, exporting about 66% of its output. In 2007 the Iron and Steel works in Galați produced 4.4 million tons

of fluid steel, contributed by 1.33% to the GDP and was the country's major exporter (3.8% of the overall export volume).

The economic-financial recession which began in mid 2008 severely affected Romania's iron and steel sector, part of the installations being disconnected as demand in Europe's markets fell and technological unemployment would hit, by rotation, all its 12,500 employees.

The Iron and Steel works play a major role in the activity of the other industrial units of Galați: e.g. the Damen Shipyard and the Massive Plate Rolling Mill depend directly on the Sidex by-products, the Ore Sorting Station being its main supplier. It follows that the industrial evolution of the eastern city zone (port activities and shipyard) is intimately related to the Sidex raw material supply. As of April 1994, the existing infrastructure allowed for the Galați Free Zone commercial and warehouse profile, with two platforms totalling 135.98 hectares, to come into being (Fig. 3).

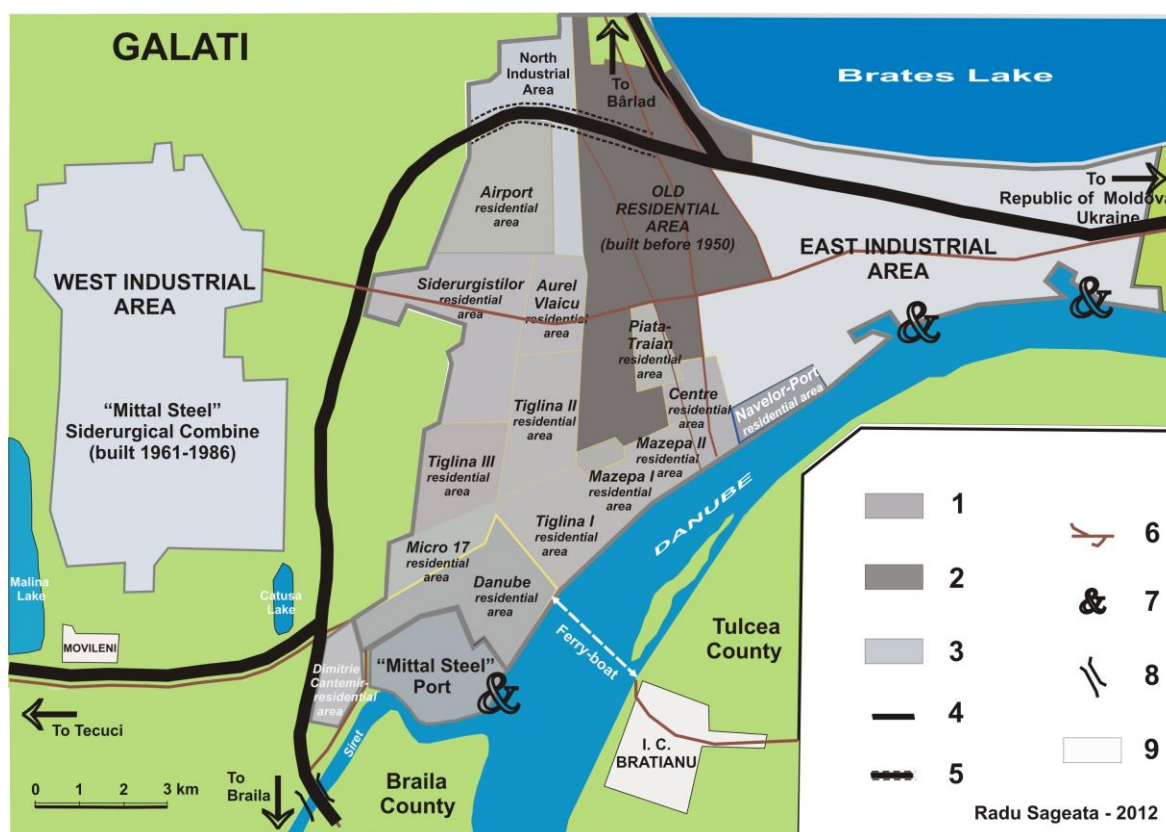


Fig. 3. Galați. Iron-and-Steel Works and its impact on the residential area

1. New residential area, 2. Old residential area, 3. Industrial areas, 4. Railway, 5. Railway tunnel, 6. Street network, 7. Harbours, 8. Bridges, 9. Rural settlements. Source: Radu Săgeată

Experiences

The Danube towns have undergone a fundamental transition in the last decades. We could see the birth of a row of industrial towns during the years of socialism, built on the Danube River as a

transport corridor. The river had a dominant role in the shipment of raw materials, connecting the economy of the Southeast European and Central European areas to the Soviet (Eastern European) region. These towns had to face a triple problem after the systemic change:

- the structural crisis of heavy industry,
- the general economic decline of the Central European and Southeast European states, and
- the disintegration of the Eastern European space, the Soviet Union.

The situation was only slightly worsened by the fact that the Yugoslav crisis resulted in a physical and political blocking of navigation as well. The combined effect of all these factors was that all the towns, with few exceptions, faced serious difficulties and their economy and population showed a downward tendency.

The change in the number of population is a very good indicator showing that those towns were capable of economic development and thereby keeping or increasing their population; they were

- situated in traditional industrial zones with favourable geographical position (Győr, Komárom, Esztergom, Novi Sad, Smederovo), or

- at high level of the urban hierarchy (capital cities or towns located in the agglomeration of capital cities— Samorin, Gabčikovo, Budapest, Belgrade, Pančevo).

In our opinion, in the future, urban economic development connected to the Danube River will take place in those areas where the transport points suitable for new transit functions can be found. These are primarily the big port towns of the Delta area and their agglomerations (Braila, Galați), and also the major reloading points and multimodal ports under development. Those Danube towns where modern economy can be located on water have also a good chance. This is especially possible in the energetics sector, where water is either the energy carrier itself or where the raw materials of energy production are transported on water (e.g. bio-fuels), or where a larger amount of industrial water is necessary for production (traditional power plants). A supplementary activity to all these may be tourism, with different character by Danubian sections and settlement types, and whose main task (in addition to income generation) is in the strengthening of the identity.

Our paper analyzed the Danube-related development of towns at the middle and the lower reaches of the Danube River, and their transformation over the last decades. We can see that this development gained momentum in the second half of the 20th century, but now we can witness a major decline. Many towns have already managed to break out of this decline, but this recovery was only indirectly due to the Danube River. We cannot say that this will not change in the future. Transit shipments, energetics and tourism may rearrange the characteristics of the system of Danubian towns, but this development is in its infancy for the time being. This may be the point where the development policy of the European Union can contribute to the revitalization of these cities.

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