APPROACH TO THE PLANNING AND DEVELOPMENT OF THE DANUBE WATERWAY IN SERBIA

Saša Milijić, Nikola Krunić, Marija Maksin Jasmina Đurđević
Institute of Architecture and Urban/Spatial planning of Serbia
Bul. kralja Aleksandra 73/2, 11000 Belgrade, Serbia, phone:+381-11-3207-300.
sasam@iaus.ac.rs, nikola@iaus.ac.rs, maja@iaus.ac.rs, jasmina@iaus.ac.rs

Abstract

According to the relevant national legislation, for the Danube through Serbia it is provided the preparation of spatial plan for special purpose area, as an instrument for the development and management of this part of the Pan-European waterway Corridor VII. Approach in the development of this specific category of the spatial plans, as well as experience in the implementation, are discussed in this paper. Key determinants of the Spatial plan were aimed at: achieving a higher level of quality of the waterway and attendant facilities (ports, harbors, marinas, etc.), intensive development of river transport according to the international standards, environmental protection, especially environmentally sensitive habitats in the Danube corridor, development of local communities in the coastal areas, creating the conditions for the implementation of development interests within the transportation, economic, cultural and other forms of integration into European development trends. The purpose of this paper is to highlight the need to create conditions for the intensifying the development of inland waterway transport on the Danube and liabilities of integrated development and protection of the Danube corridor, in accordance with European strategies and management plans. The basic hypothesis is that the Danube waterway cannot be the only engine of the economic growth and development in the Danube region in Serbia. In the way of contribution to economic growth there are many physical and institutional constraints and development conflicts. This paper also pointing to the possibility for overcoming development constraints, especially with aspects of the rational development and utilization of the waterway corridors, protection and presentation of natural values and cultural heritage.

Keywords: Danube waterway corridor in Serbia, ecological, cultural- and tourist corridor, spatial planning.

1 INTRODUCTION

The objective of the Spatial Plan elaboration was the affirmation of the Danube as a waterway of international importance which represents the primary resource of the waterway network on the territory of the Republic of Serbia. The immediate purpose of the elaboration was the elimination of limitations on several sections of the waterway which affect the navigation and development of accompanying facilities of the waterway.

The Spatial Plan for the Special Purpose Area of International Waterway E80 – Danube – Pan-European Corridor VII (hereinafter Spatial Plan) is the first plan of its kind elaborated for the whole Danube section in Serbia1 (Map 1). Preparation and adoption of this Plan is part of the implementation of the Spatial Plan of the Republic of Serbia ("Official Gazette RS", No. 88/10). In addition, the Spatial Plan is part of the implementation of regional spatial plans in the Republic of Serbia, with the necessary harmonization with other national development documents and strategies.

The issues relating to the planning and development of an international infrastructural corridor (Milijić et al., 2003), especially the waterway such as the Danube, represent a particular challenge and require a multidisciplinary approach (Perišić et al., 2003). The starting point was the analysis of several national laws which regulate the field of the waterway development and functioning. Additionally, due to a number of various land uses, it was necessary to define the principles for relativization and harmonization of different conflicting interests. The Danube is the only pan-European water corridor and the most relevant waterway which (along with the Rhine and the Main) links the Black Sea and the North Sea, representing the essential part of the inland waterway network. The whole section of the Danube which runs through the territory of the Republic of Serbia is navigable (the total length is 588 km, which account for a quarter of the whole waterway length of about 2415 km in Europe) and has the importance of the VIc category international waterway on the section from the state border with the Republic of Hungary to Belgrade, i.e.

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VII category international waterway on the section from Belgrade to the state border with the Republic of Bulgaria.


The cross-border cooperation important for the Spatial Plan area is realized within: IPA cross-border programmes between Serbia and Romania, Bulgaria, Hungary and Croatia, cross-border cooperation of the areas with natural values (especially within the activities on the establishment of the cross-border biosphere reserve Danube-Drava-Mura, Carpathian areas, network of the Danube parks), European Green Belt (Lower Danube green corridor along the border with Romania), European cultural route (Danube route) and Euroregions („Danube-Kris-Moris-Tisa”, „Danube 21”, etc.) (Maksin, 2011; Márkus and Šakić, 2011; Danube Delta Biosphere Reserve Authority, 2011; Baumgartner and Blumer, 2012)

2 METHODS

The Danube corridor in Serbia involves parts of the primary development axis with the highest concentration of the population and economy. Crucial points of development are oriented towards: reaching a higher degree of competitiveness and quality of the Danube waterway, i.e. accompanying facilities and structures in the function of navigation safety etc; enabling faster development of the Danube waterway according to international standards; achieving the balance between the river transport and other forms of transport; creating preconditions for the fulfillment of the interests of the Republic of Serbia in the area of pan-European corridor VII within traffic, economic, cultural, ecological and other kinds of integrations.

Despite relatively favourable natural conditions, the river transport in Serbia has not so far been given enough importance which it is due to have owing to its economical and ecological advantages. The spatial distribution and number of ports available for international transport is sufficient. Nevertheless, the network of passenger harbours and marinas, which do not meet all the conditions set by national and European regulations, is underdeveloped and low quality. Moreover, it is not sufficiently adapted to the spatial distribution of attractive tourist locations, above all, locations of cultural and natural heritage. Negative impacts on the environment have been observed (mainly in connection with communal and ship waste), and these have to be, by means of certain measures and activities, reduced to a minimum. In these conditions, the first objective of the Spatial Plan is to offer strategies of development and spatial planning solutions which will enhance the position of the Danube corridor and the surroundings for long-term economic development, as well as the planning basis for more rational and efficient urban and rural restoration and improvement of ecological conditions for living in the endangered parts of the Danube region.

The Spatial Plan defines special purposes in the Danube corridor and its immediate surroundings, those being (Milijić and Đurđević, 2012): a) Pan-European river transport corridor VII and other water management infrastructure, b) natural, cultural and tourism values (the most attractive ecological and nautical sections of the whole watercourse), c) basins and zones of energy and mineral resources, d) transnational and main arterial routes infrastructural systems, e) border crossing, border area etc.

In the corridor of the Danube waterway in Serbia, there are, apart from water management infrastructure, segments of natural, cultural and tourist values and other special purposes, as well as riparian

2 Taking into account an exceptionally high concentration of natural and cultural heritage in the Spatial Plan area and its immediate surroundings, the application of the following international conventions was also important for the spatial planning and development of Corridor VII: Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) based on which the Emerald Network and Natura 2000 network have been developed, Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), Convention on Biological Diversity, Convention on Wetlands (Ramsar Convention), Convention Concerning the Protection of the World Cultural and Natural Heritage, European Landscape Convention, Framework Convention on the Protection and Sustainable Development of the Carpathians, Conventions for the Protection of the Architectural Heritage of Europe, European Convention on the Protection of the Archaeological Heritage, Resolution on Cultural Routes of the Council of Europe, etc.
parts of cities and other settlements. Planning solutions have been determined with a greater degree of details for the corridor of the Danube waterway and parts of the corridor of infrastructural systems which intersect the waterway corridor at several places.

This Spatial plan have an integrated and problem-solving approach to the planning of the development and management of the planning area and contain: a complex assessment to the situation and position, potential and limitations of the development in the waterway corridor, goals and vision for spatial development and management, analysis of the impact of the waterway to the development of the Danube corridor, criteria for the solving of conflicts, planning solutions, guidelines to implement the plan with priorities, etc. The aim of the Plan is a contribution to the planning, development and protection of the Danube, primarily as the waterway, but also as a water, environmental, cultural, tourist and trans-border corridor (to the Republic of Croatia and to the Republic of Romania). (Milijić et al., 2014).

Map 1. Danube area in Serbia (background map – ArcGIS Base maps).

Spatial plan includes: 1) Waterway sections included in the general plans of the cities of Novi Sad, Pančevo, Belgrade and Smederevo, totalling approximately 81 km in length and 300 m - 3700 m in width. These sections encompass direct buffer zone and indirect buffer zone, which include accompanying facilities of the waterway and the area with the minimal width of 50 m from the embankment foot in all protected areas, sloped walls and bank revetments. Waterway sections going through the territories of municipalities and cities of Apatin and Bačka Palanka have the length of about 12 km and the width of 400 m - 1500 m. 2) Sections of waterway corridor (excluding previous sections in cities and urban settlements) the length of which is around 495 km and the width of which is 150 m - 5200 m, which include the route of waterway with direct and indirect buffer zone. 3) The zone of direct influence of the waterway corridor. This zone comprises the space between the waterway and certain sections of highway infrastructural systems, along with the routes and buffer zones of their corridors. The corridors of these systems are in a direct physical and functional connection with the corridors of the waterway.

In addition to the waterway route, the Spatial Plan involves direct and indirect buffer zones. Direct buffer zone, along the section of the waterway corridor outside cities and urban settlements, encompasses part of the floodplain: aquatorium and riparian area, ridges - river islands and branches which are occasionally flooded, and the border of which is the level of water incise the height of 3 m from the low
navigation level (hereinafter: LNL), including protective regulatory structures and water structures aimed at the waterway development (quay and flood walls), as well as structures the purpose of which is safe navigation down the waterway.

Indirect buffer zone, along the section of the waterway corridor outside cities and urban settlements, includes part of the floodplain (high water Danube bed with riparian area), that is to say the inundated area, which includes the zone: between the water incise at LNL+3m (of direct buffer zone) and the border (flood) level of the water bed for the 100-year flood in the areas where no structures for the protection from adverse effects of water (undeveloped inundated area) have been built; and between the water bed for LNL+3m and the internal (protected) foot of the main embankments with their structures built for flood protection (developed inundated area), as well as the zone the width of which is minimal 100 m from the foot of main embankments on the internal protected side, in addition to part of the water and riparian area with accompanying facilities of the waterway which are under the special regime of development and usage (harbours, winter harbours, shelters, ports, marinas, terminals in contact with the waterway, accompanying services and other structures which are in the service of water transport and users of the waterway). Indirect buffer zone along the section of the waterway included in the general plans of the cities of Novi Sad, Pančevo, Belgrade and Smederevo encompasses accompanying facilities of the waterway and the zone the width of which is minimum 50 m from the embankment foot in all protected areas, as well as sloped walls and bank revetments.

Part of the area of the pan-European river corridor VII belongs to the Danube development axis of the Republic of Serbia which has a wider European importance, not only in the navigation and economic sense, but in all other senses as well3 (Krunić and Žnidaršič, 2012). The values of the Danube from the aspect of tourist valorization are important in terms of: the wealth of motives, ecological conservation, natural and cultural heritage values and accessibility to destinations. The Danube is also used for the navigation of smaller navigation vessels and fishing boats, and possesses several attractive segments: aquatoria with riparian areas which are particularly characterized by marshes and swamps, the Djerdap Gorge, as well as plenty of suitable locations for navigation and various tourist and recreational purposes.

On the basis of national regulations related to the environmental protection, international conventions and programmes and other documents, natural values in the Danube corridor have gained the status of protected natural areas. The total surface of the protected natural areas in the Danube corridor in Serbia is 1072 km², out of which 77.4 km² encompasses the Danube waterway (230 km of the bank length belongs to protected areas). In a broader sense, the cultural heritage of the Danube corridor is an integral part of the European cultural heritage, which represents a particular potential for the establishment of greater international cooperation. Apart from the importance for the cultural development, this is also a potential for the development of cultural tourism, by means of the inclusion into pan-European cultural routes (Maksin and Milijić, 2012). The issue of environmental protection is oriented towards maintenance and enhancement of the Danube water quality (in the sense of biological, physical and chemical parameters), as well as the ecological status of the air and land in the riparian area.

The principles of sustainable development of the waterway corridor defined by the Spatial Plan are based on:

a) development of crucial technical and technological sub-systems of the river transport, b) integration with the environment and other forms of transport (development of multimodal transport terminals), c) orientation towards users, providing availability, increasing competitiveness, transport efficiency and attractiveness of the river transport, d) development which is harmonized with the plans of neighbouring countries – EU, e) intensification of cross-border cooperation of Serbia with Croatia and Romania with regard to the solving of issues imposed by the development, protection and planning of the waterway on the joint waterway sections, f) relativization of conflicts in development of the waterway and other aspects of water management on the principles of rational use, spatial planning and environmental protection, g) development of nautical and other ecological forms of tourism, with improvement and sustainable use of natural and cultural heritage in the riparian area, etc.

3 Although there is a clear consensus of experts with respect to the importance and necessity of planned treatment of the Danube region in Serbia, it is less clear what its spatial scope should be. There have been different views of the spatial scope, which have had their impact on the spatial planning treatment (Derić, 1998; Stojkov et al. 1998; Đorđević et al. 1998). The first concretization of the spatial scope of the Danube region in terms of the planning treatment was proposed in the elaboration programme of the Spatial Plan of the Danube-Sava River Belt, which determined two levels of territorial scope and planning treatment (Perišić, 2000), those being the wider one (administrative units whose territories border or encompass the Danube and Sava rivers) and the more narrow one (municipalities and cities whose territories border or encompass the waterway).
3 RESULTS AND DISCUSSION

In order to define the concept and planning solutions of sustainable development and protection in the Danube corridor in Serbia, the Spatial Plan has identified 8 essential conflicts and established ways of their relativization (EEA, 2012). Five most important of these are presented below for the needs of this paper (Table 1). This is, above all, related to the impacts of the Danube waterway and other water management infrastructure, and partly those of transport, tourism, agriculture, industry and other aspects, on the sustainable use of natural and man-made resources.

Table 1. Key spatial conflicts and starting points and principles for their solving

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<tr>
<th>Conflict</th>
<th>Starting point</th>
<th>Principles of relativization:</th>
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<tr>
<td>Necessity of the river transport development and morphological and functional limitations of the Danube watercourse</td>
<td>Elimination of „bottlenecks“ on 24 critical sections of the Danube</td>
<td>• Performance of regulation works on critical sections of the Danube in order to achieve the prescribed class of the waterway; and • Cooperation with the Republic of Croatia for the purpose of maintenance of the common section of the waterway;</td>
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<tr>
<td>Development of the waterway and protection of the environment, natural and cultural heritage</td>
<td>Overcoming the negative impact of the waterway on the environment and optimization of the benefits from these two activities; revitalization of habitats and reestablishment of the river contact with the old river branches in separate projects.</td>
<td>• Adherence to the water regimes in flooded parts of protected areas and preservation of the natural structure of the river banks • Increase of surfaces under water – achievement of good ecological status; • Preservation of fish hatcheries and conditions for migration of ichthyofauna; • Restoration of degraded areas occurring as a consequence of the waterway development; • Limitation of construction works; • Realization of new development potentials of the waterway and complementary activities (nautical tourism etc.) on the conservation and enhancement of natural and cultural heritage; • Determining responsibilities for the caused damage with respect to the degradation of water quality; • Allocating part of the profit from the waterway development to financing programmes and projects of protection and presentation of natural and cultural heritage; • Elaboration of the assessment related to the waterway impact on the environment for the purpose of defining measures and activities for solving conflicts of the waterway and protection.</td>
</tr>
<tr>
<td>Development of economic activities in the wider area of the Danube corridor and protection of the environment and natural values</td>
<td>Overcoming conflicts between the economic development and environmental protection and optimization of benefits from these two activities.</td>
<td>• Stopping inadequate treatment and disposal of industrial waste; • Defining registry of industrial pollutants; and • Defining measures of compensation regarding the industry with respect to the environmental protection and harmonization with the principles of the EU industrial policy;</td>
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<tr>
<td>Interests of water management and agricultural activities</td>
<td>Development of agricultural production based on efficient functioning of water management systems (protection from external and internal waters, use of waters for irrigation and protection of waters from adverse consequences of agricultural activities).</td>
<td>• Provision of more regular and efficient maintenance of drainage canals; • Reduction of organic pollution; • Upgrading of dikes and accompanying structures; • Provision of adequate compensation to local population for the flooded agricultural areas.</td>
</tr>
<tr>
<td>Interests of water management and tourism development</td>
<td>Overcoming the negative impact of water management on the development of nautical tourism.</td>
<td>• Establishment of recreational waterway and selection of protected locations for marinas, harbours and berths; • Tourism interest for the conservation of the Upper Danube wetlands as a unique ecological oasis and attractive tourist resources of the Lower Danube region.</td>
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Realization of these principles implies: maximum harmonization of the waterway development concept with the regimes of protection of natural and cultural values in the function of the conflicts relativization; realization of the waterway structures in line with the ecological capacities with the necessary neutralization of potential negative impacts on the environment and multifunctional land use oriented towards several effects and benefits (international waterway – small waterways for recreational navigation – nautical tourism – presentation of natural heritage) etc. These principles were performed throughout the spatial planning process, but they also should be performed during the implementation of the Spatial Plan.

Map 2. Danube waterway corridor in Serbia and potential zones/areas of spatial conflicts (background map – ArcGIS Base maps).

4 CONCLUSIONS

Within the policy of the EU accession process, there is a necessity to create conditions for more intensive development of river transport and safe navigation on the Danube in Serbia, as well as for the integration of river transport and other kinds of transport. The Danube corridor, which enables integrated freight transport, in terms of the interest shown by the EU in the future activities aimed at the improvement of the waterway in the territory of the Republic of Serbia, will represent a significant responsibility of Serbia. The Spatial Plan establishes conditions for the quality improvement of the Danube waterway. It defines principles for the solution of conflicts between the Danube waterway and other water management infrastructure, as well as other aspects of land use (transport, tourism, agriculture, industry etc.), thus creating preconditions for the sustainable use of natural and man-man resources in the Danube waterway corridor.

Spatial integration of Serbia into the European surroundings is being performed, and will be performed, on several levels – at the European Union level, transnational level of South East Europe, cross-border and trans-border level with local and regional territorial units of neighbouring countries. The basis for all the stated levels of integration will be landscape units, natural systems (water and mountain systems), infrastructure, natural and cultural heritage, environmental protection, socio-economic, cultural and other connections which contribute to the sustainable spatial development and integration of the Republic of
Serbia in the European surroundings. In the application of international and European conventions, European strategic documents and directives, the greatest direct influence on international and cross-border cooperation regarding the sustainable development of Corridor VII will have the implementation of the EU Strategy for the Danube Region and implementation of the Danube River Basin Management Plan.

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