FACTA UNIVERSITATIS
Series: **Working and Living Environmental Protection** Vol. 13, N° 1, 2016, pp. 41 - 51

HISTORICAL LANDSCAPE OF IMMOVABLE CULTURAL PROPERTIES IN BRANKOVINA AND FLOOD PROTECTION MEASURES

UDC 614.81:719 (497.11Brankovina)

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Abstract. *The attitude towards the values of cultural heritage is one of the important factors in shaping the character of a place and the character of a cultural and historical ambience. Cultural heritage plays an important role in strengthening the regional and local cultures and tradition with respect to economic and social issues, as well as with respect to the environmental protection regulation. The Brankovina cultural and historical complex – the immovable property of exceptional importance, is an important cultural centre of Serbia which implies an integrated protection of all structures together with the surrounding area. The illegal construction, inappropriate reconstructions and interventions in this area have resulted from a lack of urban planning regulation over a long period of time. Insufficiently developed awareness about the importance of cultural heritage for the development of this area, as well as a lack of clearly defined programmes and measures that would ensure a continuous process of protection, presents a constant threat to the survival of this important heritage. The flood risk problem is much more prominent in this area than in other parts of Serbia due to complexity in the protection of historical heritage and particular ambience qualities. The work on the area development programme which would provide spatial, environmental, economic and functional conditions for future development and protection of this area has started after the adoption of the Decision on General Regulation Plan. The achievement of objectives is moving towards the affirmation, protection and improvement of the Brankovina cultural and historical complex as a traditional cultural heritage, along with planning the new facilities that would be appropriate to the importance of the area, and without environmental consequences.*

Key words: *immovable cultural properties, restoration, spatial and urban planning, flood protection*

Received November 3, 2015 / Accepted May 27, 2016
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1. INTRODUCTION

The Brankovina cultural and historical complex – the immovable cultural property, is a very important cultural centre with preserved authentic historical and material values that is designated as a cultural property of great importance, along with environmental protection. The importance of the Brankovina resources, owing to which this area has received historic landmark status, primarily lies in their cultural, historical, social and anthropogenic values related to: (1) historically important figures and important cultural, social and historical events; (2) protected cultural and historical heritage of great national importance; and (3) cultural and religious institutions that bear witness of socioeconomic and cultural-historical conditions in which the area has developed. The complex of immovable Brankovina cultural property – the monuments of culture and valuable examples of national architecture dating back to the first half of the 19th century in Serbia, are organized in a form of an open-air museum.

The protection of the area within the Brankovina Historic Landmark implies an integrated protection of all structures together with their surroundings. This means that the valorisation and the current-state analysis of cultural heritage is the starting point in overall planning of the activities, where it is of crucial importance to identify the main reasons for its emergence, as well as to again provide the same or similar circumstances in procedures for revitalization and regeneration of the space that would ensure its continuous protection.

The cultural heritage and natural resources of Brankovina are important potentials for the development of cultural tourism and numerous activities that would enable affirmation of cultural and historical values, and also a basis for the restoration of tangible and intangible cultural heritage. Local authenticity, uniqueness of the ambience, different historical layers, local tradition and customs, geographical and ecological specificities of the area, as well as original architectural identity as a whole, are a basis for cultural tourism of Brankovina [1]. The need for an active protection, as well as for building a tourist attraction, is based on unique experience and memory of the place that build the identity of the Brankovina area.

Major guidelines for the protection and sustainable use of cultural heritage in Serbia, as defined in the Spatial Plan of the Republic of Serbia until 2020 [2], relate to the areas containing immovable cultural properties and their surroundings which protection is regulated by legal regulations, planning and strategic documents and rules pertaining to this field. The natural values of this area include: favourable geographical position; preserved ecosystems and low level of air pollution; landscape values regarding the ambience and views; forestland; orchards; meadows and pastures. The General Regulation Plan (GRP) for the village of Brankovina, which the authors had been developing in 2013 and 2014, is an initial document and a basis for directing and managing the local community development, land use, organization and planning of the area.

After devastating floods that hit central part of the Balkans in May 2014 (Fig.1), and in addition to losses of human life, Serbia has also recorded huge material losses including residential and public buildings, infrastructure, movable property, open areas (courtyards, parks and gardens), as well as material values of industry and agriculture and live-stock breeding. Amongst numerous places in Serbia, the wider area of Brankovina was also affected, where the vernacular architecture within the protected area with monuments of culture was particularly threatened. Roofs and attics, walls and ceilings were flood-damaged, basements flooded. Many houses and churches were threatened by landslides.

Although the Plan for the settlement of Brankovina envisages operational measures for systemic flood protection, which will be presented in details in this paper, their implementation has not come into force because at that time the Plan was not adopted.

Fig. 1 The regions of Central Balkans affected by flooding

2. MATERIALS AND METHODS

2.1. The complex problem context of Brankovina and choosing the planning solution methods for systemic revitalization of the area

The efforts of the Cultural Heritage Preservation Institute of Valjevo to fully protect cultural heritage have not been sufficient due to constant pressures, as well as due to consequences of specific economic, social and political circumstances and different forms of intense and uncontrolled construction. Inappropriate reconstructions and interventions in this area have resulted from a lack of urban planning regulations over a long period of time. Insufficiently developed awareness about the importance of cultural heritage for the development of the area, as well as a lack of clearly defined programmes and measures for ensuring continuous process of protection, presents a constant threat to survival of this important heritage. In addition, the main constraints for more efficient protection of natural resources and cultural heritage have occurred due to insufficient promotion of tourism and poor accessibility of natural resources and cultural heritage as a result of poor quality of road network and other infrastructure systems. Due to a lack of hotels, restaurants, commercial and educational facilities and entertaining contents in the complex and its wider surrounding area that would provide additional services to the tourists, the visitors only visit the complex of Brankovina without staying longer in the village, due to which a significant economic development of the area is not possible, except during cultural and tourism-commercial events.

The branched water system in a wider area of Brankovina, besides being one of the basic qualities of this area in terms of ecology and ambience, is at the same time a cause of constant threat of flooding. The area of Brankovina is located in the hills in a wider area of the Rabas river basin and valley, the left tributary of the Kolubara river. The Valjevo subsystem of the Kolubara regional system is a rounded off water management subsystem considered as a single technological and systemic hydro-technical entity. A specific hydrological problem lies in a pronounced temporal variation of surface water, which is the greatest and the most unfavourable in Serbia, characterized by short-term flash floods caused by torrential rains with very rapid concentration of flood wave peaks, followed by a very long periods of low precipitation. For this reason, the requirements for the remediation of settlements and prevention from unfavourable anthropogenic influences in this area are significantly stricter than in other parts of Serbia. Thus, the complexity of flood protection is increased, primarily through a strict preservation of the prescribed floodplain protection regime. Because of a specific genesis of high water in the Kolubara river basin, the large and destructive flash floods occur. They threaten the downstream areas and, as the sites suitable for building the settlements are threatened by different forms of erosion and instability, it is necessary to build hydrotechnical structures for the protection from erosion and stormwater.

In addition to the mentioned problems in the protection of cultural heritage and illegal construction, as well as inadequate tourism promotion and poor financial possibilities, the need for drawing up a planning document that would offer a realistic basis for eliminating numerous shortcomings in using the space also relates to the constant threat of flooding. Depending on the problem, the choice of planning methods comprises the procedure of a phase revival of the place divided into historical centre and planned Village Community Centre with a complete functional organization, on the one hand, and implementation of specific flood protection measures – through a natural regulation of the existing watercourses and creation of new acquatoria as ecologically non-invasive and sustainable flood protection measures, on the other hand.

2.1.1. Revitalization of cultural heritage

In the General Regulation Plan for Brankovina, the built cultural heritage is considered apart from the natural environment, so that methods of systematic revitalization of the space envisage three levels of protection as initial starting point in planning and restoration of the entire area: first level of protection comprises the zone of the historic landmark with its immediate surroundings in which any construction is forbidden; second level of protection comprises a wider area around the historic landmark and represents a zone with the transitional regime of use and with a strict control of construction of educational, cultural, tourist and recreational sports facilities complementary to the function of the historic landmark; third level of protection comprises the other part of the area in which it is possible to develop certain activities within rural households, such as rural tourism, crafts and activities of small economies, with a primary purpose of regulating the unplanned construction. Reconstruction and restoration of existing buildings along with hard landscaping is permitted in each of these zones. Within the mentioned zones of protection, taking into account the problem of insufficient programmatic development of the area, the Plan envisages two sites for further development. The first site is located within the Brankovina cultural and historical complex, while the other one is located in the immediate surrounding area where,

according to the plans of higher level, the Village Community Centre is planned to be a centre of gravity of a wider region.

The first site comprises the area of the Brankovina historical and cultural complex of prime spiritual, historical and cultural importance to the Republic of Serbia. Currently, the complex of the Brankovina immovable historic properties (1) comprises: (a) the old school as one of the oldest schools in Serbia; (b) church with a house and graves of members of a famous Serbian family; (c) vajat as a specific form of vernacular architecture in Serbia – the cabin built of horizontally laid oak planks with a roof covered with wooden shingles; (d) small wooden half-open or open houses for family gatherings (Serbian: sobrašice) with wooden porches and canopies built in churchyards by prominent families in the 19th century (Fig. 2).

The main purpose of its development is to preserve inherited values and safeguard authenticity of urban structure by creating a single cultural landscape [3] as a synthesis of natural and man-made elements. In her exploration of new approaches to the restoration and creation of cultural landscapes, the female author Roter-Blagojević refers to the conclusions of the European Landscape Convention [4] linking the cultural landscape with sustainable development based on a harmonious relationship between architectural heritage and conservation of natural areas which, in addition to ecological, also have cultural and social dimensions [5]. According to the Plan, the proposal of programmatic and urban planning solutions (Fig. 2) includes the following contents: (2) cultural park with a museum of a famous poetess with an open-air stage for different cultural events, and small buildings of a pavilion type for literary workshops and art colonies. The idea of this model of research platform is to promote social sciences and artistic creativity in the form of courses and seminars to be held year round. In such way, the memory becomes an instrument of cultural landscape and valorisation of the protected area [6,7], whereby the landscape is at the same time a spatial setting and a cultural image and represents a strategic medium of cultural change [8]; (3) the following facilities are planned in the zone of extension around the immovable cultural properties: e) tourist information centre with reception and ticket office at the entrance to the cultural and historical complex, with a multifunctional space for a contemporary museological narrative, interactive workshops for children and adults, exhibition space, etc.; f) bookshop café, souvenir gift shop; g) small open-air amphitheatre; h) outdoor display of a small authentic ethno-house typical for this region; (4) tourism and hospitality facilities (ethno-restaurant, small hotel, pastry café and shop) west of the Brankovina memorial complex. In the zone of elementary school located east of memorial complex, the Plan envisages (i) new gymnastics hall and (j) sports grounds with stands (football, basketball, volleyball). In discussing the advantages of conventional approach compared with a modern approach to cultural heritage, Jukilehto indicates that the preservation of authenticity of an entity is an essential quality which implies truthfulness, originality, authenticity [9]. In support of such attitude, we can conclude that further development of methodologies and their better integration into the process of urban planning are a precondition for safeguarding the authenticity of historic sites.

The other site to be developed includes a village community centre (Fig.3), planned as an ethno-park with cultural and educational, tourism and sports recreational contents and hospitality facilities. The complex should become an unavoidable one-stop shop for nearby tourist tours with the aim to present the culture of West Serbia. The programmatic and urban planning solutions contain: (1) visitor centre, (2) hospitality facilities, (3) an artificial lake - the new acquatorium, (4) accommodation capacities of pavilion type (as traditional vajats)

Fig. 2 Programmatic and urban planning solutions for the Brankovina Historic Landmark – the current state (1) and the planned state (2) (3) and (4)

planned for organizing the art colonies, accommodation of tourists, (5) selling/exhibiting showroom for works of art, handicrafts and souvenirs created in art colonies. A special functional entity would include (6) sports recreational contents with grounds for the so-called "small sports". In addition to a system of pedestrian paths and biking trails, (7) covered sitting areas, (8) amphitheatre / moveable market, (9) tennis courts with Tennis Club, the ambience of ethno-park is complemented with the river permeating the entire area.

Fig. 3 Programmatic and urban planning solutions for the Village Community Centre

2.1.2. Flood protection measures

The main hydrographic collectors in the subject area include the Rabas river, left tributary of the Kolubara river, and the Skolski potok creek, its left tributory. From the aspect of planning the Brankovina area, it is essential that both watercourses are ecologically very well-preserved as a hydrographical support for a successful development without significant unfavourable influences of anthropogenic origin. The following facts influence the concept of regulating the Rabasa river and Skolski potok creek: (1) bed morphology of both watercourses and the quality of their immediate surrounding area are quite well-preserved and undisturbed; (2) the quality of their water is still good; (3) both watercourses and their tributaries are characterized by extremely torrential regimes, with very uneven flow rate: flash floods with rapidly growing concentration of flood waves, but of short duration. The flash flood rehabilitation can be carried out without aggressive interventions in the affected area by implementing passive and non-investment measures which would prohibit the construction of structures and prescribe the control of construction of capital facility in zones threatened by flash flooding.

The concept of regulating the watercourses derives from the mentioned hydrogeological characteristics of the Brankovina area and programmatic solutions according to which the area is organized into two sites. The Plan envisages measures of natural flow regulation implying not only ecological preservation of watercourses, but also supplementation of their morphological forms with contents that would also enrich biodiversity and visual experience of their valleys. Such measures are in line with global goals to preserve and enrich not only existing ecological values of watercourses and their riparian areas, but also the overall aesthetic values of an area. A floodplain, as a planning category, is defined in the Spatial Plan of the Republic of Serbia and the Water Law as protected and reserved strip of land along streams and watercourses and other acquatoria. This strip is also defined in relation to the high water level, the so-called 1% probability flood. It comprises a 20-30 m belt on the terrain of the observed highest water line, on both sides of the watercourse, measured from the observed high water level. According to the Water Law, it is forbidden to build any permanent structure on floodplains. However, the floodplains can be used without any restrictions for meadows, plantations (orchards, vineyards, etc.), or for agricultural production. The planning solution provides an undisturbed pedestrian movement and, when necessary, the movement of machinery and equipment in the period of flash flooding and flood defence measures in the 10 m wide strip along the watercourse on both sides of the main bed.

Basic methods of natural river training within the protected Memorial Complex as the first site to be developed are the following: (1) the existing routes of watercourses and their morphological forms have been maintained as a whole in their natural state. They are planned to be stabilized by increasing, if necessary, the flow rate by cleaning bed deposits and by interventions for increasing flow profiles in places clogged with debris carried by flood water. (2) It is not permitted to construct a low river bed with altered trapezoid cross-sections, as is often done, neither is it permitted to line the low river bed with concrete or stone because such lining would completely destroy the ecosystem of watercourses and turn the watercourse into an open collector, practically without any traces of fauna and flora. (3) The stabilization of longitudinal section is achieved by using coarse crushed stone sleepers shaped and fastened so as to mimic natural stone cascades in a mountain stream with rapids and rock waterfalls. (4) The stabilization of bed cross sections is achieved using coarse stone and only where necessary, primarily in concave curves exposed to fluvial erosion. Such are concave curves on the Rabas river in the zone

of the Village Community Centre, for which the stabilization and protection from deformation are planned. (5) The Plan envisages preservation of watercourse beds for high water flow (natural depressions, watercourse bed branching) because they are also very important from the hydraulic and ecological aspect and taking into account that, in this way, a richer biodiversity is achieved. (6) On the considered stretch of the Rabas river and Skolski potok creek, it is sufficient to carry out interventions for stabilizing the concave banks in the zones of the sharpest curves, as well as for stabilizing the longitudinal bed slope with crushed stone barriers in the form of rapids. Only natural materials are envisaged (concrete may be used for fixing the crushed stone in the rapids), while banks are fixed and protected from fluvial erosion by phyto-remediation measures (biological protection) that need to be specially systematized due to their complexity.

New acquatoria as a method of watercourses regulation within the Village Community Centre or within the other site to be developed. The acquatoria of greater area can be formed in suitable parts of watercourses with the aim to enrich visual experience, or for recreational purposes. One of such acquatoria, a small lake of irregular shape, is planned in the Village Community Centre. It will be formed by placing a fixed concrete or stone sleeper in the downstream part of the lake. The elevation of the lake is approximately at the elevation of the river during its mean flow. A moveable barrier approximately up to 1-1.5 m high is planned to be in the form of mounting/demounting beam gates (the impregnated wooden beams being the most suitable ones) which will be placed in leads on both sides of a concrete or stone sleeper. The surrounding terrain would be shaped by an earth filling not higher than approximately 1.5 m to achieve a desired flow slowdown. The gates will be placed in their guides during the hot part of the year, and removed and disposed of at the landfill during periods of flash flooding to avoid unnecessary filling of the lake acquatorium. The lake acquatorium of a desired shape will be formed by an excavation upstream from gates, with the total depth (slowdown from gates including the excavation) of approximately 2.5-3 m. The sleeper in the bed will also fix the stable level of acquatorium in the period when gates are removed. A cobblestone waterfall in the length of approximately 2 m is planned with a downstream cut-off trench that would prevent the bed erosion downstream the barrier. The area around the acquatorium in the belt not narrower than 20 m is considered a floodplain which would be cultivated as a lawn. The self-washing of the lake area will occur in the period of flooding when the beam gates are removed and when water flows freely, but a part of the volume resulting from the excavation will be filled with bed load. For this reason, it will be necessary to intermittently clean the lake from debris by dredging and removing the material. The space for the access of machinery and vehicles, as well as for additional contents necessary for this important operation of intermittent maintenance, is planned in its surrounding area. Special roads for these activities are not needed, but only a space for undisturbed access to the area adjacent to the high water level. Such acquatoria can be also formed in the same way in other parts of the watercourse system, but only under the condition that an access is provided to the machinery (dredges and trucks) for intermittent cleaning of deposited debris.

3. Results and Discussion

The contemporary approach to sustainable development and improvement of historic areas is based on understanding of the place, with the aim to balance all relevant factors in the planning process, which implies a good knowledge of physical, social, cultural and economic

aspects of the area. [10]. The recommendations of the Safeguarding and Contemporary Role of Historic Areas (UNESCO, 1976) suggest that every historic area and its surroundings should be considered in their totality as a coherent whole, defined by balanced relationships between human activities, spatial organization of buildings and the surroundings [11]. In this context, the conservation of cultural and historical values of Brankovina, linking of architectural and cultural structures and natural environment, enhancement of the tourism and economic potentials, as well as implementation of non-invasive flood protection measures, are the key planned results of the development of this area.

A special issue dealt with in the Plan includes a reconstruction of protected cultural heritage based on bioclimatic principles, as well as on principles of energy efficiency and environmental sustainability. The use of methods of environmentally sustainable architecture in protected zones of cultural and historical heritage and ambience entities requires an integrated approach to this extremely important and sensitive problem area in which the cultural context and contexts of ambience (traditions and environment), location, microclimate, existing structures, comfort, used materials and energy use, are of equal importance. [12] According to female author Pucar, the basic principles of traditional architecture contain in themselves a series of elements of environmentally sustainable architecture and sustainable development. Environmentally sustainable architecture denotes an integration of structure and environment and natural energy flows, without disturbing natural ecological balance, whereby climate, location conditions, tradition, materials, contexts, resources, environmental capacity, customs, and conditions of natural and man-made environment of the area, are taken into account. [13,14].

Ensuring the long-term protection and integrated natural and cultural resources management and protection, as well as a gradual implementation of principles of sustainable development of agriculture and environmental conservation along with the use of ecological and energy efficient technologies, leads to the affirmation of cultural tourism in Brankovina, on the one hand, and results in positive socio-economic effects, on the other hand. The introduction of attractive programmes and raising of standard of services of the existing and planned tourist capacities relate to the cultural tourism development, while the initiation and stimulation of the development of complementary activities with respect to the activation of local residents for the production of eco-food and ethnic products and presentation of their customs and way of living offer opportunities for the development of other types of tourism: cultural and event tourism, excursion tourism, sports and recreational tourism, and rural tourism. The development of the local community through the distribution of autochthonous products and increased employment in the existing improved and new tourism and hospitality facilities would directly contribute to the revival of the village.

4. CONCLUSIONS

Starting from the fact that the flood risk is, in a general sense, a combination of occurrence of flood events and possible harmful effects on human health, the environment, cultural heritage and economic activities, the first step in an analysis of flood risk is to determine relevant catchment area and associated hydrographic networks. It is also important to identify possible causes of flooding including: intense rains, snow-melt, coincidence of high water, climate change, as well as various anthropogenic impacts. The flood risk analysis and prohibition of any new construction in zones threatened by flash

flooding are the most important activities within the non-investment flood protection measures. This measure is directed not only towards an efficient and sustainable flood management, but also towards the development of general awareness about the fact that the flood risk is unavoidable and that it is a realistic concept for which specific and appropriate solution must always be found. In already built areas, particularly in the protected cultural and historical entities for which conservation of initial architectural and natural values is of elementary importance, the flood defence mechanisms must be well defined. The presented concept of natural regulation along with environmental conservation of watercourses and enrichment of their morphological forms and biodiversity is fully in accordance with the global goal to safeguard and enrich overall aesthetic and ambience values of overall architectural heritage.

The use of the Plan-based methodology regarding the revitalisation of cultural and historical entities threatened by flooding can be recognized as an efficient procedure for similar examples and problems of endangered architectural heritage in the world.

The principles of bioclimatic architecture on which methods of restoration and reconstruction of protected structures are based on along with taking into account the tradition and conditions of an area, as well as flood defence measures related to watercourse regulation that primarily maintains the existing routes and morphological forms of watercourses, are integral parts of the contemporary concept of planning. A particularly important issue includes the elaboration of the principle of active and passive systems of using solar energy in its original form that is close to users, which is a great advantage from the aspect of the energy and environmental models of protection of natural values of an area.

Furthermore, the solutions offered by this spatial plan in methodological sense and which are directed towards achieving the sustainable development and higher level of economic self-sustainability along with safeguarding the important resources of Brankovina, relate to enabling the development and popularisation of contents of the cultural and historical complex, enhancement of infrastructure and improvement of internal communications along with initiating the socio-economic progress of local community.

Acknowledgement: *This paper is a part of research conducted through the Scientific Project 'Spatial, environmental, energy and social aspects of developing settlements and climate change – mutual impacts' (TR 36035), financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.*

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ISTORIJSKI PEJZAŽ NEPOKRETNIH KULTURNIH DOBARA U BRANKOVINI I MERE ZAŠTITE OD POPLAVA

Odnos prema vrednostima kulturnog nasleđa je jedan od važnih faktora u oblikovanju karaktera mesta i karaktera kulturno-istorijskog ambijenta. Kulturno nasleđe igra važnu ulogu u jačanju regionalne i lokalne kulture i tradicije u odnosu na ekonomska i socijalna pitanja, kao i u pogledu regulisanja zaštite životne sredine. Kulturno-istorijski kompleks Brankovina - nepokretna imovina od izuzetnog značaja, je važan kulturni centar Srbije, koji podrazumeva integrisanu zaštitu svih struktura zajedno sa okolnim područjem. Bespravne gradnje, neodgovarajuće rekonstrukcije i intervencije u ovoj oblasti rezultat su nedostatka propisa urbanističkog planiranja tokom dugog vremenskog perioda. Nedovoljno razvijena svest o značaju kulturnog nasleđa za razvoj ove oblasti, kao i nedostatak jasno definisanih programa i mera koje bi obezbedile kontinuirani proces zaštite, predstavlja stalnu pretnja opstanku ovog važnog nasleđa. Problem rizika od poplava je mnogo izraženiji u ovoj oblasti nego u drugim delovima Srbije zbog složenosti zaštite istorijskog nasleđa i posebnih ambijentalnih kvaliteta. Rad na programu razvoja u oblasti koja bi omogućila prostorne, ekološke, ekonomske i funkcionalne uslove za dalji razvoj i zaštitu ovog područja je počela nakon usvajanja odluke o planu generalne regulacije. Ostvarivanjem ciljeva kreće se ka afirmaciji, zaštiti i unapređenju kulturnog i istorijskog kompleksa Brankovina, kao tradicionalne kulturne baštine, uz planiranje novih objekata koji će biti prikladni za značaj područja, a bez posledica po životnu sredinu.

Ključne reči: *nepokretna kulturna dobra, restauracija, prostorno i urbanističko planiranje, zaštita od poplava*