

CONFERENCE
PROCEEDINGS

**5th INTERNATIONAL
ACADEMIC CONFERENCE ON
PLACES AND TECHNOLOGIES**

EDITORS

**ALEKSANDRA KRSTIĆ-FURUNDŽIĆ
MILENA VUKMIROVIĆ
EVA VANIŠTA LAZAREVIĆ
AND ALEKSANDRA ĐUKIĆ**

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CULTURAL LANDSCAPE OF ANCIENT VIMINACIUM AND MODERN KOSTOLAC – CREATION OF A NEW APPROACH TO THE PRESERVATION AND PRESENTATION OF ITS ARCHAEOLOGICAL AND INDUSTRIAL HERITAGE¹

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ABSTRACT

Viminacium, once an important Roman city and a legionary fortress near the Danube, situated in the villages of Stari Kostolac and Drmno, in Serbia, near a strip coal mine and a power plant, today is the most developed archaeological park in Serbia and is visited by many tourists. However, the future sustainable development of the wider area requires the creation of a more comprehensive approach to the presentation of its archaeological and industrial heritage, connecting *Viminacium* and other historical traces into a cultural landscape where industrial progress, heritage preservation and modern tourism are linked.

Keywords: Viminacium, Kostolac, cultural landscape, archaeological heritage, industrial heritage.

Introduction

Viminacium, an archaeological site and a cultural property of exceptional importance for the Republic of Serbia, is located on the right bank of the Mlava river, near the Danube, in the fields of the Stari Kostolac and Drmno villages, by the thermal power plant “Kostolac B” and the strip coal mine “Drmno”, in the vicinity of Požarevac. In 2006, The Viminacium Archaeological Park (Golubović, Korać 2013; Anđelković et al. 2013) was established here, and in 2009, the entire area of the fortified ancient city and legionary fortress, along with its close surroundings, was defined as a site with borders and protection regimes (Decision 2009). From 2015, *Viminacium* has been a part of the UNESCO Tentative List with other Roman sites along the Danube limes from Germany to Romania (UNESCO 2015). Located on cultural routes and the most important European corridors, The Viminacium Archaeological Park is the main promoter of tourism development in the Požarevac area today, with national, regional and local policies recognising its importance³

1 The article results from the projects: IRS - Viminacium, Roman city and military legion camp – research of material and non-material culture of inhabitants by using the modern technologies of remote detection, geophysics, GIS, digitalization and 3D visualization (No. 47018) and Modernisation of Western Balkans (No. 177009), funded by The Ministry of Education, Science and Technological Development of the Republic of Serbia.

2 Corresponding author

3 The Viminacium archaeological site is included in the Spatial Plan of the Republic of Serbia from 2010 to 2020 as a priority cultural area and strategic priority in the field of tourism, protection and sustainable development of the environment, natural and cultural heritage. The Spatial Plan of the City of Požarevac (Spatial Plan 2012) and the Spatial Plan for the Special Purpose Area of Kostolac Coal Basin

However, in accordance with the exceptional historical, cultural and architectural values of ancient *Viminacium*, specific natural qualities of the Danube, as well as the great contemporary significance of the power plant and mine in Kostolac, the main aim of this paper is to point out the need to consider the wider spatial and social context of the area's development, from ancient to modern times, in order to establish a sustainable concept of its preservation, presentation and management, which, in accordance with contemporary UNESCO and ICOMOS doctrines, imply its protection as a specific cultural landscape (Nikolić et al. 2013). The focus will be on the interactions between its natural and cultural elements throughout history, especially between its archaeological and industrial heritage.

Archaeological heritage and contemporary industry in the area of Viminacium

The Kostolac region has been densely populated since the 4th millennium BC. A culture from the Copper Age received its name "Baden - Kostolac" from the first sites in which it was recorded. The oldest Celtic necropolis in the northern Balkans, dated to the 4th and 3rd century BC, was found in this area. *Viminacium* was founded here in the 1st century AD as one of the most important Roman legionary fortresses on the middle Danube. Soon after, a large urban settlement was developed, becoming the capital of the province of *Moesia Superior* (Spasić-Đurić 2015). On the plateau of the Sopotska Greda hill, above the village of Stari Kostolac, there are remains of the medieval town of Braničevo, while at the foot of the plateau there are the mining colony and industrial settlement built by Đorđe Vajfert in the 19th century, with an entrance to the old underground coal mine. Natural beauty is presented here with the Danube, which formed the natural border of many historical empires. On its bank the nearby village of Ram is situated, with the remains of the ancient *Lederata* fort and Turkish fortress from the 15th century (Roter-Blagojević et al. 2013).

Especially important for life in this area are the surface coal exploitation and electricity production in Kostolac, which have been developing here for more than seven decades, that is to say, since The Second World War, when the Germans opened the first surface coal mine in the area of the present town of Kostolac (Marković 1971). Until the opening of the "Drmno" mine and the thermal power plant "Kostolac B" in 1987-1988 (Anđelković 2010), agriculture was very developed in the Stig plain, even in ancient times, when it was the most fertile land in *Moesia Superior* (Medović 2014). However, due to the coal exploitation, a sixth of the total number of households in Drmno village remain completely without land, while 70% of them have less than 2 ha of arable land, almost half of which is planned to be expropriated (Miljković et al. 2009). According to the estimation of deposits, the exploitation will last until 2059. The plan is to reclaim degraded areas as lakes, forests and meadows (Spatial Plan 2013) and to construct wind turbines and solar power plants (Decision 2016).

(Spatial Plan 2013) emphasize the connection between the Danube, Požarevac and Viminacium through tourism. With the support of the Ministry of Trade, Tourism and Telecommunications of RS, the creation of the touristic port in Kostolac was begun in 2015 (MTT 2016). Viminacium is included in the Spatial Plan for the Special Purpose Area of International Waterway E80 – Danube – Pan-European Corridor VII (Spatial Plan 2015a), while the planning and regulation solution for it is determined by the Spatial Plan for the Special Purpose Area of Archaeological Site Viminacium (Spatial Plan 2015b). According to the Master Plan for Sustainable Development of Rural Tourism of Serbia (UNWTO 2011) it is the greatest cultural attractor after the Guča Festival, while in the Master Plan Stig-Kučajske Planine-Beljanica, it is the most prominent tourist potential (INC Ekonomski fakultet Beograd 2012). In the Strategy of Sustainable Development of the City of Pozarevac from 2017 to 2022, Viminacium is the most important tourist attraction with Ljubičevo (Strategy 2017). It is a part of the European cultural route "The Roman Emperors and Danube Wine Route" (European Institute for Cultural Routes 2015) modelled on the route "Itinerarium Romanum Serbiae (IRS)" established by Dr Miomir Korać and The Archaeological Institute, but also one of the points on the bicycle Euro Velo route no.6 and E4 European long distance path (Nikolić, Emilija, Roter-Blagojević, Mirjana. 2017)



Figure 1: Mining colony in Stari Kostolac, a view to Viminacium from the power plant “Kostolac B” (photos: E. Nikolić); Kostolac town (SkyscraperCity.2007); coal mine “Drmno” (archive of the Institute of Archaeology).

Modernisation and industrial development in the 19th and 20th centuries have negatively affected nature throughout the world with environmental pollution reaching a level which potentially threatens life on Earth. Along with this, cultural heritage has also been influenced. The opening of the underground mines in Stari Kostolac, in (1873), and in the village of Klenovnik (1885), industrial works during the German occupation in the Second World War, as well as the opening of the mine in the village of Ćirikovac in 1956, have led to the destruction of numerous archaeological sites (Spasić-Đurić 2012). At a location where more than ten thousand graves were discovered, dated to the period from the 4th century BC to the 16th century (Zotović 1986), the “Kostolac B” thermal power plant was built, while exploitation in the “Drmno” mine has destroyed sites related to many historic periods. The *decision on determining the Viminacium site in the village of Stari Kostolac for the archaeological site* (Decision 2009) is one of the bases for resolving the conflicting interests that exist between the protection of cultural heritage and industrial development in this area (Maksin et al. 2011). However, it only prohibits the exploitation of coal in the area of the fortified city and the legionary fortress of *Viminacium*, while the remainder of its wider urban territory and other cultural properties from the area have remained unprotected. The only solution for their preservation is relocation, which several buildings of *Viminacium* have undergone to this day, with the support of Electric Power Industry of Serbia (EPS).

Preservation of historical places of exploitation and technology

The archaeological and industrial heritage of the area of ancient *Viminacium* and modern Kostolac can be presented as the result of a continuous process of the exploitation of natural resources and their further technological processing.

The fact that loess with a high content of clay covers most of the territory has helped the development of brick production in the area throughout history. Production in ancient *Viminacium* was done for the purpose of its building industry, but also for the building of other settlements on the limes (Nikolić 2013). In the area of Požarevac, the brick industry was highly developed in the 19th and 20th centuries (Milenković, Protić 1936). In 1885, a brick factory was built in the

area of the Vajfert mine. Soon after, it was closed because it could not compete with small rural manufacturers (Marković 1971). Today, brick factories in the Požarevac area are abandoned and only one rural workshop makes products for further distribution, exporting products to many European countries (Cotto Rustico 2015). This traditional skill is an important immaterial heritage of the area and every attempt should be made to try and preserve it. Recording the old closed workshops in the area and buildings that were built with this product, along with education of young people in villages by old masters and their encouragement in business development, can be part of this process.



Figure 2: Ram stone quarry, *crvenka* quarry, brick kilns from *Viminacium*, brick kiln in a present day village near Viminacium, *Viminacium* wall made of *crvenka*, modern blocks made with *crvenka* (photos: E. Nikolić)

Quarries in the area of the present day village of Ram were exploited for centuries as a source of building stone for *Viminacium*, the Ram fortress, monasteries and rural houses. The quarry near the Danube endangered the remains of the ancient *Lederata*, and exploitation is forbidden today. However, along the river a plateau remained, giving a possibility of presenting the quarry as a piece of archaeological, as well as industrial heritage. Such projects are common in Europe, including ecological interventions (soil and ecosystem recovery) aesthetic interventions (improvement of visual features), as well as functional interventions (creation of sculpture parks and open-air theatres) (Gašparović et al. 2009). In the area of the Ram quarry, nature is slowly recovering, the area's visual features are exceptional, so functional interventions can be considered even today.

Đorđe Vajfert received the concession for the opening of the Kostolac mine in 1873 (Anđelković 2010) and in 1881 became its owner. By 1889 it was the main Serbian coal producer and the only coal exporter (Marković 1971). Coal exploitation in this territory prior to the 19th century is not mentioned in any historical sources. However, coal can be linked to ancient history because of *crvenka* – a natural material whose deposit is located in Stari Kostolac around the mine. It represents a layer of sedimentary rock that passed through a metamorphism due to lower coal layers burning after contact with oxygen and sunlight. As a *natural brick* it was used in Roman *Viminacium* in the early period of the still undeveloped brick industry, but also in the later crisis periods as a cheap and easily accessible material (Nikolić 2013). It was also used by the Romans for the construction of roads, while in modern times, industrial roads and building blocks were made of this material. Its exploitation is prohibited today due to soil

instability, but it left a plateau at the foot of Sopotska greda, which could be presented as an example of archaeological and industrial heritage. Since it is related to a particular soil type in combination with the existence of coal and, thus, is not often encountered, it is also a valuable piece of geo-heritage.

Preservation of industrial heritage and development of contemporary culture

The Vajfert colony was founded as a workers' settlement near Kostolac village. However, the colony and the village soon became one unity (Marković 1971), the present-day Stari Kostolac. Buildings of the colony are listed as cultural properties under prior protection, but today they are in a poor condition and illegally occupied by members of the Roma community. They are owned by EPS, which has no economic interest in their renewal. However, the integration of the story into its corporate social responsibility policy, as well as the application of sustainability principles that promote the preservation of the embodied energy of buildings through adaptive reuse (Roter-Blagojević, Tufegdžić 2016), could lead to their rehabilitation. As a part of the project for the permanent closure of the "Klenovnik" mine, EPS and the Belgrade Mining Institute initiated plans for the reclamation of the area near the old mining colony in 2011. The plans also included the creation of an art colony and sports complex, as well as the Mining Museum in the existing administrative mine building, with the presentation of equipment and underground mining in the open space, along with the construction of a tourist railway, connecting the Danube, Kostolac, the Museum and Viminacium (Radosavljević et al. 2014). All these plans have, to date, remained unrealised.



Figure 3: IBA project - Landmark Lusatian lake land (IBA-SEE 2010); Latz + Partner- Duisburg Nord Landscape Park (Latz+Partner 2016); Latz + Partner - Duisburg Nord Landscape Park (Latz+Partner 2016)

Considering the planned reclamation of the destroyed fields, which is important for the reconstruction of the natural landscape, we should mention that these areas could reach an even higher aesthetic value compared to their state before degradation (Spasić et al. 2009). During the revitalisation of coal mines in Germany, artificial lakes and recreation areas were created, hotels and theatres were built, while the former thermal power plant was converted into a cultural space (IBA-SEE 2010). "Emscher Park" in the Ruhr region has been a model for restoration of devastated exploitation fields in Europe since 1988 (Gašparović et al. 2009). Its designers used elements that we accept, but also those that disturb us, both harmonic and interrupting ones (Latz+Partner 2016), embedding green, water and walking surfaces into abandoned concrete structures, which then act as sculptures in space.

In the world, monuments of industrial heritage have been recognised as ambiances for cultural activities and creative economies for many decades. Moreover, the main contribution to the preservation of this heritage does not come from state actions, but from the initiatives of volunteers and representatives of the creative sector. The activation of abandoned buildings

brings economic income from tourism, but also helps non-affirmed professionals, contributing to employment (Čizler 2014). The aforementioned failed realisation of plans for the revival of the area of the “Klenovnik” mine shows that maybe some successful examples of building reuse from Europe and the role of the creative sector should be followed from the start. Even a partially renewed Vajfert colony would be able to accommodate some creative activities which could bring social development. These would be precious experiences which could help in the future reuse of the industrial complexes.

An important fact that gives character to the Viminacium landscape is that the local communities were closely related to mining for 150 years. Many miners from the former SFR Yugoslavia and Europe settled here in the 19th and 20th centuries (Anđelković 2010) and with the local population that changed its agricultural occupation during industrialisation, saw the disappearance of an “ethnically and culturally homogeneous environment” (Romelić 2000). Thus, the Kostolac mines are the witnesses of the beginning of modern industry in Serbia, but also of the social development of SFR Yugoslavia in the post-war period. The establishment of a small museum by a former miner in Kostolac confirms this,⁴ following the world trend of nostalgia for reminders of the past embodied in small niche museums, where visitors can find a more personal connection with the heritage (Robinson 2008).

Conclusions

The synergy of nature with tangible and intangible cultural heritage is the basic feature of a cultural landscape. The Danube, agricultural fields, the *Viminacium* archaeological site and the mining industry equally participate in the creation of this landscape. A pastoral historical landscape with ancient remains in an interaction with industry has become a modern technological landscape which will disappear once the natural resources have been exhausted. A new landscape will then emerge and it should be preserved as a unique testimony to the interactions between man and nature.

The value of cultural landscapes is not only in their physical elements, they are places where the process of building the identity of a region is initiated (Röhring 2011). This is particularly important in the case of local communities that are endangered by industrial development, such as those around the “Drmno” mine, which lost a huge percentage of land. Within a few decades the exploitation of coal will stop here and new opportunities for development of the area will be needed. The cultural tourism industry is one of the most promising potential opportunities. However, it should not be based only on the Viminacium Archaeological Park, as is the case today. Remains of other historic sites, traditional and modern industry and technologies based on the exploitation of natural resources, as well as the rural heritage and nature, should also be included. Only a balanced relationship between these elements can offer a satisfying result in the preservation of the landscape, giving sustainable economic development and prosperity to society.

References

Anđelković, Vladimir, ed. 2010. 140 godina rudnika Kostolac 1870-2010. Kostolac: PD TE-KO Kostolac.

4 Petko Popović, born in 1933, established two museums in his home town of Kostolac. The Mining and Folk Museum “Đorđe Vajfert” has over 3,000 artefacts that he has collected over the past fifty years across SFR Yugoslavia (mining tools, equipment, uniforms, photographs and a 19th century cart from the Vajfert mine), while in the Private Folk Museum “Tito”, over 3,500 items are exhibited (Novosti 2015).

- Anđelković Grašar, Jelena et al. 2013. "Viminacium, Archaeological Park – Modern Code for Re-Reading the Past of the Roman City and Legionary Camp". In *Studies on Disasters, Catastrophes and the Ends of the World in Sources*, edited by J. Popielska-Grzybowska, J. Iwaszczuk, 267-272. Pułtusk: The Pułtusk Academy of Humanities.
- Cotto Rustico 2015. "O nama". Accessed March 30, 2018. <http://www.cottorustico.com>
- Čizler, Jasna. 2014. "Industrijsko nasleđe kao potencijal za razvoj kreativne ekonomije". In *Kreativna & Kolaborativna ekonomija i lokalni razvoj*, edited by A. Đerić, 21-31. Beograd: Academica.
- Decision on Determining the Viminacium Site in the Village of Stari Kostolac for the Archaeological Site". 2009. Official Gazette RS 102/2009.
- Decision on Development of the Amendments to the Spatial Plan for the Special Purpose Area of Kostolac Coal Basin. 2016. Official Gazette RS 7/2016.
- European Institute for Cultural Routes. 2015. "The Roman Emperors and Danube Wine Routes". Accessed March 30, 2018. <http://www.culture-routes.net/routes/the-roman-emperors-and-danube-wine-route>
- Gašparović, Sanja et al. 2009. "Modeli pejzažne sanacije i prenamjene kamenoloma: Oporavak pejzaža", *Prostor* 17: 372-385.
- Golubović Snežana, Korać Miomir. 2013. "Bringing to Life the Ancient City of Viminacium on the Danube". In *Presenting the Romans: Interpreting the Frontiers of the Roman Empire World Heritage Site*, edited by Nigel Mills, 65-73. Woodbridge: Boydell Press.
- IBA-SEE 2010. "IBA Projects in Europe's Biggest Building Site. Between Landscape Islands and Main Categories". Accessed February 24, 2018. www.iba-see2010.de
- INC Ekonomski fakultet Beograd. 2012. "Master Plan Stig - Kučajske Planine-Beljanica".
- Latz+Partner. 2016. "NODU. Duisburg Nord Landscape Park, DE". Accessed February 27, 2018. <https://www.latzundpartner.de/en/projekte/postindustrielle-landschaften/>
- Maksin, Marija et al. 2011. *Održivi razvoj turizma u Evropskoj uniji i Srbiji*. Beograd: IAUS.
- Marković, Saša, ed. 1971. *Združeno elektroprivredno preduzeće Srbije – IEK Kostolac 1870-1970*. Kostolac: Odbor za proslavu sto godina rudnika i 25 godina termoelektrane IEK-Kostolac.
- Medović, Aleksandar. 2014. "Viminacium: Roman agriculture on Serbian soil?", *Archaeology and Science* 9/2013: 95-99.
- Milenković, Milutin, Protić, Živojin. 1936. *Prirodne lepote i bogatstvo Pomoravlja, Stiga, Braničeva, Zvižda i Homolja*. Beograd: Udruženje Požarevljana.
- Miljković, Ljupče et al. 2009. "Fizičko-geografske promene nastale kao posledica eksploatacije lignita na površinskom kopu Drmno", *Зборник радова Департамана за географију, туризам и хотелијерство* 38/2009: 20-34.
- MTT. 2016. "Mr. Ljajić: The Danube is a Large Potential, Releases". Accessed Mar 30, 2018. <http://mtt.gov.rs/en/releases-and-announcements/mr-ljajic-the-danube-is-a-large-potential/?lang=lat>
- Nikolić, Emilija. 2013. "Contribution to the Study of Roman Architecture in Viminacium: Construction Materials and Building Techniques", *Archaeology and Science* 8: 21-48
- Nikolić, Emilija et al. 2013. "Possibilities of Defining the Archaeological Site of Viminacium as a Unique Cultural Landscape". In *Strategie e programmazione della conservazione e trasmissibilità del patrimonio culturale*, edited by A. Filipovic, W. Troiano, 260-271. Rome: F.S.S. Editions.
- Nikolić, Emilija, Roter-Blagojević, Mirjana. 2017. "A New Dialogue between Past and Future – the Archaeological Site Viminacium within the New National and International Frameworks". In *19th International Conference and General Assembly of the Experts Fondazione Romualdo Del Bianco — Proceedings*, edited by C. Del Bianco, 198-204. Florence: Masso delle Fate Edizioni.
- Novosti. 2015. "Divi se liku i delu druga Tita". Accessed February 23, 2018. www.novosti.rs/вести/србија.489.html:572388-Диви-се-лику-и-делу-друга-Тита
- Radosavljević, Milinko et al. 2014. "Kostolački basen – primer mogućeg pristupa održive površinske eksplo-

latacije uglja”, Rudarski glasnik CXI, 1-2: 55-60.

Robinson, Mike 2008. “The Experiences of Cultural Tourism”. In *Cultural Heritage and Tourism: Potential, Impact, Partnership and Governance*, edited by M. Lehtimäki, 18-25. Vilnius: Department of Cultural Heritage.

Romelić, Živka. 2000. Rudarski stanovi u severoistočnoj Srbiji, *Glasnik Etnografskog instituta* 49: 225-230.

Roter-Blagojević, Mirjana et al. 2013 “A new Life of the Ottoman Fortress Ram”, *Journal of Cultural Heritage* 14/3: S20–S24.

Roter-Blagojević, Mirjana, Tufegdžić, Anica. 2016. The New Technology Requirements and Sustainable Approach to Industrial Heritage Renewal, *Energy and Buildings* 115: 148-153.

Röhring, Andreas. 2011. “Cultural landscape as Action Arena - an Identity-Based Concept of Region-Building”, *Regional Studies Association, Annual Int. Conf. 2011*. Accessed Feb 25, 2018. <http://www.regionals-tudies.org/uploads/funding/conferences/presentations/international-conference-2011/rohring.pdf>

SkyscraperCity. 2007. “Danube”. Accessed February 25, 2018. www.skyscrapercity.com/showthread.php?t=1430814

Spasić, Nenad et al. 2009. “Uticaj proizvodnih sistema u velikim rudarskim baenima na planiranje razvoja, obnavljanje i uređenje prostora”, *Arhitektura i urbanizam* 26/09: 67-76.

Spasić-Đurić, Dragana. 2012. “Uticaj rudarstva i energetike na arheološke lokalitete u regiji Kostolca”, *Zbornik radova Visoke tehničke škole Požarevac* 1-2: 1-17.

Spasić-Đurić, Dragana. 2015. *Grad Viminacijum*. Požarevac: Narodni muzej.

Spatial Plan of the City of Požarevac. 2012. *Official Gazette of the City of Požarevac* 10/2012

Spatial Plan for the Special Purpose Area of Kostolac Coal Basin. 2013. *Official Gazette RS* 1/2013.

Spatial Plan for the Special Purpose Area of International Waterway E80 – Danube – Pan-European Corridor VII. 2015a. *Official Gazette RS* 14/2015.

Spatial Plan for the Special Purpose Area of Archaeological Site Viminacium. 2015b. *Official Gazette RS* 14/2015.

Strategy of Sustainable Development of the City of Pozarevac from 2017 to 2022. 2017. *Official Gazette of the City of Požarevac* 3/2017

UNESCO. 2015. “Frontiers of the Roman Empire (WHS FRE)”. Accessed February 25, 2018. <http://whc.unesco.org/en/tentativelists/6060/>.

UNWTO. 2011. “Master Plan for Sustainable Development of Rural Tourism of Serbia”.

Zotović, Ljubica. 1986. “Južne nekropole Viminacija i pogrebni obredi”, *Viminacium* 1: 41-60.

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