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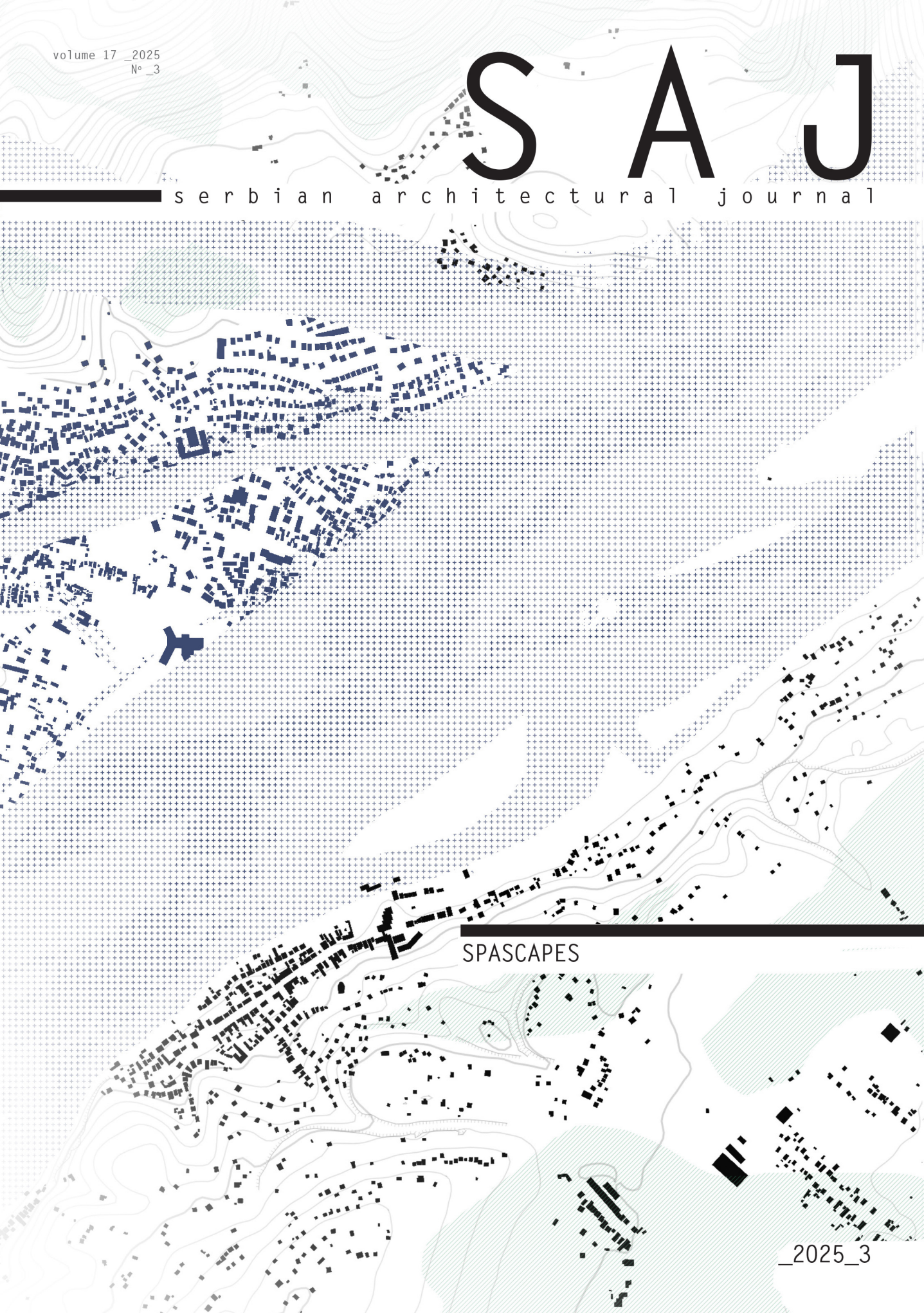

SPASCAPES

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CONTENTS

Guest Editors: **Aleksandra Milovanović, Mladen Pešič and Stefan Janković**

SPASCAPES

Spa settlements represent one of the most distinctive spatial-cultural formations in European and global urban history. Emerging at the intersection of natural therapeutic resources, architectural heritage, and evolving urban morphologies, these environments have continuously mediated between nature, medicine, leisure, and collective imaginaries of well-being. Their development over centuries demonstrates how specific ecological conditions, healing water systems, and landscape structures have shaped architectural typologies, public spaces, and spatial narratives. In the contemporary moment marked by environmental uncertainty, growing health-oriented lifestyles, and renewed interest in heritage-sensitive development – spascapes re-emerge as key sites for rethinking sustainable territorial futures.

This Special Issue of the *Serbian Architectural Journal*, developed within the framework of the SPATTERN initiative (Science Fund of the Republic of Serbia), brings together a curated collection of research contributions that critically examine spa settlements through architectural, urban, landscape, and heritage-focused lenses. Although diverse in scope, methodology, and disciplinary position, all papers share the ambition to reconceptualize spa territories not merely as destinations of medical treatment or tourism, but as complex therapeutic ecologies, where spatial form, cultural memory, environmental processes, and experiential qualities co-produce conditions of well-being.

Methodological Repositioning of Spascapes: Mapping, Morphology, Phenomenology, and Design

The contributions assembled in this Special Issue reposition the study of spascapes by demonstrating how mapping, morphological inquiry, phenomenological interpretation, and design-based research collectively expand the methodological horizon of spa-related studies. Across the papers, spascapes emerge as multidimensional environments whose restorative potential is inseparable from their spatial structure, cultural layering, ecological dynamics, and experiential affordances.

The issue begins with a methodological shift toward inclusive spatial ecologies, introduced through Ristić's mapping-based analysis of accessibility in Sokobanja. By examining the interaction between wheelchair users, assistive technology, and the terrain of the spa settlement, the study establishes accessibility not merely as a technical parameter but as an essential criterion of restorative spatial quality. Mapping thus becomes a diagnostic tool, revealing how spatial morphology either enables or limits health-supportive environments.

This concern with spatial structure continues in Jovanović's exploration of Mihajlo Mitrović's spring pavilions in Vrnjačka Banja, which situates architectural form within a broader landscape narrative. Through morpho-typological and phenomenological readings, the research positions the pavilions as mediators between water, terrain, and cultural memory. Architecture appears as a narrative medium that anchors identity, translating landscape conditions into symbolic and spatial expression. Such a perspective enriches the conceptual understanding of spascapes by articulating their architectural components as carriers of meaning, continuity, and ritualized experience.

The thematic range expands further through Bradić and Kordić research lens, who use theories of leisure to interrogate how spa environments participate in broader cultural imaginaries of free time. Their work operates at a speculative and conceptual level, situating spascapes within emergent social temporalities and future-oriented leisure practices, thereby extending the interpretive field beyond traditional spa analysis.

A strong phenomenological and environmental orientation appears in Petrović's reading of Stari Slankamen, where the spa is redefined through its surrounding protected landscape. By tracing how cultural heritage, natural features, and microclimatic qualities shape multisensory well-being, the study reframes the spa as an open therapeutic system rather than an isolated medical facility. This integrative approach positions landscape, memory, and environmental attachment as vital components of spatial health.

The landscape continues to appear as a generative morphological agent in Ljujić's comparative study of spa settlements in the Pannonian Basin. By revealing subtle but consequential variations in landform, vegetation, and microclimate, the research demonstrates how seemingly uniform lowland environments produce distinct spatial models. In this way, landscape morphology is not treated as a backdrop but as an active structuring force that shapes spa identity, spatial logic, and long-term ecological resilience.

Design-research enters the methodological landscape through the contribution of Mihailović, Mitrović, and Milovanović, who synthesize insights from six studio-based projects to outline a restorative design framework. Their analytical matrix, grounded in spatial–morphological, programmatic–functional, and environmental–restorative dimensions, reveals recurring restorative mechanisms and generates three overarching scenarios: sensory–atmospheric restoration, heritage continuity, and eco-cultural regeneration. The paper positions design not only as a speculative tool but as an evaluative and operational methodology for guiding future interventions in spa territories.

Finally, Maksimović extends the notion of spascapes into aquatic contexts by examining floating therapeutic facilities across Europe. Her comparative analysis highlights the adaptability, ecological responsiveness, and social accessibility of floating wellness typologies, proposing their relevance for Serbian riverine and lacustrine environments. By shifting the spatial domain from land to water, this research expands the typological and geographical boundaries of the field, pointing to new forms of climate-adaptive and publicly engaging spascapes.

Taken together, these contributions form a coherent methodological constellation: (1) mapping reveals barriers and potentials, (2) morphology uncovers structural and landscape-driven logics, (3) phenomenology interprets sensory and symbolic dimensions, and (4) design articulates restorative futures. In their convergence, these approaches reposition spascapes as rich analytical and operative terrains: sites where interdisciplinary methods collectively illuminate the spatial, cultural, and ecological complexity of therapeutic landscapes.

Collective Insights and Contribution of the Special Issue

Taken together, the seven contributions in this Special Issue demonstrate that spascapes transcend disciplinary boundaries. They emerge as multilayered territorial systems shaped by:

- spatial and landscape morphology,
- cultural and architectural heritage,
- environmental processes and ecological dynamics,
- sensory experience and therapeutic atmospheres,
- socio-cultural practices of leisure and well-being,
- inclusive planning and accessibility frameworks,
- speculative and emerging typologies of wellness infrastructures.

The papers spotlight spascapes not merely as historical or touristic artifacts, but as operational frameworks for contemporary planning, design, and heritage stewardship. Through cartographic mapping, phenomenological interpretation, design-research methodologies, landscape analytics, and comparative case studies, the issue articulates a comprehensive spatial and conceptual foundation for future research. We hope that this curated collection inspires further scholarship, supports innovative planning and design practices, and contributes to the recognition of spa settlements as vital therapeutic and cultural landscapes within contemporary architectural and urban research.

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The Science Fund of the Republic of Serbia had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, as well as in the decision to publish the results.

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ALIGNMENT OF INFRASTRUCTURE AND ASSISTIVE TECHNOLOGY: MAPPING THE ACCESSIBILITY OF SOKOBANJA TOURIST ATTRACTORS FOR WHEELCHAIR USERS

ABSTRACT

This research examines the accessibility of Sokobanja Spa for people with physical disabilities who use wheelchairs as assistive technology. The study analyses the relationship between the spatial morphology of the spa settlement, its tourist attractors, and the accessibility of urban and natural environments. The research applies a mapping method to identify barriers and assess the degree of spatial accessibility for wheelchair users. Attractors, such as cultural heritage sites, public spaces, natural areas, and wellness facilities, are categorised as point, linear, or surface elements and evaluated according to their accessibility. The study identifies alignment between the spatial organisation of spa facilities and the accessibility of their activities. The results reveal that although the central promenade and main public areas are relatively accessible, significant barriers remain in areas with steep terrain and heritage buildings. The research contributes to the understanding of how assistive technologies interact with the built environment and proposes that mapping can serve as a methodological tool for improving accessibility and guiding inclusive spatial planning in spa settlements.

Milan Ristić

University of Belgrade – Faculty of Architecture

KEY WORDS
SPA INFRASTRUCTURE
ACCESSIBILITY
WHEELCHAIR USERS
MAPPING
INCLUSIVE DESIGN
SOKOBANJA

1. INTRODUCTION

The therapeutic properties of thermal springs were recognised as early as the Roman period, when such places served not only for healing but also for leisure, cultural activities, and social interaction. Medical tourism involves users travelling for treatment and medical intervention. In contrast, wellness tourism focuses on pleasant and satisfying experiences that enhance personal well-being, aiming to reduce stress and establish the balance of body, mind, and spirit (Dimitrovski, Marinković, Đorđević, & Sthapit, 2024). Research in the area of tourism highlights Serbia's potential to develop a wellness tourism model through the management and privatisation of spas, following examples from other parts of Europe (Arsić, Vujko, & Knežević, 2024). The significance of spas for people with disabilities is evident in all of these aspects, particularly regarding medical services that support rehabilitation and alleviate symptoms associated with disability. At the same time, wellness tourism provides psychological and emotional benefits by reducing stress.

This paper explores the accessibility of the infrastructure and activities of Sokobanja Spa settlement for people using wheelchairs, focusing on the spatial compatibility with assistive technologies. Persons with limited mobility were selected as the target group due to the relevance of medical tourism in easing their physical difficulties. Currently, there is minimal knowledge about the barriers that affect the participation of wheelchair users in spa-related activities. When visiting a spa, a person using a wheelchair is rarely informed about the obstacles they might encounter or how they shape their overall experience (Michopoulou & Hilton, 2021). The main aim of the research is to identify spatial barriers and to create a database and map that can both inform wheelchair users about accessible spa infrastructure and assist local authorities in understanding which barriers must be removed to achieve systematic functionality of the settlement. The research, therefore, examines the current state of accessibility in Sokobanja and identifies which attractions are available to people with disabilities. Based on this aim, the hypothesis is that the morphology and functioning of the spa settlement reveal discontinuities between the provided spa activities and their accessibility for people with disabilities. Following the introduction—which outlines the subject, research question, objectives, hypothesis, and structure of

the paper—the study presents a contextual framework that describes the social and medical models of disability, the importance of accessibility, and the role of assistive technologies. This section also explains the criteria for selecting Sokobanja as a case study and provides a brief overview of its historical development. The methodology describes the models used for identifying and mapping barriers, followed by the presentation and discussion of results, and finally the conclusion summarising the key findings of the research.

2. CONTEXTUAL FRAMEWORK OF THE RESEARCH

2.1. Disability, Accessibility and Assistive Technologies

According to the 2011 census, 571,780 residents of the Republic of Serbia were identified as persons with disabilities, representing approximately 8% of the total population (Lazarević, et al., 2022). These figures should be interpreted with caution, given the complexity of the topic and the changing definitions of impairment and disability. According to the World Health Organisation, more than one billion people worldwide currently live with some form of disability, which accounts for around 15% of the global population. In contemporary terms, impairment refers to a physical characteristic of an individual that, within a social context, marks them as a person with a disability (Gissen, 2023). This distinction is crucial because it emphasises that impairment is not the defining characteristic of a person, but instead that disability is socially constructed.

Until the mid-twentieth century, disability was perceived as an individual's medical problem that needed to be corrected. Within this model, the focus was placed on the individual and their ability to adapt through treatment, medication, and the use of aids, supported by the state. Disability was regarded as an individual problem, and the task of professionals was to "bring" a person closer to socially accepted norms of life. When this was not possible, people were often placed in special institutions, isolated from social life, where experts assumed responsibility for their care. By the late 1970s, the social model emerged as a response to the medical approach. It assumes that disability does not result from an individual's impairment but from the barriers that society creates through unadapted spaces and a lack of systemic support. Within this framework, it is the responsibility of society to ensure equal participation for all its members. The social model became the basis for the later human-rights approach, which underpins the United Nations Convention on the Rights of Persons with Disabilities (Ružičić-Novković, 2014).

Disability can be defined in various ways, but in this study, functional classification is important, where functioning encompasses the full range of human activities — physical, mental, social, and participation. Based on impairment, disability may be categorised as physical, psychological, or multiple (Budimirović, 2024). Physical impairments include sensory and bodily impairments. The former refers to impairments of vision, hearing, or speech, while the latter involves the locomotor system, central and peripheral nervous systems, chronic illnesses, and psychomotor disorders. This research focuses on people with physical disabilities that cause difficulties in walking.

Despite the significant role of spas as places for treatment, social interaction, and recreation, spa facilities are often not accessible to people with disabilities. This assertion is well-known from firsthand experiences and the general inaccessibility of spaces worldwide, regardless of typology. However, there is no database indicating the accessibility of spa spaces. The most common barriers faced by people with disabilities include prejudice and negative stereotypes, inaccessible infrastructure, and limited access to education, employment, and social life (Budimirović, 2024). Besides the fact that spas should be accessible for social inclusion and access to treatment, they are legally required to be accessible under the Convention on the Rights of Persons with Disabilities, of which Serbia is a signatory. Mobility impairment often results in a higher degree of social exclusion, negatively affecting the physical, psychological, and emotional well-being of vulnerable social groups. This is why removing physical barriers is a key component of conventions, strategies, and action plans that set goals and establish legal frameworks for improving the status of persons with disabilities (Lalović, 2018).

Access to elements of urban structure represents one of the fundamental urban needs of modern humans. According to Prof. Dr Vladan Đokić, access to a city square can be examined from two perspectives. One relates to spatial physical access, i.e., access concerning only the morphological characteristics of the space, as well as access to certain activities occurring in that physical space (Đokić, 2009, str. 63). Improving access to the square, as well as other elements in urban and rural areas, represents one of the basic preconditions that would contribute to their better functioning. In this study, special emphasis is placed on access to activities taking place in the analysed space. The term accessibility, when used in the context of disability, implies that people with disabilities can reach facilities and use amenities without the assistance of others and without feeling like objects of charity (Michopoulou & Hilton, 2021). Accessibility represents a fundamental precondition for the full and equal participation of people with disabilities in social life. Article 9

of the Convention on the Rights of Persons with Disabilities emphasises the obligation of signatory states to take measures ensuring access to the physical environment, transportation, information, and communication, including modern information and communication technologies, as well as other services and facilities available to the public. The issue of physical accessibility is the focus of this study, as it predominantly affects the independence of people with motor impairments (Lazarević, et al., 2022). Article 9 highlights the need for a combination of various measures to embed social justice for persons with disabilities into the activities and operations of goods and service providers (Imrie, 2014). Research on the current state of accessibility in different cities worldwide and the possibilities of integrating inclusive design into local policies is needed to enable better access to assistive technologies and contribute to the inclusion and participation of all users of assistive technologies in society (Patrick, McKinnon, & Austin, 2020).

Assistive technologies (AT) refer to specialised technologies that people use to adapt the way they perform tasks. AT, combined with properly designed spaces, enable access for people with disabilities. The use of assistive technologies is accompanied by a series of challenges caused by disorganised and non-adapted buildings and outdoor surfaces. These technologies include low-tech devices, such as glasses or wheelchairs, as well as high-tech devices like IoT and smart homes (SH) (Andone, et al., 2020). The use of wheelchairs allows individuals to overcome barriers arising from physical impairments that affect walking. In this research, the alignment of infrastructure with this assistive technology will be recorded.

2.2. Case Study Selection

Sokobanja was selected as a case study based on several key criteria. First and foremost, as previously emphasised, given the importance of medical and wellness tourism, the selected spa settlement needed to have a specialised hospital or rehabilitation centre, along with wellness tourism facilities. Accessibility issues are more pronounced in settlements developed on uneven or sloped terrain, making research in such locations particularly relevant. Sokobanja met all these criteria.

3. MATERIALS AND METHODS

Research methodology is based on a mechanism for identifying activities that can contribute to improving accessibility in a report on accessibility in Mongolia (Patrick, McKinnon, & Austin, 2020). This mechanism can be applied across different sectors to enhance accessibility and is not limited solely to physical modifications in spatial design (Figure 1). The essence of this approach lies in identifying a barrier, determining the conditions and requirements for its removal, identifying responsible actors, and implementing appropriate measures in accordance with these requirements. These measures achieve the most significant effect when they are part of a broader vision of an inclusive city and rely on clearly defined guiding principles. In this research, the emphasis will be on identifying barriers, while the results will define the conditions and requirements for overcoming them.

The Crip the Campus Map project (Liebermann, 2019) demonstrates the significance of mapping as a research method that goes beyond its conventional function of spatial representation to become a tool for analysing and understanding the social, bodily, and perceptual layers of space. In this project, mapping was used to critically examine the university campus from the perspective of bodies that deviate from normative standards, thereby challenging conventional spatial representations and dominant institutional narratives. The ability of mapping to reveal the relationship between space and bodily experiences makes it a relevant method in a broader research context, especially when the goal is to identify and interpret spatial patterns that shape accessibility and usability. In this study, mapping serves as a method for identifying barriers. The research methodologically refers to the previous research (Ristić, 2024), where mapping was conducted using comparative analytical drawings and tables.

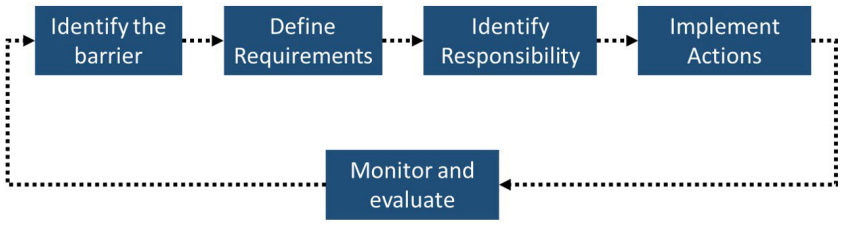

FIGURE 1. Mechanism for drafting action plans. Adapted from Patrick, M., McKinnon, I., & Austin, V. (2020). Inclusive Infrastructure Case Study 1: Inclusive Design and Accessibility in Ulaanbaatar, Mongolia. . Global Disability Innovation Hub and partners for the.

3.1. Analytical table

For systematisation, the attractors listed on the Sokobanja Tourist Organisation website were recorded. In this research, attractors are defined as services and activities that can draw tourists for medical and wellness travel. The main attractors offered by this spa settlement include nature, waters and springs, heritage, gastronomy, events, and activities. For the selection of analysed contents, they were categorised into nature, springs (Table 1), heritage, events (Table 2), and activities (Table 3).

Type	Code	Program	Distance from the SH	>2km Or <2km	Spatial characteristic
NATURE	N1	Mountain Ozren	13 km	>2km	Area
	N2	Mountain Rtanj	23 km	>2km	Area
	N3	Mountain Bukovik	39 km	>2km	Area
	N4	Mountain Devica	14 km	>2km	Area
	N5	Mountain Slemen	54 km	>2km	Area
	N6	Mountain Krstatac	18 km	>2km	Area
	N7	Lake Vrmdza	15 km	>2km	Area
	N8	Lake Bovan	10 km	>2km	Area
	N9	The Moravica River	1,7 km	<2km	Linear
	N10	Ozren picnic area	5 km	>2km	Area
	N11	Sesalac Cave	19 km	>2km	Point
	N12	Vrelo picnic area	6,5 km	>2km	Area
	N13	The spring of the Moravica River	12 km	>2km	Linear
	N14	The forest park Cuka 2	0,1 km	<2km	Area
	N15	Picnic area Lepterija	2,4 km	>2km	Area
	N16	Picnic area Vrelo-Borici	0,3 km	<2km	Area
	N17	The Sopur spring	8,4 km	>2km	Point
	N18	Ocno and Kalinovica	5,8 km	>2km	Area
	N19	The waterfall Ripaljka	5,4 km	>2km	Point
	N20	Central City Park	1,7 km	<2km	Area
	N21	Banjica park	1,5 km	<2km	Area
	N22	Oštra čuka	9,9 km	>2km	Point
	N23	God's gate	15 km	>2km	Point
BATH	S1	The Turkish bath Amam	1,7 km	<2km	Point
	S2	Bath Banjica	1,5 km	<2km	Point
	S3	Spring Market	1,7 km	<2km	Point
	S4	Zdravljak	2 km	<2km	Point
	S5	Josanica spa	16 km	>2km	Area

TABLE 1. Attractors selection- Nature, Bath

HERITAGE	H1	The Jermencic Monastery	7,1 km	>2km	Point
	H2	Ancient town of Vrmdza	12 km	>2km	Area
	H3	The Church of the Assumption of the Blessed Virgin	15 km	>2km	Point
	H4	The Homeland Museum in Josanica	15 km	>2km	Point
	H5	The church of St. Ilija	12 km	>2km	Point
	H6	Milos's Residence	1,6 km	<2km	Point
	H7	The ethno-corner of Grudonj water mills	2 km	=2km	Point
	H8	The Church of the Holy Transfiguration of the Lord	1,3 km	<2km	Point
	H9	The gallery - heritage of Milun Mitrovic	1,4 km	<2km	Point
	H10	The Homeland Museum	1,4 km	<2km	Point
	H11	The Turkish bath 'Amam'	1,7 km	<2km	Point
	H12	The medieval town of Sokograd	2,4 km	>2km	Area
EVENTS	E1	Sokobanja Summer- summer stage Vrelo	0,75 km	<2km	Point
	E2a	The Marathon of wishes- Homeland museum	1,4 km	<2km	Point
	E2b	The Marathon of wishes- Wish tree park Banjica	1,5 km	<2km	Point
	E2c	The Marathon of wishes- Spring Rujnik			Area
	E3a	St. John Celebrations- Mountain Rtanj	23 km	>2km	Area
	E3b	St. John Celebrations- summer stage Vrelo	0,75 km	<2km	Point
	E4	Green Heart Fest- summer stage Vrelo	0,75 km	<2km	Point
	E5	Sports events- location undefined	undefined	x	x
	E6	Golden hands- marble promenade	1,6 km	<2km	Linear
	E7	The first accordion of Serbia- summer stage Vrelo	0,75 km	<2km	Point

TABLE 2.
Attractors selection- Heritage, Events

ACTIVITIES	A2	Water park Podina	2,2 km	>2km	Area
	A3	Eco tourism- nature		<2km	x
	A4a	Wellness and spa- Hotel Sunce	1,9 km	<2km	Point
	A4b	Wellness and spa- Soko Terme	1,8 km	<2km	Point
	A4c	Wellness and spa- Nataly spa	0,6 km	<2km	Point
	A5	Extreme sports	undefined	x	x
	A6	Mountain biking- Rtanj Ozren	23 km, 13km	>2km	x
	A7a	Hunting and fishing- Moravica river	1,7 km	<2km	Linear
	A7b	Hunting and fishing- Lake Bovan	10 km	>2km	x
	A8a	Sports tourism- Stadium Bata Nole	1,6 km	<2km	Point
	A8b	Sports tourism- Podina fields	1,6 km	<2km	Point
	A9	Summer stage Vrelo	0,75 km	<2km	Point
	A10	Mountain climbing- Surrounding mountains	x	>2km	x
	A11	Rural tourism- surrounding villages	X	>2km	x

TABLE 3.
Attractors selection- Activities

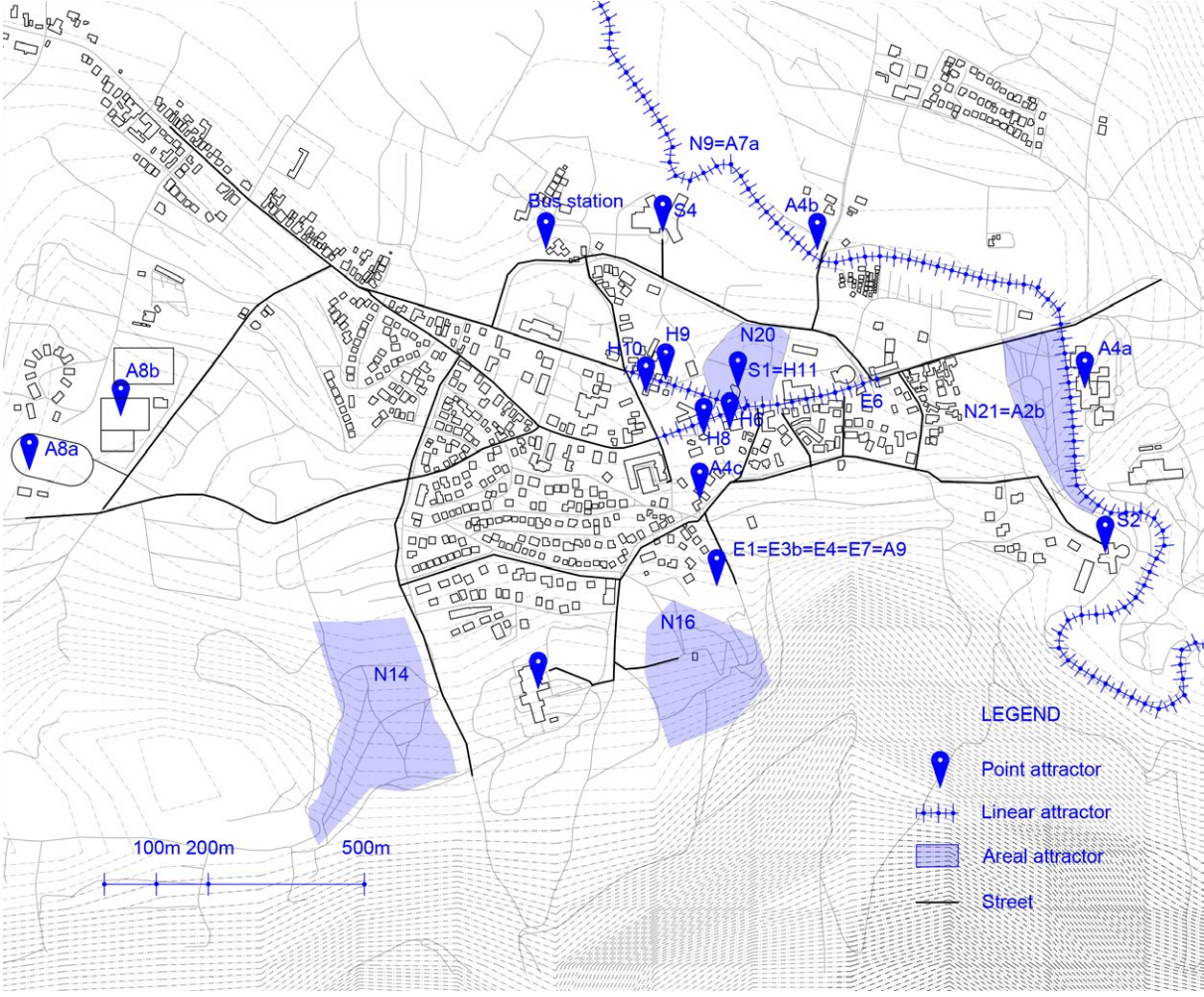

FIGURE 2. Map of streets and attractors. Source: Author illustration

The gastronomy category was not analysed because the settlement includes several restaurants both within and outside the settlement, making such an analysis less relevant for this study. The categories of attractors were compiled in tables, with each assigned a mapping code. The distance of each attractor from the Special Hospital was examined, and from the list of activities and supplements, only those within a 2 km walking or driving distance were selected. A specific criterion that was analysed is the spatial characteristic of the attractors. Attractors can be point-based, when an attractor occupies a small area; linear, when the content follows a clear path, such as a river or promenade; or area-based, such as a park or forest.

3.2. Analytical drawing

For the analysis of the systemic connectivity of the infrastructure, an analytical drawing was used. The drawing mapped the primary streets with sidewalks and attractors. Three main drawings were created: the first provides an overview of streets and attractors (Figure 2), the second analyses street accessibility, and the third examines the accessibility of attractors. The first drawing offers insight into the general structure of the settlement, while the second and third, analysed together, provide an understanding of the quality of accessibility within the settlement.

Streets represent an important communication route, connecting people with disabilities to other parts of the settlement, public institutions, and attractors, which are assigned to different categories. Due to the importance of streets in mobility, the majority are marked with a thick, solid green line to indicate passability. The inability to use sidewalks poses a risk even for people without mobility impairments. Although streets may be considered usable by wheelchair users, such communication is not entirely safe. Situations where sidewalks and streets present challenges are marked in yellow as moderately problematic. Sidewalks and pedestrian paths are significant because they constitute the only surfaces that wheelchair users can safely navigate. For point-based attractors within the urban structure, accessibility was analysed in relation to the number of steps and the presence or absence of a ramp. Accessible buildings are those that can be reached from the street level without steps or via an appropriate ramp. Accessible point attractors are marked in green. It was assumed that an average step height is about 15 cm. Moderately problematic attractors are those without street-level access but with up to six steps (90 cm), which would require an 11-meter-long ramp with one resting platform. Additionally, objects with physical access that are not clearly legible from the main entrance are also considered moderately problematic. Highly problematic attractors are those whose accessibility requires significant intervention, such as access with more than seven steps, ramps longer than 11 meters, or entrances that are too narrow, necessitating modification of the access zone.

For linear attractors, it is necessary to investigate whether they allow continuity of use and whether there are interruption points that make linearly arranged attractors inaccessible or problematic. Area-based elements must be analysed in relation to linear elements, i.e., the pedestrian paths within these areas. They are grouped into three categories: passable, moderately problematic, and highly problematic. Passable pedestrian paths are spaces that can be accessed from the street, without interruptions in movement, and with proper paving. Moderately problematic segments are those that can be easily resolved, while highly problematic segments require more substantial intervention. Moderately problematic segments include one low step, poor paving, inadequate material quality, or sidewalks with illegally parked vehicles. These are marked with a thin dashed yellow line. Highly problematic segments are areas where communication is impossible and are marked in red, with arrows indicating locations of height differences. A red arrow indicates an insurmountable height difference, a yellow arrow indicates a difference that can be overcome with difficulty, and a green arrow indicates a difference that is easily navigable. Based on the movement network, a qualitative assessment was made for area-based attractors as accessible, inaccessible, or problematic.

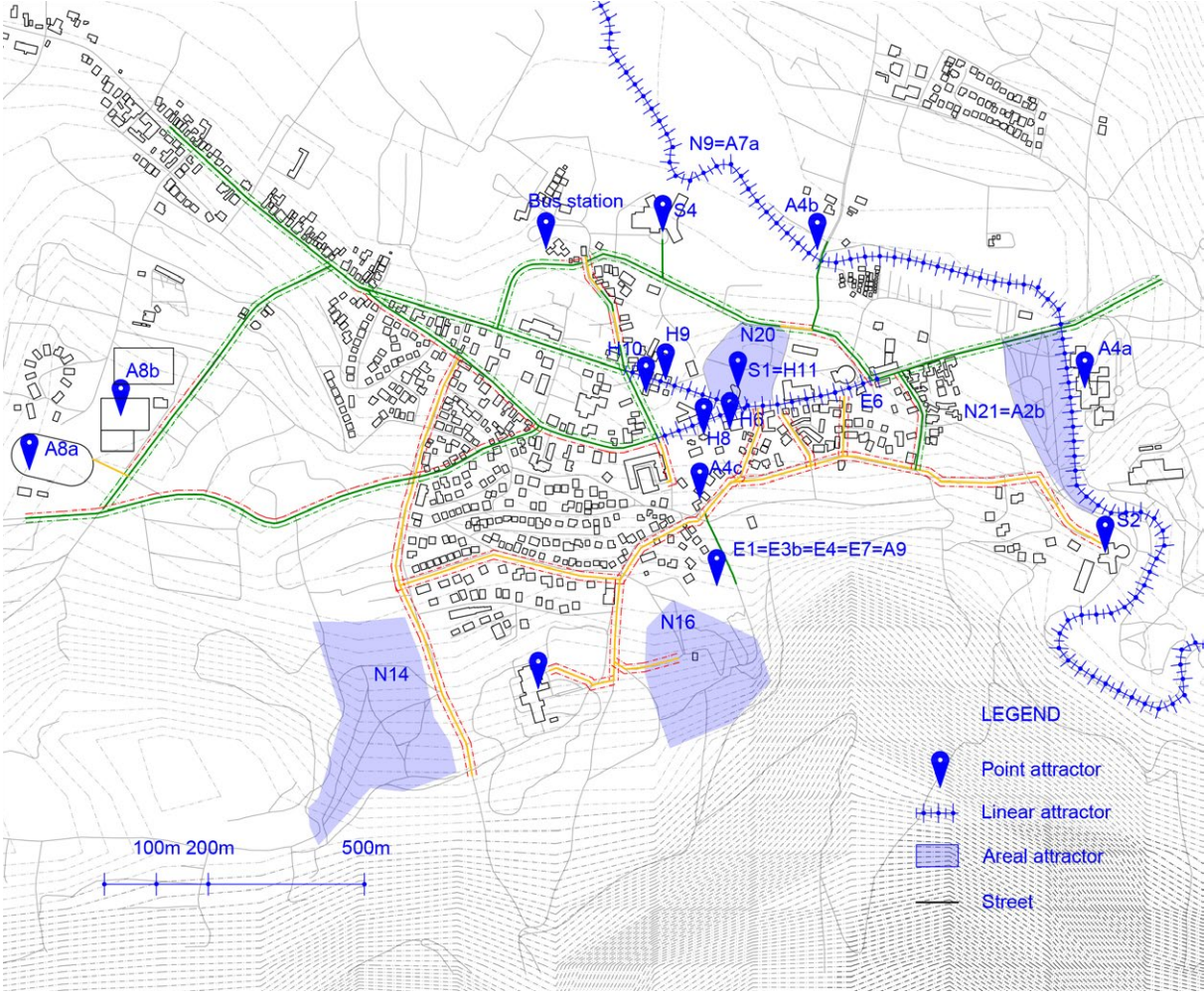

FIGURE 3. Map of the Morphological Characteristics of the Settlement and Accessibility. Source: Author illustration

4. RESULTS AND DISCUSSION

4.1. Analysis of the Morphological Characteristics of the Settlement and Accessibility

Analysis of the street layout and the evaluation of their accessibility revealed zones with functional sidewalks and zones where sidewalks are almost absent (Figure 3). Problematic areas are predominantly located where there are steep elevation changes. In a comparative study of the Cerak Vinogradi and Višnjička Banja settlements, it was observed that there is a correlation between the alignment of streets relative to contour lines (isohypses) and the accessibility of buildings. In Sokobanja, an organic street layout can be observed, following the isohypses both longitudinally and transversely. In the southern part of the settlement, near the Specialist Hospital, Forest Park Cuka 2, Picnic Area Vrelo-Borici, and Banjica Bath, streets are steep, aligned transversely to the isohypses, and lack adequate sidewalks. It should be noted that in rural areas, wheelchair use on streets is less problematic due to lower traffic intensity; however, steep slopes make streets unsafe due to the risk of loss of control, slipping, or falling.

It is also important to highlight that, despite the physical proximity of Hotel Banjica and Banjica Park on the map, there is a significant elevation difference between these two areas, and they are not spatially connected. Overcoming this elevation difference would require an elevator, which would significantly shorten the distance to access the natural areas visible from Hotel Banjica. For this analysis, the Specialist Hospital and the Bus Station were included in addition to the attractors listed on the official website. The hospital was included because distances to other attractors were measured from it. In its vicinity, there is a visually and sensorially rich health trail, which serves as an accessible linear attractor not listed on the website. The bus station was included as an important attractor because it connects the settlement with the rest of the country. The station is accessible, with no steps along the path; however, some pavement segments need restoration. Beyond architectural aspects, full accessibility would require information on which buses are wheelchair-accessible.

The central part of the settlement can be identified by a cluster of larger buildings and an accessible street layout. The linear character of the centre is evident, with one former street transformed into a pedestrian zone, the Marble Promenade. Streets in this area have gentle slopes, even paving in good condition, and systematic maintenance, allowing outdoor access to most central attractors. A critical aspect of urban layout accessibility for wheelchair users is network connectivity and legibility. The presence of dead ends is problematic and can discourage space usage. Sokobanja is characterised by a simple layout with a linear centre surrounded by circular secondary streets, which is morphologically legible and suitable for wheelchair users. Based on the terrain slope and landmarks, it is clear whether movement is oriented toward the centre or the periphery; without maps, downhill movement naturally leads to the main attractors. A notable problem is illegal parking, which obstructs sidewalks for pedestrians and wheelchair users. Addressing this issue requires systematic parking design, public awareness, and enforcement against improper parking. Table 4 presents the synthesised accessibility of the analysed attractors.

4.2. Analysis of Attractors – Heritage and Central Activities

The central area of the settlement is represented by the Marble Promenade, as evidenced by the concentration of heritage attractors in this zone, such as Miloš's Residence, the Church of the Holy Transfiguration of the Lord, the Gallery – Heritage of Milun Mitrović, and the Homeland Museum (Figure 4). The Central City Park adjoins the Marble Promenade, forming an integrated unit, with park access available from a large section of the promenade (Fig. 5).

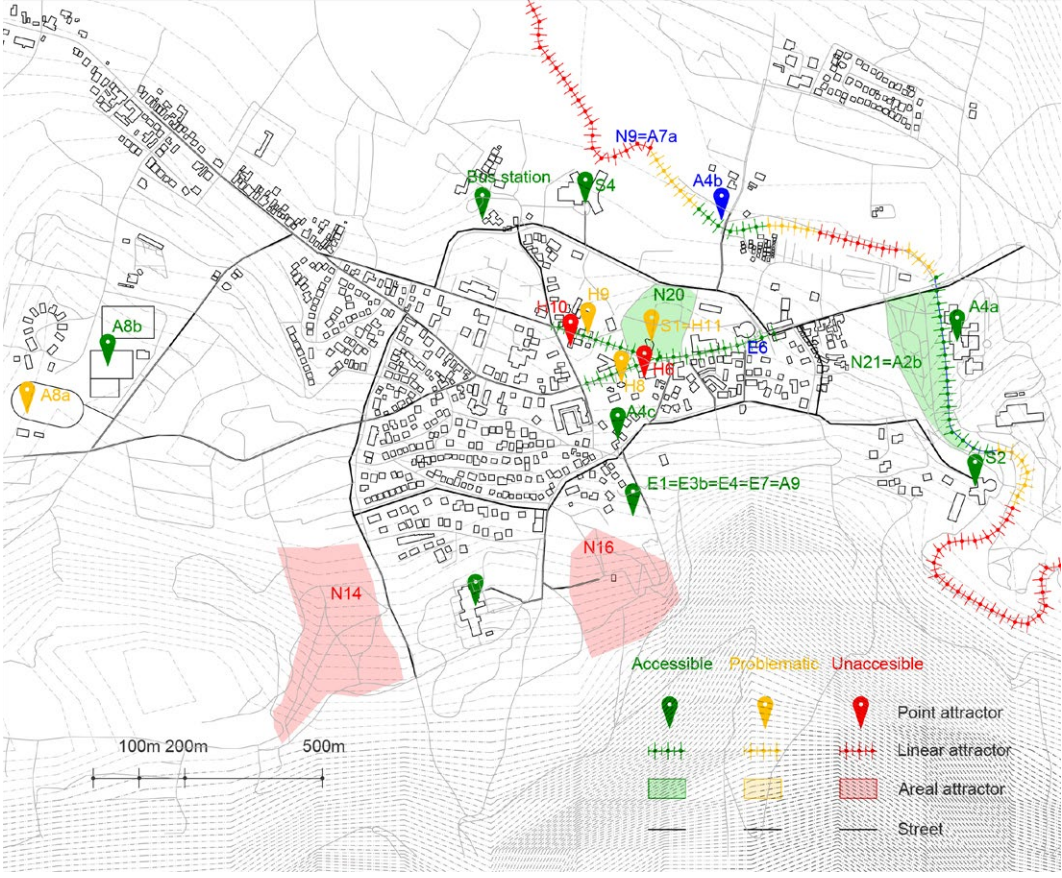

FIGURE 4. Map of the accessibility of the Attractors. Source: Author illustration

Code	Program	
N9=A7a	The Moravica River	Accessible
N14	The forest park Cuka 2	Inaccessible
N16	Picnic area Vrelo-Borici	Inaccessible
N20	Central City Park	Accessible
N21=E2b	Banjica park	Accessible
S1=H11	The Turkish bath Amam	Problematic
S2	Bath Banjica	Accessible
S4	Zdravljak	Accessible
H6	Milos's Residence	Inaccessible
H8	The Church of the Holy Transfiguration of the Lord	Problematic
H9	The gallery - heritage of Milun Mitrovic	Problematic
H10=E2a	The Homeland Museum	Inaccessible
E6	Golden hands- marble promenade	Accessible
A8a	Sports tourism- Stadium Bata Nole	Problematic
A8b	Sports tourism- Podina fields	Accessible
A9=E1= E3b=E4= E7	Summer stage Vrelo	Accessible
A4a	Hotel Sunce	Accessible
A4b	Soko Terme	Accessible
A4c	Nataly Spa	Accessible

TABLE 4 Accessibility assesment of selected attractors

FIGURE 5. The Central City Park and the Marble Promenade contact. Source: Author illustration

Along this stretch, the “Golden Hands” tourist-cultural event is organised annually. Established in 1983, the event is a competition showcasing the preparation of old, forgotten dishes and traditional crafts. Visitors have the opportunity to taste traditional Serbian dishes and purchase authentic, traditionally crafted souvenirs. Each year, over 100 participants from across Serbia take part, and more than 5,000 tourists and locals attend (TOSB, 2025m).

Regarding accessibility, this pedestrian zone is street-level, continuous, and uninterrupted (Figure 6). The street profile width allows unobstructed wheelchair movement alongside other promenade users. The smooth paving material further facilitates wheelchair use, and the quality of accessibility is reflected in the field observation of wheelchair users navigating the promenade. Some buildings along the promenade are adapted for accessibility, while others are not; however, each activity extends directly onto the promenade, making the activities along the promenade generally accessible.

FIGURE 6. Marble promenade. Source: Author illustration

The Central City Park (Figure 7) is connected to the promenade via eight access points distributed at regular intervals. Two of these accesses involve steep stairs, but due to the abundance of high-quality entrances, this is not a significant barrier. The park contains numerous benches, centennial trees providing shade, and is adorned with flowers, greenery, fountains, and sculptures. In the western part of the park is the "Sokolići" children's playground, equipped with a variety of play structures. A stream flows through the park, fed by hot mineral water from the Turkish Bath (TOSB, 2025a). The park is fully navigable and connects the central pedestrian promenade to the outer street ring.

FIGURE 7. The Central City Park. Source: Author illustration

FIGURE 8. The Homeland Museum. Source: Author illustration

The Homeland Museum (Figure 8) is located in a 19th-century building in the centre of Sokobanja, constructed in the Serbian Moravian style. With minor reconstruction, it has preserved its original appearance. The collection includes archaeological, ethnological, and historical artefacts from the Roman period to the contemporary era (TOSB, 2025l). Access to this building is highly problematic, meaning significant interventions would be needed. The ground level is arranged in an amphitheatre form, with many steps leading to the building entrance.

The Turkish Bath "Amam", (Figure 9) located in the central park, was built by the Turks on the foundations of Roman thermal baths in the 15th century. It was first renovated in 1834 by the order of Prince Miloš Obrenović, and most recently in 2005. It is the only operational Turkish Bath in Serbia and is known for a scene filmed in the movie Zona Zamfirova by director Zdravko Šotra (TOSB, 2025k).

FIGURE 9. The Turkish bath Amam.
Source: Author illustration

The Bath is accessible but is marked as problematic due to the steep slope, stone material, and lack of railing. Adapting heritage buildings poses a complex challenge, requiring a balance between accessibility and preserving historical characteristics.

Miloš's Residence (Figure 10), situated on the Marble Promenade, was built by Prince Miloš Obrenović in the first half of the 19th century for administrative purposes. The building consists of two parts: the upper floor and part of the ground floor serve as a restaurant, while the other ground-level areas accommodate additional facilities (TOSB, 2025). This attractor is marked as problematic, as adapting it would compromise its historical and ambient characteristics. Moreover, the historical quality has already been affected by multicoloured advertisements and tourist-oriented services. The Gallery – Heritage of Milun Mitrović (Figure 11) opened on June 21, 2001, at the initiative of Sokobanja's academic painter Milun Mitrović, who donated over 150 paintings. The gallery hosts various exhibitions and literary events throughout the year (TOSB, 2025d). Accessibility to this building is relatively straightforward from the main promenade; however, the entrance area features three steps without a ramp, marking it as problematic. The gallery's contents can also be appreciated externally.

FIGURE 10. Milos's Residence. Source: Author illustration

FIGURE 11. The gallery - heritage of Milun Mitrovic. Source: Author illustration

FIGURE 12. The Church of the Holy Transfiguration of the Lord. Source: Author illustration

The Church of the Holy Transfiguration of the Lord (Figure 12) , located in central Sokobanja, was built in 1892 in the Serbian-Byzantine style by Italian craftsmen, based on the design of architect Svetozar Ivacković. Serbian Metropolitan Mihailo, a native of Sokobanja, funded the project. Alongside the church, the Metropolitan built a primary school (1894) and established the first ecological society in 1895, named the "Society for the Improvement and Beautification of Sokobanja and its Surroundings." (TOSB, 2025b) The church is fully accessible to wheelchair users; however, it is marked as problematic for several reasons. The main entrance connected to the pedestrian promenade has three steps, followed by a narrow doorway and a steep ramp without a railing. Nonetheless, an alternative ramped entrance for wheelchairs exists, providing direct access to the church. Although accessible, the lack of clear wayfinding may discourage use of the space, making it problematic.

4.3. Analysis of Attractors – Nature

The primary analysis was conducted based on Tables 1, 2, and 3. From the content provided on the Sokobanja Tourist Organisation website, it can be concluded that most natural attractors are located more than 2 kilometres away, which would require the use of a car to reach them. From the perspective of accessibility for people with disabilities, these attractions are considered inaccessible, as they cannot be reached without a vehicle. This category includes mountain peaks, lakes, caves, and some picnic areas. Natural attractors located closer to the settlement include parks, picnic areas, the Moravica River, and springs. A joint analysis of the maps and tables reveals patterns between the type of content, spatial characteristics, and physical location of the attractors. Attractors involving nature are generally spatially expansive, meaning they lack clear focal points and instead encourage movement through the space. Nature can be experienced in two ways: observing from a distance or spending

FIGURE 13. Special Hospital “Sokobanja”. Source: Author illustration

FIGURE 14. Picnic area Vrelo-Borici. Source: Author illustration

time within it. Near the Special Hospital Sokobanja (Figure 13), there are Cuka 2 Park and Picnic Area Vrelo-Borici. Vrelo-Borici, located approximately 300 m from the centre, was once a fashionable excursion site frequented by famous writers, actors, artists, politicians, and members of the Karađorđević royal family. A path connects it with the Borići picnic area, which is equipped with benches, tables, and play equipment. This makes it suitable for children and adults with respiratory problems due to the high concentration of negative ions in the air (Figure 14). The site also contains a commemorative fountain dedicated to Hajduk Veljko Petrović and a multifunctional complex, the “Vrelo” Summer Stage (TOSB, 2025c). Cuka 2 Park Forest is located in the Cuka neighbourhood, near the Special Hospital. It features evergreen forest, a health path, children’s playground, wooden benches, and pavilions. The space is suitable for various sports activities such as badminton and frisbee, as well as walks and day-long outdoor stays in a beautiful natural environment (TOSB, 2025h). Both of these attractors are marked as inaccessible for wheelchair users, due to the absence of pedestrian paths through them. While access from the street allows for viewing the nature within these areas, the steep slopes and lack of navigable paths discourage active engagement.

FIGURE 15. Summer stage “Vrelo”. Source: Author illustration

The “Vrelo” Summer Stage (Figure 15) is a multifunctional facility completed in early 2020. It includes a Main Stage capable of hosting concerts, musical-theatrical performances, festivals, and other events for up to 1,500 seated and 3,000 standing attendees, while a smaller stage surrounded by a water feature hosts smaller-scale events (TOSB, 2025e). “Vrelo” Summer Stage is used as part of the Banja Summer Entertainment Program, including Sokobanja Summer, St. John Celebrations, Green Heart Fest, and First Accordion of Serbia.

Zdravljak Spring, located at the Zdravljak Hotel, is fully accessible (Figure 16). The entrance is in the middle of the terraces, with no steps or barriers, and lower-level facilities are connected via a ramped approach. Banjica Park (Figure 17), situated in the broader center along the Moravica River, is approximately 500 m from the Marble Promenade. The park is well-maintained, featuring benches, flowers, greenery, and an outdoor gym and running tracks made of tartan. The park houses the Banjica Bath, which features thermal mineral water up to 28°C and is used for treating various neurological conditions, as well as the Čoka Restaurant by the river (TOSB, 2025g). The Moravica River, 60.4 km long, is a right tributary of the South Morava River, originating at the foot of Devica Mountain. The river is rich in white fish species such as barbel, chub, gibel carp, and trout. Tributaries are clear mountain streams that are home to river crayfish (TOSB, 2025i). The river is accessible only to people with disabilities in the Banjica Park area. Two additional access points exist, but these sections are undeveloped and lack high-quality natural surroundings. The river, park, and steep hills together form an ambient unit perceived as a linear attractor, fully accessible along its length and area. Sports facilities are located on the settlement’s periphery at the Podina Sports Complex (Figure 18) and Bata Nole Stadium (Figure 19). The Podina Complex, suitable for athlete training, matches, and sports events, covers 4 ha and includes six football fields, locker rooms, showers, and a modern gym accessible to athletes, residents, and tourists (TOSB, 2025j). The Podina fields are level with pedestrian paths, with no significant elevation changes or stands. Bata Nole Stadium is accessed from street level, though the approach is currently neglected.

FIGURE 16. Zdravljak Hotel.
Source: Author illustration.

UPPER FIGURE. FIGURE 17.
Banjica park. Source: Author
illustration

RIGHT FIGURE. FIGURE 18.
“Podina” Fields. Source:
Author illustration

FIGURE 19. Stadium “Bata Nole”.
Source: Author illustration

5. CONCLUSION

The conducted research demonstrates that the spatial organisation of Sokobanja Spa partially aligns with the needs of wheelchair users and the principles of inclusive design. The central promenade and adjacent public areas, such as the Central City Park, represent relatively accessible spaces, while peripheral zones and natural or heritage sites show significant spatial discontinuities. These discontinuities arise from steep terrain, inadequate infrastructure, and the architectural characteristics of protected buildings, which limit the ability to adapt entrances and circulation routes without compromising heritage integrity.

Mapping proved to be an effective methodological tool for identifying the relationships between accessibility, spatial morphology, and assistive technology use. It provided a visual and analytical framework for recognising patterns of inclusion and exclusion within the built environment. The results indicate that accessibility in spa settlements cannot be improved solely through technical adaptations, but requires an integrated approach that connects spatial planning, infrastructure development, and cultural heritage management.

The findings may serve as a reference for local authorities in prioritising accessibility improvements and developing a digital database of accessible tourist attractions. The methodological approach can be replicated in other spa settlements in Serbia where similar terrain and heritage conditions exist. Finally, the research reaffirms the importance of aligning the physical environment with assistive technologies to achieve genuine spatial inclusion and ensure the full participation of people with disabilities in tourism and everyday life.

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THE SPRING PAVILIONS OF VRNJAČKA BANJA: MIHAJLO MITROVIC'S ARCHITECTURE BETWEEN LANDSCAPE AND CULTURE

ABSTRACT

The paper explores the spa architecture of Mihajlo Mitrović in Vrnjačka Banja through a morpho-typological analysis of the 4 spring pavilions (so called *bivete*) built in the spa park between 1970 and 1990. The spa park, conceived as the central spatial and cultural framework of the town, represents a living palimpsest where natural morphology, architectural typology, and collective memory intertwine. Within this landscape, Mitrović's pavilions function as spatial nodes that articulate the relationship between water, terrain, and built form. Through the phenomenological concept of genius loci, the research interprets these structures as architectural mediators that transform the springs into places of encounter between nature, history and culture. Each pavilion embodies a distinct morphological and symbolic response to its context, revealing Mitrović's synthesis of tradition and modernity. The study redefines the spa park as a spatial narrative of specific spa identity, where architecture becomes a medium of memory, continuity, and cultural expression.

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KEY WORDS
CULTURAL IDENTITY
ARCHITECTURAL HERITAGE
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SPRING PAVILIONS
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VRNJAČKA BANJA

1. INTRODUCTION

The spa parks of Serbia represent an important part of the country's cultural heritage, with those established in the 19th century bearing particular testimony to the beginnings of planned spatial design and the emergence of modern aesthetic values in this region. Although they marked the early stage of Serbian landscape architecture, their beauty and conceptual clarity enhanced and distinguished the settlements in which they were created. By enriching their surroundings with lavish visual and aesthetic forms, these parks emphasized the importance of improving the environment not only for purposes of health and treatment but also through the adoption of the concept of enjoyment and immersion in nature as an essential element for maintaining the human–nature relationship within the urban setting. Spa parks, as a special category with multiple roles, developed at sites of mineral and thermal springs. In addition to their primary recreational and therapeutic purposes, they hold significant aesthetic and stimulative value. Such parks are of great historical importance and belong equally to the domains of cultural and natural heritage, defining the very identity of their surroundings. This opens an additional dimension of the cultural aspect of park architecture, where maintaining continuity while preserving the specific identity of the spa becomes a matter of utmost importance.

Over the course of more than a century and a half, Vrnjačka Banja has continuously evolved as one of the most important tourist centers in Serbia and has become the largest spa town in the country. Its rich urban structure has been shaped through various developmental phases, from early examples of vernacular architecture to the complex typological forms of modern multifunctional buildings. Within this context, the park area of Vrnjačka Banja occupies a special place as one of the most representative and recognizable segments of its urban and cultural heritage. The park has played a crucial role in shaping the visual identity and distinctiveness of the entire spa settlement, while simultaneously defining its cultural and environmental character. The period of the park's most intensive formation and construction encompasses the first half of the 20th century, when, through the introduction of specific architectural elements such as spring pavilions (so called *bivete*) and spa villas, a recognizable morphological structure of the spa landscape was established. These buildings played a key role in forming the visual identity and spatial

recognizability of the settlement, contributing to its specific cultural and landscape character.

Contemporary conditions of tourism development simultaneously raise the issue of the endangered identity values of the Vrnjačka Banja area. Intensive spatial transformations, caused by modern investment pressures and the lack of a clear and applicable protection strategy, have led to the gradual degradation of its recognizable cultural and identity character. Consequently, the question of preserving and reinterpreting the historical layer embodied in the spa park as a characteristic ambient ensemble becomes crucial for safeguarding the authentic identity of the spa in the contemporary context. The study is based on the thesis that architecture, through its typological diversity, plays a decisive role in shaping the tourist experience and in valuing a place within the framework of identity. The spatial entity of the spa park has, since 2010, been declared a protected area of local character (Category III) *in order to preserve its landscape character and all natural and cultural-historical elements within it, especially the spirit and function of the spa environment*, (Ministarstvo zaštite životne sredine, 2023) its authenticity, and significance as a health, recreational, and tourist center, while in 2023 the process of its designation as a protected natural area of the second category was initiated under the title Natural Monument "Parks of Vrnjačka Banja" (Ministarstvo zaštite životne sredine, 2023).

Within this research, the spa spring pavilions are singled out as a specific subject of morpho-typological investigation within the typology of the spa park. They are identified, analyzed, and evaluated for their aesthetic, visual, and ambient qualities, as well as their distinct architectural values and characteristics. As spatial focal points within the landscaped park ensemble, the springs form a unique layer of identity within the park, serving as important nodes where the natural, cultural, and architectural heritage of the spa intertwine. In this sense, the paper is structured to first outline the historical development of Vrnjačka Banja's park system and the emergence of spring pavilions as architectural elements, followed by a typological classification based on their morphological features. Methodologically, the research relies on a combination of archival documentation, cartographic and spatial analysis, and on-site morphological mapping, which together enable a deeper understanding of the springs' evolution and contemporary condition. Through this framework, the study aims to determine how these architectural structures contribute to the overall identity of the spa landscape and how their typological and symbolic values may inform future strategies for protection, revitalization, and the reinterpretation of the spa park's cultural character.

2. THE FORMATION, STRUCTURE AND IDENTITY OF THE SPA PARK IN VRNJACKA BANJA

The park of Vrnjačka Banja was formed in the late 19th and early 20th century as part of the process of institutionalizing the spa and transforming the area around the natural thermal springs into a designed public space with exceptional tourist potential. It represents a unique entity within the system of green areas of Vrnjačka Banja, woven into the urban fabric of the spa with which it forms a symbiosis. The Austrian architect Franz Winter, who was at that time responsible for many projects in Vrnjačka Banja, designed first plans for the park in 1893. In collaboration with gardener and fellow countryman Johann Januchek, he built the first greenhouse, intended for cultivating seedlings necessary for the landscaping of the spa park (TOVB c. , 2025).

Topographically, the park occupies a funnel-shaped surface in the valley of the Vrnjačka River, whose riverbed forms an integral part of the park. It is surrounded by uneven, hilly terrain and represents the central core of the spa settlement. Its main feature is the spatial matrix defined by the course of the Vrnjačka River, which forms the main spatial axis. The park covers a total area of 24 hectares of open green space on both sides of the river, gradually extending into the urban fabric of the settlement. The terrain and the water have a crucial role in this system. To the west, the park is bordered by a promenade accompanied by a dense structure of mixed, mostly commercial buildings, followed by the terrain configuration that the park adapts to while remaining within the river valley zone. To the east, the park extends into a looser mixed urban structure of villas and hotel complexes. On the northern side, it spreads around the confluence of the Lipovačka and Vrnjačka rivers, while on the southern side it becomes narrower, following the riverbank all the way to the Snežnik spring and encompassing the surrounding park ensemble. The park is extremely rich in vegetation and contains numerous pavilions and fountains, as well as 45 outdoor sculptures by both domestic and international artists.

The tree-lined avenues of Vrnjačka Banja stretch from the Snežnik mineral spring on both sides of the Vrnjačka River, following its course all the way to the confluence with the Lipovačka River, with one branch leading toward the Slatina spring. They represent one of the most recognizable landscape elements of the spa park. Their formation took place gradually, between 1892 and 1923, indicating a planned approach to landscape design characteristic of the era. The main avenue, almost 1.5 km long, consists primarily of three species of linden trees and includes a total of 902 specimens. Together with a rich and diverse plant composition, it forms a unique horticultural ensemble of exceptional ambient and aesthetic value (TOVB c. , 2025).

From the park's current structure, it can be concluded that it consists of a series of interconnected ambient micro-units. The composition of these spatial segments represents a valuable legacy of landscape and park architecture. Within this spatial logic, a network of micro-ambiences related to various natural segments and cultural contents is formed, slowing down the movement along the longitudinal promenade axis. Within this system, the spring pavilions, together with their surrounding open spaces, stand out as distinctive reference points and spatial nodes that contribute to the recognizability, legibility, and identity coherence of the entire spa area. The park can thus be read as a spatial multi-sequence connecting the spring pavilions as 4 distinct ambient entities. Based on this, it can be concluded that the overall genesis and further expansion of the park were primarily linked to the shaping of the spring areas themselves, following the river's course and filling the natural funnel-shaped space of the river valley with separate micro-ambient units.

When considering the state of spatial development, attention must be paid to the specific sensitivity of this environment. The spa park is, above all, an integral part of the spa complex, but also a tourist oasis, and as such it must be understood as a multilayered organic entity. The spa villa stands out as a particularly important architectural typology within Vrnjačka Banja. Spa settlements, which once enjoyed the status of fashionable resorts where citizens affirmed their social identity, were the ideal ground for the emergence and development of this building type. Wealthy and distinguished citizens sought to materialize their prestige and financial power into lasting assets by engaging prominent architects to design large residential buildings, family houses, villas, and hotels (Marić, Bogdanov, & Manić, 2009). Today, among the buildings enjoying preliminary protection status, there are 84 structures listed as villas. By their composition, size, purpose, urban position, and stylistic features, this group is highly heterogeneous (Marić, Bogdanov, & Manić, 2009). Considering the pronounced ambient specificity of the spa park, the entire urban structure that gradually formed around it developed in direct relation to it, maintaining a traditional approach and a high level of spatial awareness in design. Such a tendency persisted until the 1990s, when new construction trends appeared, driven by speed in approach and decision-making. This architecture largely disrupted the spirit of the spa environment and spread throughout the spa area. Vrnjačka Banja thus acquired the outlines of an urban environment without the necessary infrastructure for such a function, while the spa park resists as a hostage of these spatial tendencies. Such conditions destroy any coherent strategy for the preservation and development of health and recreational tourism, endangering the ambient specificity of the space and undermining any initiative aimed at improving spatial culture or presenting meaningful cultural content (Obradović, 2024).

3. A PERIOD OF CULTURAL TRANSFORMATION: FROM THE SCULPTURE SYMPOSIUM TO MITROVIC'S "VRNJACKA CYCLE"

A turning point in the cultural development of Vrnjačka Banja occurred in 1965, when, thanks to the initiative of the painter and art critic Miodrag B. Protić, a native of Vrnjačka Banja, the Conference on the New Urban and Aesthetic Design of the Morava Region Towns was organized, followed shortly after by the Sculpture Symposium. In terms of cultural content as reference points within the spatial framework of the spa park, these events opened the path toward the formation of the park's artistic identity. The symposium, which gathered numerous sculptors and artists from both Yugoslavia and abroad, fostered a unique synthesis of landscape, architecture, and sculpture, further affirming the park as a space of cultural and aesthetic dialogue. In the years that followed, some of the principles developed during this conference became the foundation for a specific program of spatial culture and other cultural activities within the town. The final result of this initiative was the establishment of the Sculpture Park in open space, officially inaugurated in October 1965 (Obradović, 2022). The period that followed, marked by a series of carefully considered spatial interventions within the park, can be regarded as highly successful in terms of preserving its ambient character and enhancing the cultural identity of the space.

Miodrag B. Protić succeeded, within a relatively short period, in gathering a number of distinguished creators and experts from the fields of culture, art, and architecture to collectively improve the spa's public space. In the following years, mostly through Protić's initiative, many renowned figures from the world of art and culture contributed significantly to the reputation of the spa, including Bogdan Bogdanović, Aleksej Brkić, Uroš Martinović, Olga Jevrić, Dobrica Ćosić, Ljuba Tadić, Dušan Skovran, and others (Obradović, 2024).

Among Protić's collaborators, architect Mihajlo Mitrović stands out as a particularly important figure who, in the years to come, would leave an indelible mark on the architecture of Vrnjačka Banja. In 1965, Mitrović took part in the organization and realization of the Conference on the Urbanization and Design of Morava Region Towns and collaborated with Miodrag B. Protić in establishing the Sculpture Symposium and the Sculpture Park (Obradović, 2022). His creative engagement in Vrnjačka Banja began in 1968, when he was commissioned to develop the town's urban plan. During his early projects in the spa, Mitrović designed several key buildings in 1968, including the reception center "Putnik", the ceramic workshop Mis, and the café–confectionery Goč.

These projects would prove to be a prelude to a whole series of spa buildings designed over the following two decades. Within this twenty-year period, often referred to as Mitrović's "Vrnjačka Cycle", and according to his distinctive and unique architectural typology, four pavilions at the former mineral springs stand out: first "Topla Voda", followed by "Snežnik", "Slatina", and "Jezero". What particularly defines Mitrović's architectural work in Vrnjačka Banja, and represents an essential research question of this study, is his consistent adherence to the phenomenological concept of genius loci, which he himself recognized as the central architectural problem, especially in sensitive contexts such as this spa environment (Mitrović, 1984).

In recent decades, the expansion of construction activity in Vrnjačka Banja has endangered nearly all of the delicate cores of its public spaces, reopening questions regarding the evaluation and preservation of these spatial achievements. Consequently, the Sculpture Park, as the most sensitive segment of the spa park, has been completely neglected and no longer exists in its originally designed form. This has disrupted the previously established harmony between the sculptures, vegetation, pavilions, and open park spaces. It seems that an opportunity was missed to preserve and emphasize the park as a valuable work of cultural heritage and an example of modern spatial design.

4. MIHAJLO MITROVIC AND SPA ARCHITECTURE

The architecture of the second half of the twentieth century was marked by a profound crisis of modernism and the emergence of new "rebellious" architectural theories that sought to emphasize the fundamental shortcomings of the modern movement, primarily concerning the loss of architectural identity and the disappearance of the visual narrativity of form, that is, the overall alienated and dehumanized character of modern architecture. On the other hand, Mitrović specialized in spa architecture long before other prominent Yugoslav architects, who only became seriously interested in continental tourism facilities in the late 1970s. (Kadijević, 1999) Over a period of thirty years, he continuously built in spa towns across Serbia (in addition to Vrnjačka Banja, Mitrović's extensive architectural work in Banja Koviljača is particularly noteworthy). This body of work is exceptionally rich in imaginative architectural forms, and within these projects, erected between interwar villas and modern hotel complexes, the critic Zoran Manević recognized the "crown" of Mitrović's architectural career (Manević & Keković, 1994).

In the late 1960s and early 1970s, Mitrović designed buildings of diverse purposes. In some, he emphasized the international stylistic component, while in others he accentuated the traditional spirit corresponding to national and regional heritage, often incorporating and combining contemporary elements. This seemingly paradoxical synthesis of contrasting principles largely defined Mitrović's architectural expression, as he himself perceived architecture primarily as an art form. As a "new romantic," he was closely aligned with the ideas of both national and international historicism, drawing inspiration from Branko Tanazević, Momir Korunović, Aleksandar Deroko and Bogdan Bogdanović (Kadijević, 1999).

Mitrović followed with great attention the emergence of architectural postmodernism, which became the dominant trend in global architecture during the 1980s. He was, however, also aware of the dangers of naive "archaeological borrowings" and empty commercial quotations superficially justified by postmodern aesthetics. Although he accepted certain fundamental premises of this aesthetic, Mitrović remained faithful to the ideals of the synthesis of visual arts and an integral architectural expression (Kadijević, 1999). Postmodernism merely confirmed the results of his long-standing efforts to reconcile tradition and modernism within architecture. The reminiscences of historical styles, with which he had long been preoccupied, were effectively legitimized by postmodern practice. The unification of plastic, differently modeled volumes into expressive and imaginative compositions would define his work throughout the 1970s. This principle, akin to a sculptural methodology and partly derived from his earlier experiences, was built from striking juxtapositions of almost bizarre structures, forms and materials, and can be observed in his major works from that period.

Mitrović's work, combined with the earlier cultural and spatial concepts of the spa park's design, constitutes a unique synthesis of memory and culture, affirming the idea that the spa park functions as a synthetic space in which nature, architecture and art mutually complement one another. This cultural layer provides the space with identity, continuity and symbolic depth. Mitrović's work on the spring pavilions arises from a deep understanding of the park as a spatial and cultural whole, in which the spring pavilions become architectural sculptures that sustain the *spirit of place* and interconnect the various layers of the spa's identity.

RIGHT FIGURE. FIGURE 1: Synthesis map of Vrnjacka Banja. (Source: Author illustration, 2025)


0
100 m
200 m
300 m
400 m
500 m
600 m
700 m
800 m
900 m
Lipovačka river
Vrnjačka river
Cafe
"Goč"
Villa
"Eskulap"
Villa
"Zora"
Villa
"Gorica"
Church hill
Villa
"Jela"
Villa
"Arnovljević"
Topla Voda
Castle
"Belimarković"
450m
200m
Slatina
250m
Japanese garden
Vrnjačka river
150m
200m
Jezero
350m
Villa "Snežnik"
100m
Snežnik

5. TYPOLOGICAL CATALOGUE: ANALYSIS OF THE SPRING PAVILIONS

The pavilion "Topla Voda" abounds in the described stylistic, architectural, and artistic qualities. Its architecture features various evocations of Art Nouveau heritage, Northern Expressionism, and an almost fantastic, surreal architecture. Through a simple, transparent structure composed in a checkerboard pattern and made up of stylized and simplified historical motifs of the square and the circle, manifested through heavy concrete decorative, cantilevered, and other structural elements, Mitrović synthesizes elements of tradition and modernity in a unique way. This specific authorial design approach can be characterized as the result of two of Mitrović's key conceptual starting points. The first concerns the importance of respecting the identity of the site, phenomenologically interpreted as the *genius loci* or spirit of place, while the second is reflected in the way Mitrović models his buildings sculpturally, not concealing the key structural elements but instead giving them significant artistic expression. All these phenomena are evident and can be analyzed through Mitrović's works in Vrnjačka Banja.

The "Topla Voda" pavilion has been identified as the most significant case study within this research, as it marks the point of origin of Mitrović's distinctive stylistic language. From this project onward, his architectural expression undergoes a series of transformations, with each subsequent pavilion representing a new phase in the evolution and refinement of his formal, material, and symbolic vocabulary.

5.1 "Topla Voda" spring pavilion

In the early 1970s, an initiative emerged in Vrnjačka Banja to redevelop the main springs within the spa park through the construction plan for the first spring pavilion, "Topla Voda", located in the zone of warm mineral water near the spa bathhouse, on the site of the old spring. The spa institution "Vrnjačka Banja", the investor of the project, commissioned architect Mihajlo Mitrović, who at that time, thanks to his earlier works, had already established himself as a proven designer in the spa. This project gave him the opportunity to build his first pavilion in the central spa park, named after the spring "Topla Voda" above which it was to be constructed. The pavilion was built between 1972 and 1975. For this work, Mitrović received the Belgrade Salon of Architecture Award in 1976. The success of this pavilion, as well as the fact that Dr. Milan Babić, who lived, worked, and in his later years managed the spa institution, was deeply dedicated to the development and aesthetic improvement of the spa, opened the way for Mitrović's subsequent works in Vrnjačka Banja. Babić,

who described himself as a "peasant's child", was profoundly connected to his homeland, and through his lifelong commitment to the enhancement of spa treatment and the beautification of the spa environment, became one of the key patrons behind Mitrović's major projects (Kadijević, 1999).

The "Topla Voda" spring pavilion was planned at an attractive location in the central part of the park, on the site of the old pavilion and the former warm spring. At the time of planning, the spring was covered with a simple wooden structure built in the traditional Morava style, with arcades and colonnades (according to old photographs; see the postcard at Figure 7). Having a distinctive sensitivity for recognizing the characteristics of the project site, this detail became very important to Mitrović. When designing "Topla Voda," and later other pavilions (most notably the "Slatina" pavilion), he decided to retain and reinterpret many traditional spa architectural elements and associations within his projects.

The new pavilion was designed as a single-story structure with a basement level connecting it to the nearby bathhouse, primarily intended for the collection and use of healing spring water. The position of the "Topla Voda" pavilion is such that it is accessible from all sides and freely placed within the park greenery. Modest in size, of simple rectangular form measuring 17 meters in width and 27 meters in length, and distinguished by four cylindrical corner towers of identical diameters of 4 meters but of varying heights that do not exceed the surrounding treetops, the pavilion exudes a fairytale-like elegance within its wooded environment. The building has no main façade but is spatially defined by the placement of the corner towers, the tallest of which is representatively positioned on the southeast side, facing the adjacent bathhouse and the central park area. Although simple in plan, the pavilion's location near the bathhouse and on sloping terrain above the river level prevents its façades from being viewed frontally in their entirety. Instead, the visual emphasis lies on the prominent corners with towers whose differing heights, together with the diagonally positioned gable roof descending toward the front, create an illusion of visual incompleteness and ambiguity in the perception of the building's full volume.

The four dominant corner towers are designed to resemble stylized chess pieces of monumental proportions. They are made of concrete, clad in brick, and extended with almost sculptural elements of exposed concrete. At the upper ends of the towers, the concrete is combined and partially covered with copper sheet. Copper was also used to cover the gable roof, as well as for the cornices and gutters. Traces of the then-contemporary architectural brutalism

are evident in the treatment of heavy, enclosed masses and in the interplay of superimposed motifs that alternate with brick surfaces both inside and outside the building. On one of the towers, the one facing the central park area, a concrete frame with a clock emerges from the brickwork, serving as the main visual motif toward the park. Below the clock, there is a small circular window with a flat vertical concrete console element centered above it. On the adjacent tower to the south, there is another small window, this time without concrete details, clearly positioned toward the less visible rear side of the building. The remaining two towers have no openings and contribute to the building's monolithic and monumental visual impression with their brick cladding.

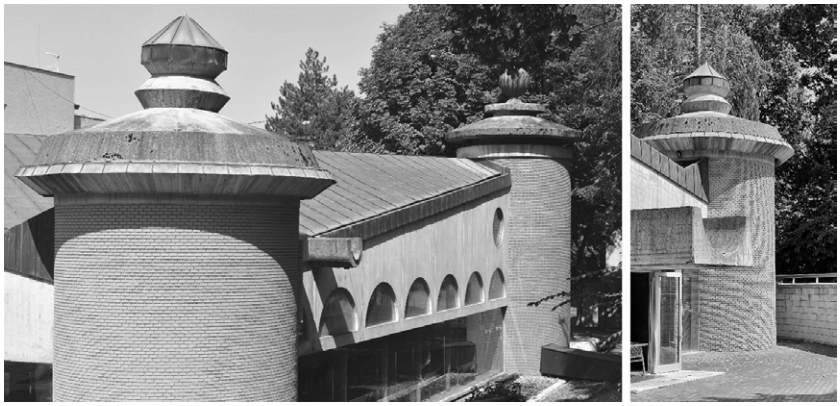

FIGURE 2: "Topla Voda" pavilion in Vrnjacka Banja. (Source: Author, 2024)

Between the towers stretches a central rectangular, transparent, and spacious area covered with a gable roof, richly decorated with different materials and dominated by a diagonally placed massive concrete beam. The program of the spring pavilion is simple, consisting almost entirely of a single open interior intended for the use and access to the spring water, while all auxiliary spaces are located within the corner towers or in the basement area that houses pumps and other technical installations. Two entrances were designed, the main one on the southern side and a secondary one on the northern side. The entrances are slightly projected from the façade line and stylistically follow the circular geometry of the towers. Above them are cantilevered canopies composed of concave superimposed concrete elements. Both long façades are transparent. In the upper zone between the towers, a perforated concrete cornice reflects the form of arches (arcades), followed by a colonnade of steel pillars with glass panels between them. According to the technical description and reports (as seen in: Arch. Mihajlo Mitrović, Main Design Project from 1972 for the "Topla

Voda" Pavilion in Vrnjačka Banja), the interior walls are of exposed concrete, plastered, painted, or clad with grouted brick or ceramic tiles. Some walls retain grouted brick or are covered with wallpaper. The floors are made of marble or ceramic tiles.

The project envisaged that the main entrance, oriented south toward the park, would lead into the ground-floor space where the spring outlets are located, while the exit, placed on the western side toward the bathhouse, consists of two single doors opening onto a narrow raised platform with a small staircase descending to the level of the forecourt in front of the spring, facing the bathhouse complex.

The central space is exceptionally well-lit, with glass walls extending along both sides of the building (from tower to tower), creating complete transparency. The floor is made of polished white marble, which, in combination with the natural light entering from the park, enhances the ambient quality of the space, producing reflections reminiscent of water. In contrast to the white marble floor, six dark marble drinking fountains are arranged in the central area in a concentric circle with a diameter of 10 meters, positioned at the very center of the space. The ceiling of the main hall is clad with dark elm planks following the slope of the roof. The entire room is very tall, with a varying height depending on the roof's inclination, reaching a maximum of 7 meters according to the plan. In its central and highest part, a diagonally placed oversized load-bearing concrete beam measuring 70 by 140 centimeters in cross-section spans between two towers, creating an outstanding sculptural effect within the open ground-floor space. From this beam, large spherical white glass lamps are suspended on steel rods, further contributing to the spatial ambiance and perceived depth.

In the northern part of the building, there are two spiral staircases clad in striking dark greenish-blue decorative ceramic tiles, descending into the basement level. Through the use of the spiral staircase, Mitrović once again emphasizes the circular form, logically complementing the geometry of the adjacent towers. Next to them, concealed by a wall clad in grouted brick, is the secondary northern entrance. Extending from the entrance is an access corridor lined with decorative ceramic tiles, serving as an isolated passageway leading to the other two towers. Another warm-water fountain is located here, in the tower oriented toward the bathhouse, while the opposite tower contains a designated seating area.

On the opposite, southern side of the building, the right-hand tower was designed as a room for distributing drinking glasses, with a small upper level serving as storage, while the left-hand tower (facing the bathhouse), which is also the tallest of the four, was designed as a kiosk, that is, a souvenir shop and workshop, with an upper gallery and direct access to the basement level via a spiral staircase positioned within the tower.

The geometry of the "Topla Voda" pavilion is almost entirely based on various interpretations of circular and square motifs. The main homage to the Art Nouveau style is expressed through the design of the souvenir shop entrance at the base of the pavilion's most prominent "Clock" tower. The door design unmistakably recalls the famous entrance to the "Glassmaker's House" in Brussels, one of the most celebrated examples of Art Nouveau architecture.

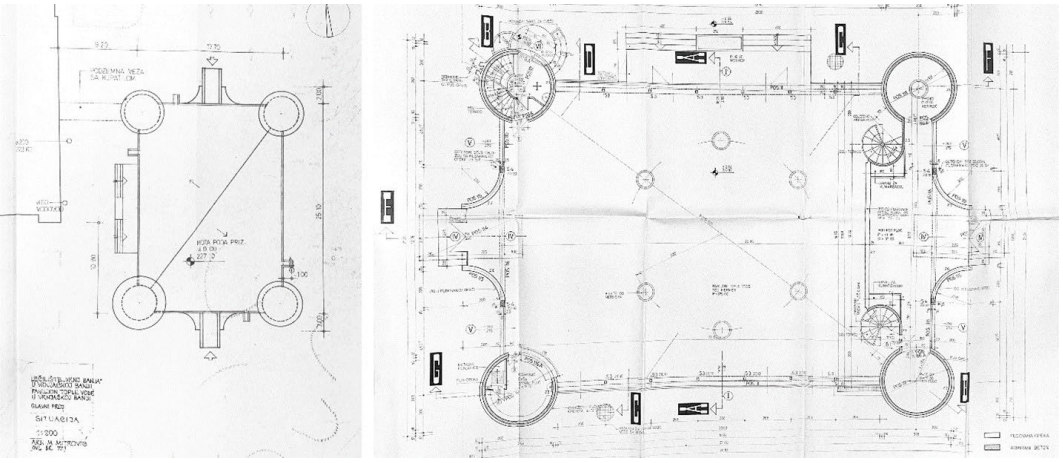

FIGURE 3: Situation and ground plan of the "Topla Voda" pavilion in Vrnjacka Banja. (Source: Historical Archives of Kraljevo, 2024)

The building as a whole appears harmonious, although it is essentially an expressive amalgam of diverse forms and monumental structures characterized by unexpected artistic and sculptural qualities. The arched, cylindrical, circular, oval, and triangular motifs, interpreted through both the general form and structural details of the building as well as through façade and interior elements, create highly unusual architectural scenes, suggesting the presence of deliberate constructive metaphors. The exterior treatment is enriched with contrasting elements of primary and secondary plasticity. The interior, rich in volume and

artistic detail, captivates with its romantic appearance. It can be concluded that Mitrović created a building of almost sculpturally modeled silhouette. With its extraordinary form, the pavilion gives the spa park a visual sense of romantic and fairytale-like atmosphere. The old spa pavilions and bathhouses, mostly built with central domed volumes complemented by lower annexes, charming colonnades, and arcades, are vividly evoked in this and later works of Mitrović in Vrnjačka Banja.

Additionally, between 1987 and 1989, Mitrović had the opportunity to reconstruct the old Roman spring "Fons Romanus Revidivus", which had been unjustly buried after World War II and was located in the immediate vicinity of the "Topla Voda" pavilion, thus forming a unique visual ensemble together with it. The spring consisted of two single-flight marble staircases with the original pre-war balustrade descending to the spring level. Mitrović covered this Roman spring with a glass pyramid, a popular interpolation motif in world architecture of the late 1980s. However, during the reconstruction of the spring in 2015, the pyramid was removed, and the Roman spring was redesigned, acquiring a completely different contemporary appearance.

With the "Topla Voda" pavilion, Mitrović began his exploration and experimentation with the forms of spa spring architecture, which would later manifest spatially in his diverse interpretations of historicist architectural elements. By following the continuous transformations of form and detail in his pavilion designs, one can trace the influence of the ornate spa Art Nouveau style and observe its gradual evolution toward renewed monumentality, expressiveness, and sculptural form.

FIGURE 4: "Topla Voda" interior. (Source: Author, 2024)

5.2 “Snežnik” spring pavilion

The pavilion “Snežnik” was built between 1978 and 1981. It is positioned at the southernmost point of the park, directly on the bank of the Vrnjačka River. The new pavilion replaced the old circular wooden spring structures. In this case as well, Mitrović used the form of the previous pavilion as the main motif. This time, the plan is circular, characterized by a stepped circular attic cornice from which glazed fields descend like drapery. The building is situated on a highly specific and narrow terrain morphology, positioned between the descending slope and the river course. The area surrounding the spring is designed to follow the form of the pavilion from all sides, softening the slope descending from the hillside toward the building and the river. The platform is filled with planters, benches, and light fixtures designed in accordance with Mitrović’s expressive architectural language.

Glass and solid wall surfaces alternate rhythmically, creating a special effect of transparency that gives this pavilion its distinctive visual identity. The entire geometry of the pavilion is once again based on the interplay of the circle and the square. Similar to the “Topla Voda” pavilion, Mitrović also used brick cladding here (this time in white), combined with concrete and glass. Above the structure rises a cylindrical tower adorned with a narrow central window containing a clock, reminiscent of the “Clock” tower of the previous pavilion. Over the central part of the structure emerges a stylized cylindrical lantern.

Aleksandar Kadijević observed that the main idea of the building is reflected in the expression of its structure and in the way the terrain is shaped around it, similar to the works of Mitrović’s contemporaries, such as Mandić in Prizren and Užice, and Martinović and Petrović around the Terazije Fountain in Belgrade. (Kadijević, 1999) The circular central space around the drinking fountains is covered with a light structure made of slanted, thin lattice beams converging toward a central mushroom-shaped capital of the main column, evoking an almost classical monumental aesthetic. Just as in the case of the “Topla Voda” pavilion, where the main diagonal beam plays an essential ambient role in the central space, here the same role of a central sculptural element is assumed by the main column, whose form and position dominate the interior.

“Snežnik” achieves radial transparency and visual dialogue with its surroundings and tree-lined avenues, acting as a spatial focal point of open vistas from which, following the Vrnjačka River northward, the park structure gradually unfolds.

5.3. “Slatina” spring pavilion

The third spring pavilion, “Slatina”, is the result of Mitrović’s Art Nouveau inspiration. It was built in 1985 and is located along the roadway that follows its length. The approach to the pavilion is designed ceremoniously, reminiscent of the spatial compositions in Bogdanović’s memorials, giving visitors the impression of entering a sanctuary. (Kadijević, 1999) This unusual stepped, plastic “forecourt” leads the visitor into an elongated cruciform space covered by a low blind dome and wide overhanging eaves. The building fully follows the gentle terrain gradient, allowing visitors to descend toward the water in an almost ritual manner. The surrounding platform, similar to that of the “Snežnik” pavilion, is arranged on all sides and furnished with highly expressive architectural elements and outdoor furniture characteristic of Mitrović’s design style. Unlike “Snežnik”, “Slatina” is more introverted: it is enclosed toward the exterior, focusing on its inner ambiance. Sculptures surrounding the pavilion on all sides complete the scenography of its extraordinary micro-environment. Along the stepped approach to the pavilion, slender columns with lamps inserted into narrow recessed niches rise from cubic low planters.

Shallow, fantastic, and floral motifs are carved into the inner surfaces of these niches. Between the planters there are rhythmically interspersed benches, creating a harmonious alternation of architectural and functional elements. Subtle contrasts of light and dark surfaces evoke the romantic atmosphere of the pavilion’s interior, further enhanced by masterfully crafted stained-glass windows that panoramically depict the old vistas of the spa. The central space is designed so that the drinking spring is placed at a lower level, requiring visitors to descend into a recessed circular area to reach the water. Within this space stands the central fountain, integrated into an abstract sculpture by Miodrag Živković. The distinctive atmosphere of the interior is further enriched by variously shaped supports holding bright white spherical lamps, similar to those in the “Topla Voda” pavilion.

It can be concluded that the entire structure carries numerous memories and recollections of the old spa architecture that flourished in Europe at the end of the nineteenth and the beginning of the twentieth century. With the “Slatina” pavilion, Mitrović’s fascination with Art Nouveau motifs reached its culmination, achieving an entirely new, original, and unrepeatable transposition of the spirit of historical stylistic forms into the modern sensibility of his time.

5.4. “Jezero” spring pavilion

The last of Mitrović’s pavilions in Vrnjačka Banja, named “Jezero”, was built in 1990, with preparatory work beginning as early as 1987. The pavilion is situated on the shore of a small artificial lake, its green hue harmoniously integrating with the surrounding landscape and enhancing the natural composition of water lilies. This work represents the most stylistically liberated of Mitrović’s spa structures. Having by then “forgotten” his Art Nouveau–inspired Slatina, he revived his earlier inclination toward expressionist and experimental gestures. The “Jezero” pavilion has a monolithic, pyramidal contour animated by striking contrasts between protruding and recessed segments, solid and void masses, and rectangular, rounded, and curved surfaces.

From a visual standpoint, Aleksandar Kadijević argues that the pavilion synthesizes elements of Mitrović’s entire “Vrnjačka cycle,” as it unites the structural and expressive qualities of “Topla Voda”, the classical rigor and monumentality of “Snežnik”, the “neo–Art Nouveau” lyricism of “Slatina”, and the pyramidal motif from the Roman spring. (Kadijević, 1999) The roof, covered with traditional green Art Nouveau tiles, is dramatically emphasized by large, modernist glass windows. Coloristically close to “Slatina”, the polymorphic mass of the “Jezero” pavilion expands visually in all directions, merging with both the water and the surrounding greenery. In the interior, just above the drinking fountains, another monumental sculpture by Miodrag Živković is installed, further reinforcing the artistic and spatial synthesis that defines Mitrović’s late spa architecture.

FIGURE 5: Variable stylistic characteristics of the 4 Vrnjacka Banja pavilions, from left to right: “Topla Voda,” “Snežnik,” “Slatina,” “Jezero”. (Source: Author, 2024)

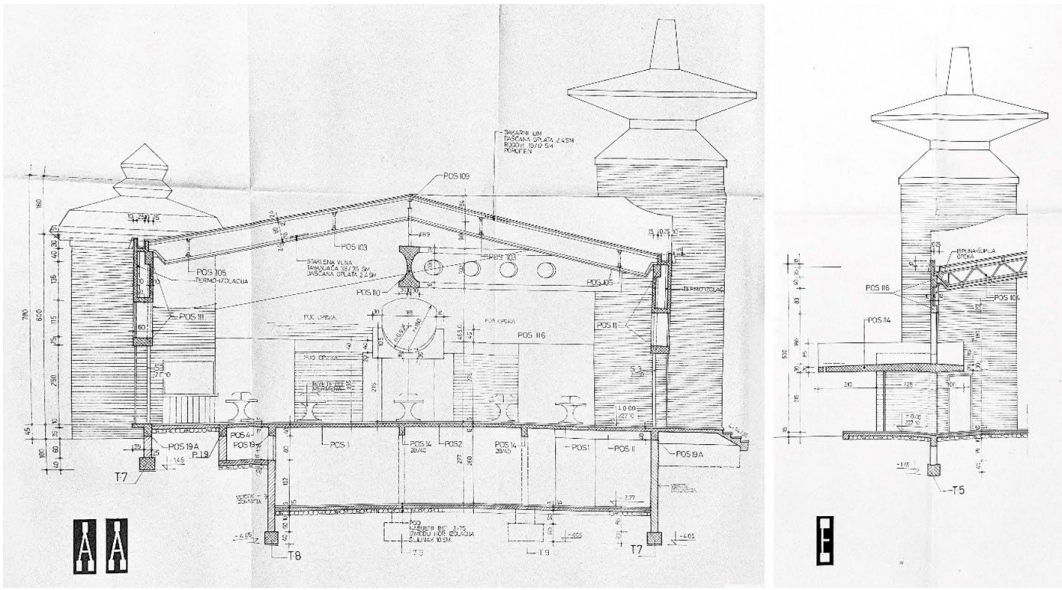

FIGURE 6: Characteristic cross-sections through the "Topla Voda" pavilion. (Source: Historical Archives of Kraljevo, 2024)

6. SYNTHESIS - THE SEMIOTIC LINK BETWEEN THE OLD AND THE NEW

In the case of the spa pavilions, it is not unusual that through their form and spatial atmosphere, Mitrović's architectural expression and spiritual understanding of space transcend mere utilitarian value. In this sense, it is important to emphasize that his unique architectural fusion emerged precisely at a time when architectural discourse in Yugoslavia was critically reassessing the modernist style of the 1950s and 1960s, particularly the International Style, which was often viewed as being detached from the history and culture of the places where buildings were erected. As a result, many architects sought to integrate components of "regionalism" into their works, taking into account the history of a site, tradition, and vernacular heritage. One of the outcomes of such reinterpretations of improvised traditional motifs and historicism was the emergence of an architectural tendency that equated the constructive and the artistic components of design (Radović, 1995). This was an architecture that arose as a response to the monotony and visual anonymity of the International Style, asserting sculptural form as a primary principle of architectural expression. These efforts eventually culminated globally in the rise of postmodernism, which achieved full recognition during the 1980s.

According to Mitrović himself, the primary challenge he faced when designing in Vrnjačka Banja was the complex phenomenological concept of *genius loci* (Mitrović, 1989). Human space, not only urban space, has always been a field of signification and meaning. The relationship between the elements that constitute a city, its specific context, can be interpreted as a kind of writing, as the inscription of human presence into space and the creation of a distinctive and unique *image of the city* (Lynch, 1974). Architecture thus becomes a medium of communication through which legibility is achieved. In this communicative process, architecture can be understood as a unique nonverbal language, while buildings themselves function as signs, as spatial units that, analogous to linguistic structures, convey meaning. This architectural language reveals the problem of the genius loci, or spirit of place, a concept that Christian Norberg-Schulz bases on the relationship between humans and their environment as determinants of every individual context in an authentic and singular way (Norberg-Schulz, 1980).

The complex concept of "*place*" in this context can be understood as the existential field of architecture and its surroundings, as the condition of spatial events. Unlike abstract space, place provides context and specific meanings; it is the product of experience and encompasses physical, aesthetic, historical, cultural, and symbolic dimensions. Since the essential characteristic of place lies in the presence of architecture, or potential built form, it follows that each place is defined by its unique configuration of landscape, physical setting, and spatial relationships - factors that shape its distinction from any other. From this arises the hypothesis that contextualization forms the foundation of every new architectural concept, which must seek to adapt to its context, and that the meaning of an architectural form should emerge from interpreting and responding to the pre-existing event, that is, *the place* itself.

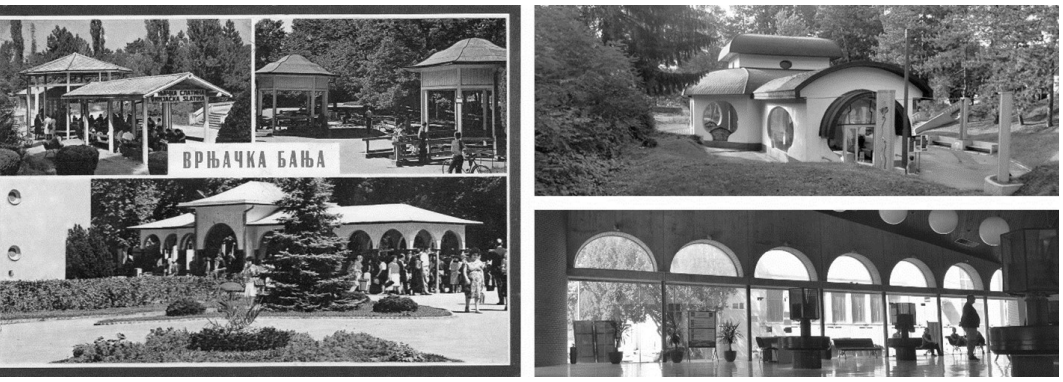

FIGURE 7:

Left: An old postcard from Vrnjačka Banja showing the former pavilions "Topla Voda" and "Slatina"; upper right: "Slatina"; lower right: the colonnades of "Topla Voda". (Postcard source: spomenikdatabase; Photo source: Author, 2024)

In the context of Vrnjačka Banja, the question of architectural identity is particularly sensitive. The settlement originated on the site of the original village of Vrnjci, and its early construction style was rooted in vernacular building traditions. Over time, especially in the early twentieth century, with the arrival of more visitors, particularly doctors and engineers educated abroad, the entire identity of the village began to change. These visitors brought with them aesthetic norms and values shaped by the places where they had studied or lived. The decision of prominent figures of that time to invest in Vrnjci led to the rapid construction of luxurious holiday villas and hotels, transforming the area into an elegant spa environment (TOVB a. , 2025).

Mitrović, aware of the responsibility inherent in redefining spa architecture, identified two key questions as central to his conceptual approach: *the spirit of place* and *the need to strengthen the relationship with spa tradition* (Mitrović, 1989). He emphasized that *every place has its own precise requirements, conditions, and specificities*, and that *the architect's primary task is not to violate the integrity of the place, but rather to, through respect and understanding, engage with it only as much as the place itself allows* (Mitrović, 1989). Mitrović aimed to extract those elements "validated by time" from pre-war spa tradition and reinterpret them in a new visual language suited to contemporary architecture.

However, the refined atmosphere of the old spa milieu could neither be fully restored nor replicated, as Mitrović himself noted: *It belongs to the past times* (Mitrović, 1989). The noble world that once shaped Vrnjačka Banja had long vanished from the historical scene. Yet, traces of that bourgeois refinement endure in the decorative architecture of the remaining villas, pavilions, and hotels.

What arises as a central question here is the design logic and the relationship between *spirit of place* and *style*, that is, whether and how the valorization of the *genius loci* concept can influence the formation of entirely new but contextually appropriate architectural expressions. The spirit of place should not lead to imitation or literal reproduction of historical architecture. Its relevance lies not in the fidelity to historical or stylistic forms but in its contribution to the continuity and enhancement of the spa's distinctive atmosphere and identity. *The combination of old and new must remain meaningful only if it is reinterpreted in new ways, while tradition serves to affirm and inspire what is contemporary* (Venturi, 2008). This dialectical interplay between the universal and the regional, the traditional and the avant-garde, becomes the condition for architecture's survival.

This issue remains highly relevant today, but an examination of the history of spa architecture reveals that it was already recognized by the mid-twentieth century, when the expansion of spa facilities introduced a wave of new, often contextually *inappropriate* (Venturi, 2008) architecture that disrupted the stylistic harmony of the historical spa environment.

Mitrović's "Vrnjačka cycle" ultimately demonstrates how a distinctive architectural language can emerge from the inventive reinterpretation of tradition. By transforming historical motifs into expressive geometric forms uniquely attuned to the spa landscape, Mitrović achieved a synthesis that was both original in the Yugoslav context and deeply rooted in local cultural memory. His tectonic approach, particularly visible in the symbolic corner towers of "Topla Voda," reveals a deliberate layering of meanings through which past and present, play and monumentality, ornament and abstraction converge into a coherent architectural narrative. The poetic interplay of brick and concrete, the sculptural massing, and the evocative use of symbolic quotations all show his capacity to construct polysemantic spaces capable of sustaining multiple readings. In this way, Mitrović forged a personal model of synthetic imagination that integrates diverse temporalities into a unified and timeless architectural expression. His pavilions in Vrnjačka Banja therefore stand as exemplary instances of how modern architecture can meaningfully engage with cultural heritage by activating the phenomenology of place and enriching the identity of the spa landscape.

FIGURE 8: “Clock” tower of “Topla Voda”. (Source: Author, 2024)

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THE SPRING PAVILIONS OF VRNJAČKA BANJA: MIHAJLO MITROVIĆ'S ARCHITECTURE BETWEEN LANDSCAPE AND CULTURE

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THEORIES OF LEISURE - IMAGINING THE FUTURE OF FREE TIME THROUGH THE CASE OF MATARUŠKA BANJA

ABSTRACT

The paper explores the notion of leisure as an instrument that reflects social circumstances and shapes architectural conceptions. It traces the genesis and transformations of leisure across socio-historical contexts to examine its manifestation in architecture - from the ancient scholē, through industrial work hours and socialist vacation models, to the contemporary information society and post-work scenarios. The first phase of the research consists of an interpretative-historical and theoretical analysis of architectural theory sources to understand how leisure was defined and redefined in each period. The second phase adopts a design-based research approach through a case study of the "Žiča" hotel project by architect Milan Zloković, a paradigmatic example of early Yugoslav modernism. Original drawings and relevant secondary sources are analysed to examine how leisure was materialised through architectural programme and modernist language, revealing underlying social assumptions. Using visual collage as an interpretive tool, conceptual connections between historical layers of meaning are established, enabling a Research through Design phase that proposes a future vision of leisure. The aim is to demonstrate architecture as a medium for anticipating new futures of leisure.

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KEY WORDS
LEISURE
VACATION
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MODERNISM
ŽIČA HOTEL
LEISURE AS AN ARCHITECTURAL PROBLEM

1. INTRODUCTION

The notion of leisure is a complex social and architectural phenomenon whose meaning evolves alongside changes in social, economic, and technological structures. In Serbian, colloquially, it is understood as a state of passive rest or idleness, whereas historically it has functioned both as a spatial category and as a dynamic indicator of social relations, cultural values, and economic priorities.

In contemporary society, leisure is continually transforming under the influence of digital infrastructure and algorithmic systems that redefine the boundaries between work and leisure. As technology frees us from traditional tasks, it simultaneously opens possibilities for new forms of surveillance, fragmentation, and psychological strain. The threshold between time free of obligations and time extracted from it becomes increasingly blurred as algorithms, screens, and digital content shape our perception of leisure.

The research focus of this paper is on understanding these transformations through a comparative analysis of historical and contemporary leisure practices. One of the key elements of the study is the case study analysis of Hotel 'Žiča' in Mataruška Banja, built in 1932 according to the design of Milan Zloković.

Methodologically, the work combines historical-interpretive analysis with the experimental approach of Research through Design. Through the interpretative tool of visual collage, various historical layers of the meaning of leisure - recognised in literature, film, art and cultural theory - are visually connected with architectural manifestations and spatial practices.

The aim of the work is to show how leisure functions as a social and cultural phenomenon that shapes architecture, and to explore and articulate the future of leisure time through architectural interventions. The final project, a design experiment, creates an environment in which the past, present, and future of leisure converge in an open architectural imagination. The results of the research

indicate that leisure is not simply the absence of work, but a key field in which society is reflected and shaped. Architecture becomes a tool and medium that materialises this transformation, contributing to the understanding of leisure as a concept and practice that is simultaneously philosophical, social, and spatially relevant, and providing foundations for designing architecture that reflects and shapes free time in the twenty-first century.

2. THEORETICAL-HISTORICAL FRAMEWORK OF THE CONCEPT OF LEISURE

2.1. Pre-industrial society

In the article 'Leisure as an architectural problem', published in The Architectural Review in 1938, architect and assistant editor - Donald Pilcher in the same magazine, opens a discussion about how the changes that occur in the structure of the daily life of workers in the process of industrialization become an architectural problem through modifications in the meaning of the concepts of free time and leisure. Before the emergence of factories, there was no clear structure in the relationship between working time and rest time within a typical timeframe, such as a day, month, or year, because this relationship was regulated organically within the family, guild, Church, or community life organized by religious dynamics. With the creation of factories, work is displaced from the household, and thus working time is separated as a rounded structural unit of everyday life. Free time, therefore, arises here as a consequence of the clear separation of the working time of the individual in the industrial city, as a residue or what happens after the time structured by utility. Thus, free time and especially leisure acquire a certain negative connotation, as a part of the day that is not used for the purpose of production. This new modification, free time, as the residual time left free of obligation, contrasts with free time, as excess time, abundant with creativity, thinking, and creation, as we knew it before industrialization.

Free time, necessary for creative processes, is referred to as the term leisure with minor variations, from the ancient man and the term scholē (which stands at the root of the English word school and Serbian škola), to the period of industrialization, and implies and encompasses rest, leisure, and learning at the same time. Leisure is the time development or thinking that arises through dialogue or spontaneous conversation within spontaneously formed groups. We can see that for the ancient man, leisure was a time freed from work, when basic needs were satisfied, thus leaving space for logical reasoning, creativity,

inspiration, and creation. In this way, leisure time becomes necessary because, according to Aristotle, it is a prerequisite for thinking. Only when man frees time from work and necessity, in the absence of obligation, can he turn to questions of cause, meaning, and truth. Along this line of meaning, the time left for thinking and creation, the time that is permitted, allowed, is in Latin the word licēre, which etymologically lies at the root of the word leisure. Therefore, leisure is not only the absence of work, but a prerequisite for developing a life of thought.

In a feudal and agrarian society, based on agriculture and manual labor, the structure of life was dictated by seasonal cycles, ritual, and community, and the rhythm of everyday life. Life was not yet divided into strictly defined segments of work and free time, and work and rest did not exist as two separate categories, but as one continuous flow of life where periods of effort and pause circulate within the same day. Free time is occupied by community rituals and being in nature. Storytelling becomes the essence of the community's free time, a way of leisure, and a source of new experiences. Within this storytelling, narration becomes a space of gathering, imparting wisdom, and a way of experiencing the world through other people's stories. That is, the very act of narration, ethical or artistic experience, becomes an act of shaping society.

Pieter Bruegel the Elder's painting Children's Games (1560) depicts a similar corporeality of everyday life: outdoor feasts, play, and communal celebration. In these scenes, work has not disappeared, but is sublimated in ritual, in the village festival, in events in which community is renewed through the body and natural.

FIGURE 1. A depiction of pre-industrial leisure, Pieter Bruegel the Elder, Children's Games, 1560.(Bruegel the Elder, 1560)

Namely, in the Decameron (Giovanni Boccacio), young storytellers run away from the plague and gather in gardens in the countryside, where they converse, keep silent, and reflect. Those gardens are not only a space of escape from the city, but also a space of soul regeneration, artistic solitude, and metaphorical freedom. Gardens and nature are the setting for the time spent in solitude together. In one of the opening scenes of the Decameron, Pampinea (queen of the first day of storytelling in the Decameron) suggests an escape from the city:

> *'Here we can listen to the birds singing, enjoy the endless shade, look at the vineyards and meadows; here life can be more blissful than anywhere else.'(Giovanni Boccaccio, Decameron, Introductory Story, 1353)*

Through storytelling, they taught, exchanged, conceived, and created, thus making leisure time productive. This way of spending free time enabled the separation from everyday horror, isolation in which we are free, in which community exists through stories and the spoken word. Young men and women, gathered in a villa outside Florence, while the plague ravages the city, tell stories to pass the time(Boccaccio, 1353).

FIGURE 2. A narrative depiction related to the Decameron (Sandro Botticelli, The Story of Nastagio degli Onesti, Part III, 1483)

Courtyards and parks are spaces where rest and enjoyment take place in nature, but under the rules of communal life. If there is repression, it is repression in the name of community or religion. In this epoch, decadence and corporeality are not separate from everyday life, but are part of the same all-inclusive economy of life.

In this first "scene" of the Decameron, leisure is still natural and all-encompassing: without defined boundaries, without spectacle, without alienation. It is an extension of life itself, where rest and work, body and nature, community and individuality - are one whole.

Here, leisure does not belong to the individual but to the community and the rhythm of the world: holidays, guilds, rural cycles of the year, and the change of seasons.

2.2 The Age of Enlightenment and the Industrial Revolution

During the Age of Enlightenment, the idea of individual leisure time became more important. At the moment when we as individuals begin to differentiate ourselves by occupation and when our occupations become professions, our societies became organized according to the principle of abilities, talents, and affinities, where, through the mutual profit of the individual and the system, we begin to progress according to the principle of division of labor. The idea that societies are organized according to the abilities and talents of individuals has a long tradition in social theory. Adam Smith, in *The Wealth of Nations* (1776), emphasizes that the division of labor, guided by the mutual interests of individuals and the system, enables accelerated progress and increased efficiency.

Soon, we become bound by the inevitability of this seeming determination and search for a role by which we become integrated into society. Émile Durkheim, in *The Division of Labour in Society* (1893), goes further, showing that the differentiation of occupations and professions becomes the basis or a new form of social solidarity and cohesion, but this means that the individual's identitybecomes tied to the function he performs in society. Karl Marx, in *The German Ideology* (1846),notes that this same division of labor narrows and defines the individual exclusively through occupation, creating both progress and alienation. Work becomes a means, not an end in itself, and man is defined and limited by his economic function.

This apparent choice leads us to think about renunciation, time, and our desires, where "hidden in its straightforwardness" lies a concept, which is also a state of mind: "leisure".

Only when we think and experience leisure time in contrast to working time, we can understand that leisure represents the time that follows where we are freed or dismissed from work, and thus it acquires a certain negative connotation in the Serbian language, where colloquially leisure could be

mistaken for procrastination or idleness. In this intertwining of meaning and use, one must not make the mistake of thinking that this neglects the possibility that daybreak, again in a positive context, is a time for rest, relaxation, and regeneration. Apart from the division between working time and rest time, the relocation of both notions from the household to the public space is another significant structural change that reflects current social relations. In this modification of the concept of leisure, it arises from the modern structure, in which leisure is strictly divided between working and non-working time, giving it the status of a special, institutionalized sphere.

In *Of Time, Work, and Leisure* (1962), Sebastian de Grazia makes a distinction between free time and leisure. Free time is available to the general population, whereas leisure involves a creative and reflective component available only to some. Leisure is a state of mind, not just freedom from work, and not everyone can have it. Thorstein Veblen, in *The Theory of the Leisure Class* (1899), introduced the term conspicuous leisure, which represents a way of demonstrating social status. Here, leisure is a symbol of prestige and social capital serving as a means of visibly emphasizing social class.

Contemporary sociologists emphasize the complexity of the concept of leisure, in which a hierarchy emerges, from passive enjoyment (in front of the television) to creative and participatory free time. The qualitative difference between freedom from work, opposed to thinking and time spent in creation, remains crucial.

At the turn of the 19th and 20th centuries, the concept of leisure entered a new phase. In contrast to the interweaving of the rhythm of community and nature in the pre-modern age, by the end of the 19th century, free time became normed, even institutionalized. This transformation is directly depicted in Thomas Mann's *The Magic Mountain* (1924). In this novel, the sanatorium is not only a place of treatment, but a space in which free time is abolished, disordered, and spontaneous, and is transformed into a disciplined, controlled form of life within the institution. This creates a transition from the free narrative form beforehand to the institutionalized, organized leisure. The Medieval and Renaissance, natural and all-inclusive leisure as depicted in the Decameron, in which the community creates meaning through traditions, play, and time spent together in nature, is now transformed by Mann into a consequence of the medical and technological rationalization of the body. Thus, the sanatorium here becomes a model of an early modern institution in which time is regulated, a daily rhythm is prescribed, and the individual is actually separated from the community, with leisure becoming a therapy or regimen.

In this sense, Hans Castorp is revealed a new form of existence: leisure as a discipline.

> *'Life here was not just for rest; it was the very essence of existence, an extended time that seemed to float beyond the ordinary rules of the world.'*
>
> *(Thomas Mann, The Magic Mountain, 1924)*

This quote hints at the subjective experience of time, where leisure is not just a break but becomes an independent system. In institutions such as spas, sanatoriums, and to some extent hotels, free time is professionalized by organizing it both spatially and temporally.

> *'Time here expands and loses its sharpness… time floats here, slowed down and condensed.'(Mann, 1924)*

Precisely because it is no longer tied to the change of season and nature, but to the rhythm of the institution, modern leisure acquires the character of floating and diluted time. In the sanatorium, the subject cannot work he must not return to productivity, which is the privilege of ordinary life.

In this way, leisure ceases to be a place of freedom and is disciplined by hygiene and collectivism. It becomes subordinate to schedule, diagnosis (medical), institutional logic, and hygiene norms. This marks the beginning of what Michel Foucault later theorises as the biopolitical organisation of time and the body (*Naissance de la clinique*, 1963). Also, leisure is no longer produced through community, but becomes a space of individual therapy through which the subject is socially regulated. The sanatorium thus anticipates modern programs of spas, tourist wellness centers, health preventive and recreational industries, which arose from this concept of leisure.

A subject who no longer belongs to a family, a guild, or a village community, who has no insight into the entire cycle of production, and who submits to the new regime of time is actually a new subject - a subject of modernity. At "height", as Mann writes, time is no longer linear but psychological, spilling and authoritatively structured by the institution.

Ruben Östlund describes this moment in the film "Triangle of Sadness" (2021). The decadence of the upper classes turns into the grotesque and then into decay. Aesthetic treatments and procedures, luxury yachts, endless menus - symbols of wealth and exclusivity turn into a sight of disgust. Privilege turns into absurdity.

(the captain of the ship — a drunken Marxist, and a Russian billionaire capitalist are sitting at the table)
(laughter)
(the Russian brings a bottle to the table)
Captain: *(reaching for the bottle): "Thank you."*
Russian: *"I have a joke, huh... Do you know how to recognize a communist? — That's someone who reads Marx and Lenin. And do you know how to recognize an anti-communist? — That's someone who understands Marx and Lenin!"*
Russian: *"That's what Ronald Reagan said. Witty guy."*
Captain: *"Never argue with an idiot... he'll only bring you down to his level—and win with experience. Mark Twain."*
Russian: *"Yeah, okay... Ronald Reagan also said, 'Socialism only works in heaven, where they don't need it — and in hell, where they already have it!'"*
(mutual laughter)
Captain: *"That's a good trick, yeah. Okay, wait... I've got one too."*
Captain: *"Here! 'Growth for growth's sake is the ideology of the cancer cell.'—That's what Edward Abbey said."*
Russian: *"Listen... the problem with socialism is that eventually you run out of other people's money. Margaret Thatcher."*
Captain: *"Ah... you'll like this. 'The last capitalist we hang — will be the one who sold us the rope.' Karl Marx."*
Russian: *"Whoa, okay, okay...he-he..."*
(the bottle falls off the table; they laugh)
Captain: *"Dear God..."*
Russian: *"Okay, now the classic. 'The most powerful force in the world today is man's eternal desire to be free and independent.' Kennedy."*
Captain: *"Good... freedom in a capitalist society always remains the same as in ancient Greece—freedom for slave owners."*
Russian: *"I know. Vladimir Lenin! Ha! School..."*
Captain: *"Ah, you see..."*
Russian *(raising his glass) : "A Russian capitalist — and an American communist!"*
Captain: *"On a luxury yacht... of $250 million."*

(Ruben Östund, 2021)

Leisure in the current timeframe is becoming an ideological scene. In this film, the conversation between the ship's captain, a declared Marxist, and the passenger of the ship, a Russian capitalist, becomes a prophecy of modern free time: what was created to be a space of rest and enjoyment turns into a parody, a self-destructive ritual that reveals the greed of each class. The space of the luxury yacht functions as an isolated capsule in which representatives of social positions meet, revealing, through ironic, almost cabaret language, that ideological differences are part of a ritual of leisure rather than a real social conflict. Leisure is not a place of rest, but a training ground for a superficial entertainment spectacle. The manufactured superficiality that has become the structure of our free time does not set us free; it conditions us into a system in which all strata of society, from the elite to the working class, participate in the same game of greed, envy, and self-loathing, in a common helplessness.

The yacht sinks under the weight of its own false image, like a closed capsule that promises enjoyment but produces only envy, dissatisfaction with every layer, and the collapse of personal life. At this moment, leisure becomes a satire that warns us that we have crossed the line where rest ceases to exist as we know it and becomes a mirror of our own superficiality and lack of self-awareness. Leisure no longer produces release, but reproduces invisible social tensions, principles of modernism, meeting all the criteria of the hotel typology at the time, and was later promoted as a hotel with "thirty completely hygienic, airy and sunny rooms". In the European context at that time, the relationship between health and rest was redefined within the functionality of tourism, so that rest was no longer seen as a private luxury but as a societal resource. The geometry of modernism, reduced to a rational grid in which every room is equal in quality, sunlit, and ventilated, dictates the spatial organization, which, shaped by emerging social ideals, generates new forms and "rules" of leisure. The rational grid is not only a spatial strategy, but it also represents an abstract signifier of program regulation, so that spatial equality removes the hierarchies of visitors, imposes the same rhythm of the day for everyone, the same routines of hygiene and services, so that the position and size of the room is no longer able to represent the difference in social status.

This object becomes a manifesto of a new epoch when hygiene, sunlight, and the airiness of the room become "medicinal means" of modern society. Hotel 'Žica' introduces new standards of comfort and hygiene, but also a new logic of leisure: disciplined, rational, shaped by architecture. Thus, it fits into the medical paradigms of the time (sanatoriums) that combine disease prevention and architectural complexes, so that architecture is understood as a new therapeutic instrument.

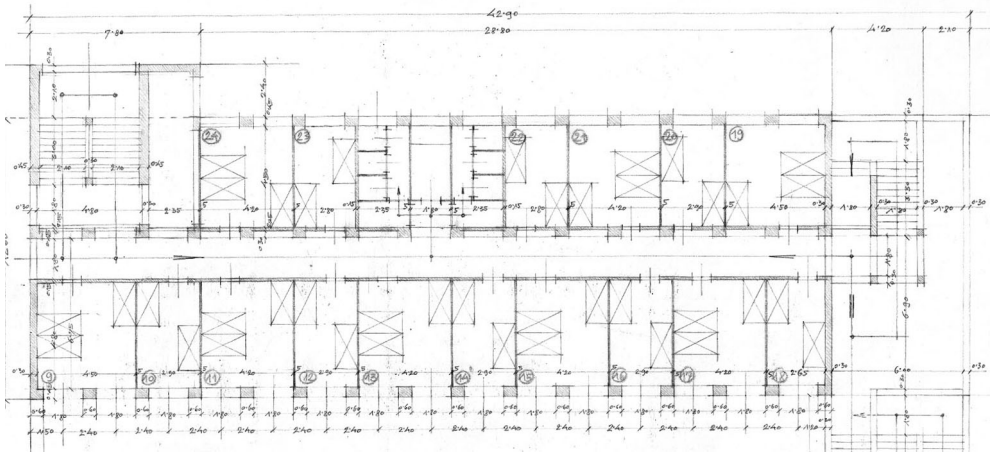


FIGURE 4: Archive floorplan drawing (Fondation Milan Zlokovic)

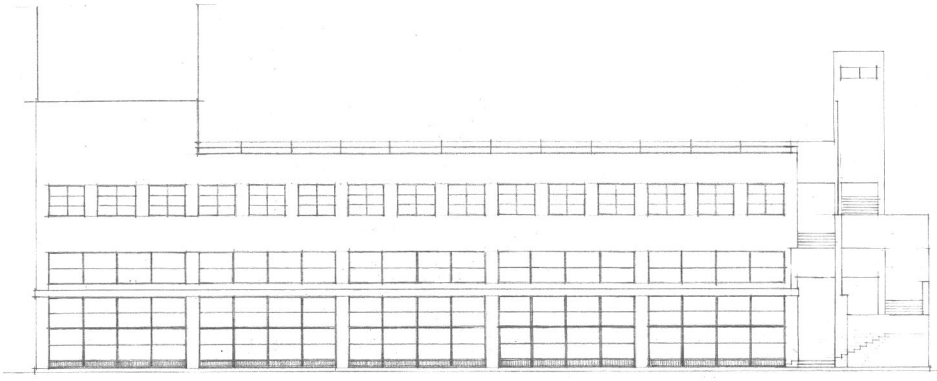


FIGURE 5: Archive drawing (Fondation Milan Zlokovic)

Zloković additionally integrated the spaces of common life: the dining hall in front of the hotel was a place of collective gathering. On the roof terrace, there was an open-air cinema, which ties in the idea of hygiene to the cultural program and shared entertainment. At the same time, during the day, the roof terrace is free for sunbathing. Resting here does not take place spontaneously, but is programmed and architecturally controlled. The combination of hygienic, almost medical practices such as sunbathing and being in the open with a cultural program, a cinema or communal dining, shows how leisure is understood not only as a physiological dimension of the body in the absence of effort, but as a cultural obligation, as a reshaping, this time of a modern subject, through communal rituals, like those of the Renaissance.

Since Corbusier's concept of the Radiant City, sun, air, hygiene, and health became the central values of the architectural paradigm. Sunny rooms, transparency, ventilation, and contact with nature are not only technical features, but part of the ideological project of a healthy society. Hygiene is associated with morality, discipline, progress, where modernist hotel architecture becomes an instrument of a new social ideal and a manifesto of a new order - socialism.

The internal equality of the organization is also reflected externally in the facade with a repeating rhythm of openings, without hierarchy and decoration, where each unit receives equal treatment. The absence of decoration in the architectural language of modernism is also connected with the aspiration to rationalize everyday life, to emphasize functionality as an ideal, through which aesthetics radically diverge from decadence and immoderation, becoming subordinated to the ideas of health, order, and efficiency.

Leisure in this context is both therapy and an indication of the upcoming social order. Hotel architecture is not a neutral framework, but a manifestation of new ideals - hygiene, rationality, and social equality. Social behavior is also disciplined through the spatial framework constructed in this way. Contact is encouraged, but withcontrol over the individual's body and time, in order to participate in social interaction, he must show orderliness and punctuality in respecting the new time-division patterns.

In this period, this principle is democratized. The right to go on vacation becomes a test of social justice, where everyone has the opportunity to do so. But behind that promise is hidden a new rigidity. The body is organized through collective rituals, a strict schedule, and the imposed discipline of rest. Hygiene and politics merge into one, and free time turns into a collective choreography of health and social gathering.

FIGURE 6: Archive photo of the dining hall (Fondation Milan Zlokovic)

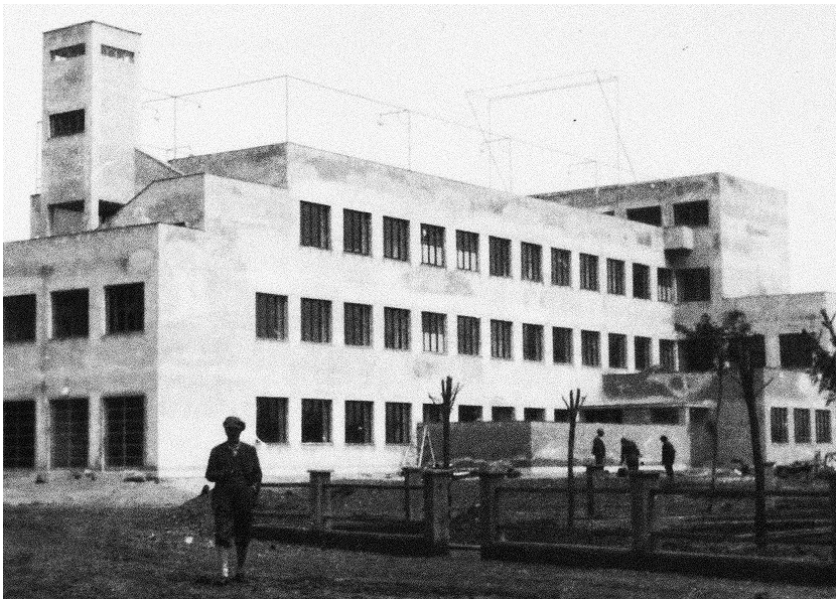


FIGURE 7: Archive photo of the roof terrace (Fondation Milan Zlokovic)

The spontaneity of nature and the narrative of the Decameron passes into the framework of hygiene, order, repetition, and the collective ritual of the body. Free time is no longer a complete flow of life, but a separate institution in which architecture and politics unify the rhythm of the body and the community.

2.3 Functional organization and social significance

Architecture here becomes a social matrix - equal rights to rest and health become visible in the very form of the building. The bare form of "Zič̆a" speaks of a new message of leisure; it is no longer an individual luxury, but a collective standard. The hotel was therefore also a social experiment: the rationality of the organization reflected the then-ideal of rest accessible to all, where comfort was defined by the rules of hygiene, equality, and discipline. The "thirty completely hygienic, airy and sunny rooms" are not only accommodation facilities, but an architectural program of health and hygiene. The number of rooms and their typological uniformity reflect the modernist idea of universal needs and a standardized user, as a concept that will later be widely applied to workers' resorts in socialist Yugoslavia, where the idea of equality is also standardized through the spatial framework.

2.4 Hygiene as an architectural program

Later, in socialist Yugoslavia, this model spread through workers' cooperatives, where the right to rest became part of the social contract. Workers received organized arrangements - clearly defined places and modes of vacation - as an extension of the same logic, where, in the interwar period, this was just a privilege of the bourgeois class. The idea that vacation leave is as programmed as work started in hotels like "Žič̆a" and became a pattern of collective everyday life in socialism.

The park in front of the hotel was an extension of the hotel's internal functions, a place to walk and engage with nature. The Ibar River, towards which the hotel is oriented, adds a layer to this architectural logic: from the room, through the facade, to the park, and further to the water, the program, in this sense, develops beyond the designed. The use of landscape as part of the therapeutic experience here has its roots in the sanatorium tradition, but is adapted to a recreational form, not purely medical but combining health and leisure. This is one of the most important innovations of the hotel, which distinguishes it from the "boarding house" structures of the previous era.

FIGURE 9: Archive photo of Mataruška Banja and Hotel Žica (Fondation Milan Zlokovic)

This is how the spatial continuum of leisure was formed - from the individual space of the room, through the collective spaces of dining and cinema, to the landscape of the park and the river. This continuity reveals how leisure was understood in the interwar period: as a standardized but common value, shaped by proportion, grids, and the extension of architecture into nature. "Žiča" thus became the architectural scenery of a way of life, which gave form and meaning to vacations in accordance with the ideals of the era.

3. LEISURE IN THE CONTEMPORARY INFORMATION SOCIETY: THROUGH THE INTERPRETIVE MODEL OF VISUAL COLLAGE

3.1 Contemporary frameworks of leisure

Leisure also implies an existential layer, which Milan Kundera skilfully reveals in The *Unbearable Lightness of Being* (1984). Here, this notion oscillates between two poles: hedonistic relief and a deep sense of emptiness, as the whole world of clear structures begins to disappear and social roles become increasingly unclear. Thus, the key point of criticism of the decadent Decameronian past time as leisure is actually contained in this phenomenological view of the experience of freedom in the conditions of repetition as proposed by Kundera: where freedom from work leads two ways - either to "heaviness", that is, to a state in which every action is too difficult or to "lightness" where every act becomes insignificant.

In this context of leisure, an excess of free time ("endless rest") can produce a paradox in which freedom becomes meaningless, and leisure loses its regenerative and thought-provoking qualities. In any case, through this layer, we can understand leisure as an indicator of how the subject experiences time, space, and himself.

The transition from an industrial to a post-industrial society brings various socio-technological transformations, where contemporary digital regimes erase the binary perception of time (one occupied by work and the other free of it) established by industrial modernity. In the post-industrial, information age, the question of leisure is no longer simply a matter of "free time" versus work. The transitions shown from the pre-industrial to the modernist model illustrate how leisure changes its ontological status: from a space of thought and social community, through institutionalized therapy, finally to a contemporary position of fragmentation, commodification, and technological modulation (Bell, 1973; Castells, 2010). A multidimensional reading of leisure today is needed to form the instruments for its architectural reflection.

In relation to the socio-economic aspect, Daniel Bell (1973) names the transition to a society of services, knowledge, and information as a Post-Industrial Society, in which the economic foundation of time is changing as work becomes structured differently. The production of value is less related to the physical work itself, so free time becomes not only the excess time after work, but an entire field in which new economic and cultural values are produced. The individual asserts himself through patterns of consumption, self-development, and experience, so new vacation architecture, such as wellness centres, spas, branched hotel typologies, and digital havens are being developed. These spaces organize a new subjectivity and a new subject in the information age.

Digitization introduces flexible, distributed work models such as freelance platforms, partial arrangements and the "gig" economy. Thus, the stable form of working time established in industrial society is undermined, and work becomes fragmented, situationally structured, and permanently available. Leisure thus ceases to be defined as clearly allocated time after work, but is recognized as some micro-interval or interstitial moment "between notifications." Deleuze (1992) describes this condition as the logic of the "society of control", where subjects are not confined to institutions such as factories, schools, or hospitals, but inhabit networks that are managed continuously and diffusely. This change is even better understood in contrast to Foucault's (1975) modernity as an epoch of discipline, where both time and the body are organized through typologies of institutions; thus, leisure is part of the biopolitical regime, which

is controlled, time-limited, and institutionally mediated. Deleuze (1992) sees the very transition from this modern to post-industrial society through modes of management. The subject is tracked through digital traces and algorithmic management. By monitoring habits and patterns of behaviour, surveillance also constitutes leisure, which is no longer just time outside institutions but is now constantly monitored and measured.

> *„In the disciplinary societies one was always starting again (from school to the barracks, from the barracks to the factory), while in the societies of control one is never finished with anything - the corporation, the educational system, the armed services being metastable states coexisting in one and the same modulation, like a universal system of deformation."*
>
> *(Gilles Deleuze, Postscript on the Societies of Control, 1992.)*

Unlike the disciplined leisure in a modernist hotel ('Žiča'), the contemporary platform of leisure implies inclusion in a network that controls leisure, making it both constantly available and manipulated.

On the other hand, modern society emphasizes the "experience economy" (Pine & Gilmore,1999), where experience and free time are commodities, and tourism and the wellness industry produce new, commercialized forms of leisure that are an integral part of capitalist rationality. Leisure here imposes a requirement on the subject to use his free time to improve himself, to be somehow "productive" in his leisure time.

Within post-work theories (Srnicek & Williams, 2015), the future is predicted to be automated, so there is no need for paid work. In this vision of the future, leisure is no longer just a break from work but becomes a key element of existence.

Taken together, these perspectives paint a picture of the contemporary interpretation of leisure as a concept that is fluid, fragmented, and culturally mediated. Thus, we see leisure in the architectural framework, not as a state of passive idleness, but as a dynamic set of practices, techniques, and ways to shape the subject.

> *To present the complex nature of leisure and to continue using it as a basis for the architectural design of future spatial frames of leisure, this paper establishes an interpretative tool that creates visual and conceptual connections between the historical layers of the concept's meaning and its architectural manifestations.*

3.2. Visual collage as an interpretative tool

To lay the groundwork for the final stage of this work, in which the framework or the future of leisure is constructed, a visual collage was used as a tool of interpretative synthesis that operates on two levels. The first is epistemological, where it is possible to visually articulate theoretical insights into the nature of leisure. The collage combines fragments from historical narratives, cultural representations, and literary texts, producing a new configuration of meaning. Such an interpretive tool becomes a technique for mapping the complexity of reality and relies on postmodern collage practices. The second level at which this tool operates is the design (architectural) level, enabling theoretical categories to be translated into spatial relations, program mechanisms, and ambient structures. The fragmentation of work and free time is visualized through the technique of image fragmentation, with forms of digital control (overlapping layers) and the aestheticization of experience.

Thus, the collage functions as a "diagram apparatus", not as an illustration of theory, but as a field in which it produces new paths of reflection and creation. By connecting the theoretical analysis of the contemporary context with the interpretive tool of visual collage, it is possible to articulate an architectural platform for understanding and redefining leisure.

By constructing visual collages of transformations that the concept of leisure undergoes through different eras, now lies a basis for conceiving the next, projected future of the transformation of leisure. Overlapping, multiplying, isolating the subject - even interpreting the body in this context and juxtaposing different references with images of the spa settlement of Mataruška Banja itself, and making allegories of what images of leisure time can be, a visual review is created in all the ways leisure has manifested itself through different time periods.

By looking for further references across different historical periods, it is possible to profile and map the characteristics of those periods, the relationship between work and leisure, and the social mechanisms that shape them. The historical timeline of leisure, along with citations and references from literature, film, and art history, formed the next four described sequences of these transformations. Furthermore, these sequences are assigned to the spatial attributes recognized in the aforementioned references. After naming these attributes and their chronological setting in the evolution of the concept of leisure, the modifications of the notion become clear.

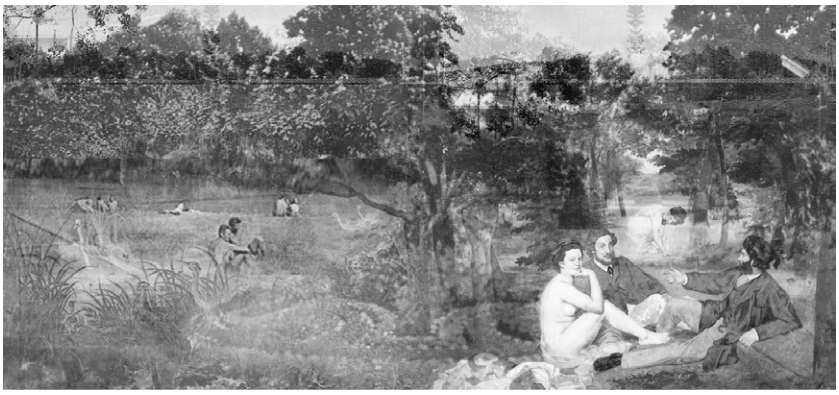


FIGURE 9: Collage_sequence 1 (Author's collage)

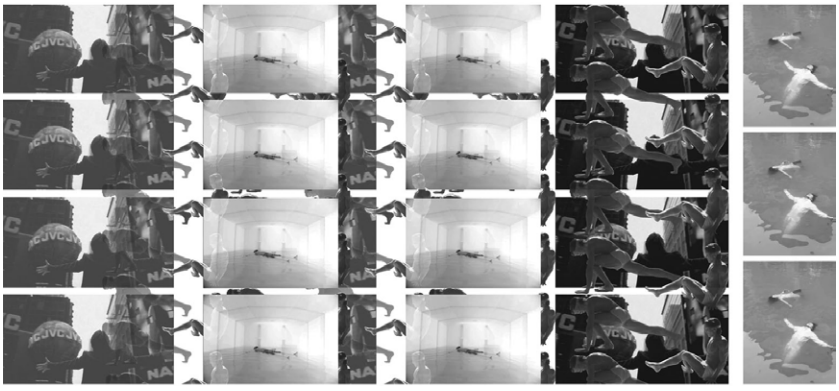
sequence 1 _ Spontaneity and asymmetry

In this sequence, in front of Hotel "Žiča", architecture appears as a series of scattered, pavilion volumes. They are open, porous, and asymmetrical, dispersed as gathering points. This fragmentary structure evokes the natural flow of life in which work and rest take place as they take turns in the rhythm of the community. Here, gardens and open spaces enable a fluid transition from landscape to architecture, creating an atmosphere of shared living and storytelling.

sequence 2 _ Rationality and rhythm

The second sequence is further gradually organized into a clearer rhythm. The pavilions grow into a continuous grid whose proportions are taken from the logic of the facade of Hotel "Žiča". Modularity and repetition of openings define the architecture as a clear and uniform frame, where all spaces have an equal quality. Here, leisure takes the form of a common standard: disciplined and uniform. This geometry also has the potential of a spa - thermae function, as a collective space of hygiene and recovery. Rhythm and module are translated into a series of shared spaces, which architectural logic connects with the tradition of spa settlements. In this way, this act remains not only in an architectural form, but as a potential in relation to the specific context of Mataruška Banja and its resources.

FIGURE 10: Collage_sequence 2 (Author's collage)



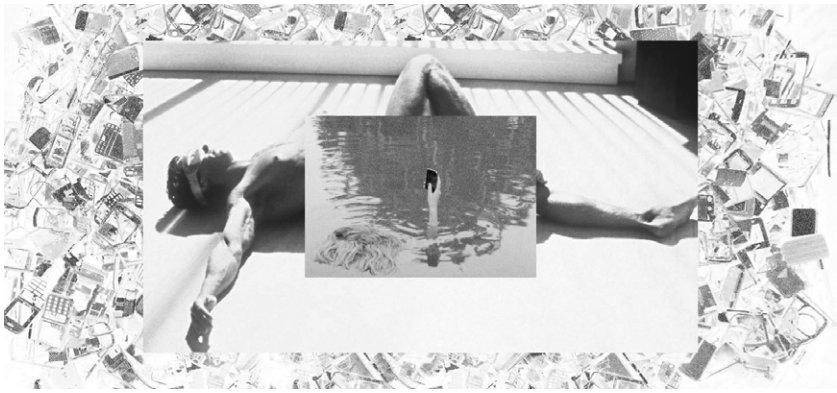


FIGURE 11: Collage_sequence 3 (Author's collage)

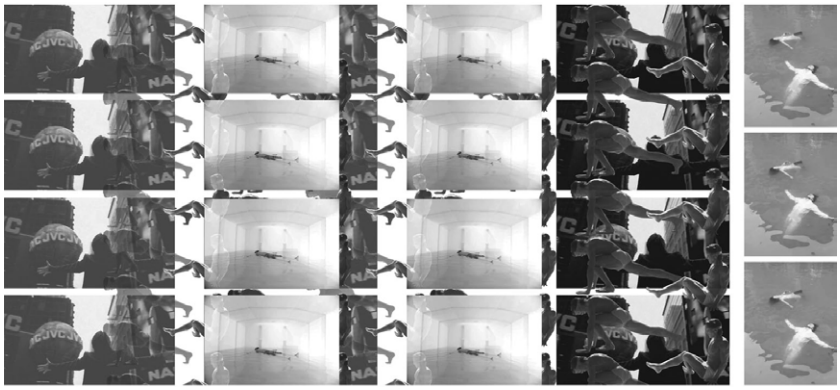
sequence 3 _ A space within a space - encapsulation

The third sequence forms a structure that creates a space within a space. A transparent envelope encompasses the volumes of the previous acts, bringing them together into a single larger entity. What was previously dispersed and free is now located within a common framework. Encapsulation becomes an architectural gesture of contradiction: the freedom of internal forms persists, but is subordinated to the boundary of the outer membrane. The views extend towards the landscape, but always through the glass barrier. This sequence is a moment of both addition and closure - an architecture that creates a unique internal unity, while at the same time showing the ambivalence between openness and hermeticity, between transparency and control.

sequence 4 _Artificial landscape

At the threshold of the river, a shaped landscape develops - an artificial garden that extends architecture into the natural environment. This space brings a new scenery of leisure: landscaped grounds, contours that follow the course of the river, places to spend time on the water, in the likeness of today's structures, where entire complexes mold the natural terrain and transform its landscape. Nature and artificiality are not excluded here, but merge into a whole, creating a landscape which is both natural and engineered.

FIGURE 12: Collage_sequence 4 (Author's collage)



4. RESEARCH THROUGH THE PROJECT: A VISION OF THE FUTURE OF LEISURE

In modern society, the opposition between work and free time becomes even more complicated by the parallel fragmentation of our private and business lives into the real and the virtual, which further blurs these four boundaries.

Work defines us within the framework of society - it gives us a role in the production of capital, where free time becomes a field of manifestation of our desires and needs. As our work is, at the same time, our social role, it creates a framework that shapes society and promotes its progress. Simultaneously, there is an inextricable connection between the necessity of work and the needs of individuals outside the working hours. The role of free time is to provide space for needs and desires outside the scope of work in the free zone of rest. Today, within capitalism, society's free time is increasingly controlled, with few outcomes and little autonomy.

The modern context implies that the manifestations of our needs within free time also takes place in the virtual field, where we engage in a far more passive form of entertainment and stimulation through algorithms and screens. This state is a direct consequence of Deleuze's society of control, within the sphere of our limited and controlled free time, so it becomes questionable, within an ontological level, what truly remains as our intentions, desires and needs.

If Artificial Intelligence programs the algorithm and later synthesizes the content that we passively consume as a form of advertising or images of what we can be, want, buy or see in our free time, with an increasingly long working week with numerous promises of benefits in the form of time savings and conveniences such as "working from home" the boundaries between what is work and free time will continue to merge further, and free will and the meaningful and intentional fulfilment of leisure time will become more difficult.

Privilege and an indicator of class difference will become the right to an offline life that few can afford. Reduction, filtering, and isolation from information and autonomy in how we spend our free time becomes the ultimate luxury. The most direct class indication will become screen time. The greatest privilege becomes isolation from the network and the surveillance that takes part through it. Only "going offline" opens the possibility of overcoming the boundaries between work and rest, public and private, and sincere intention and manipulation.

5. CONCLUSION

Networking has enabled us to carry out our work at home, as we have undergone a transformation in the post-COVID world, where the boundaries between the workplace and the home are being erased. It is normalized for a large number of occupations to take place in this manner. By analogy with Google offices, where the home has been brought into the office, in the post-COVID world, the office has been brought into the home. This state of unclear boundaries contributes to the merging of work and leisure through a new model in which work never stops. In the Institute of Future Studies of Copenhagen article, 'What Will Leisure Mean to Us in the Future?' (2023), this possibility is considered. Statistics show that 27% of current occupations can already be replaced by AI technology. In a future where our jobs will most likely become automated and where technology will work for us, will our free time become our work? Today's leisure time is filled with passive rest or rest within a virtual world where we project our desires and needs, and perhaps experience them in inert comfort. By the next phase, our occupations become insignificant as automated, self-sustaining systems take over, leaving us deprived of work, and entertainment in the virtual world becomes so saturated that it ceases to be a space of leisure. In this world, our free time is our work.

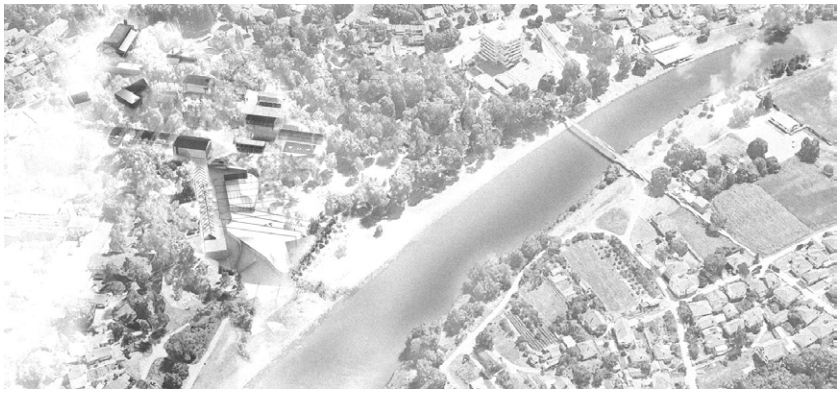


FIGURE 13: Variant of a spatial configuration (Author's illustration)

The notion of work becomes abolished in a future where everything is automated. Free time might become a field of research of our needs, spared from the influence of algorithms. Leisure, hypothetically, might become a space in our private lives, reflecting the consequences of everything our working time and the division of life into work and non-work offer or take away from us. In this hypothetical scenario, this project takes place in a context where it is possible to re-examine these spatial relations of leisure for future potential.

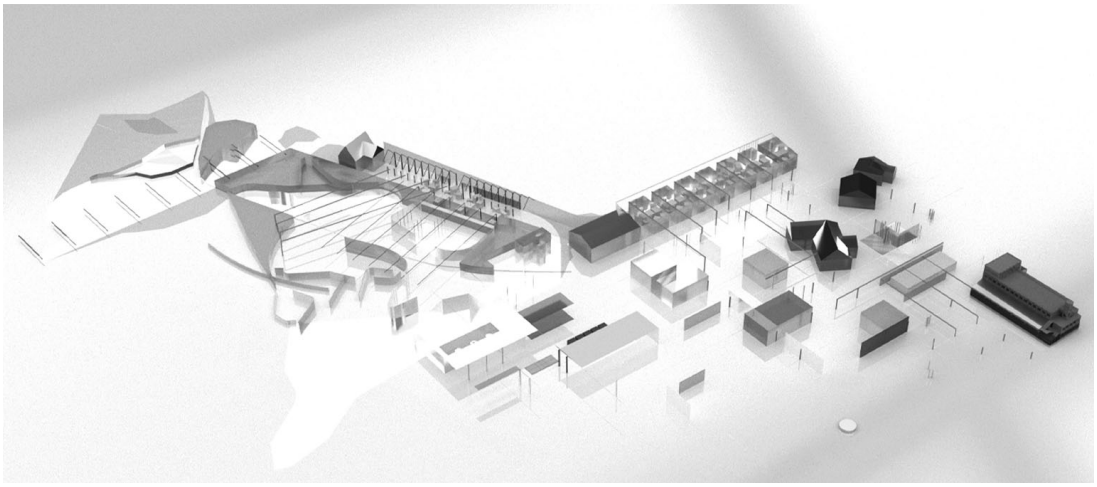


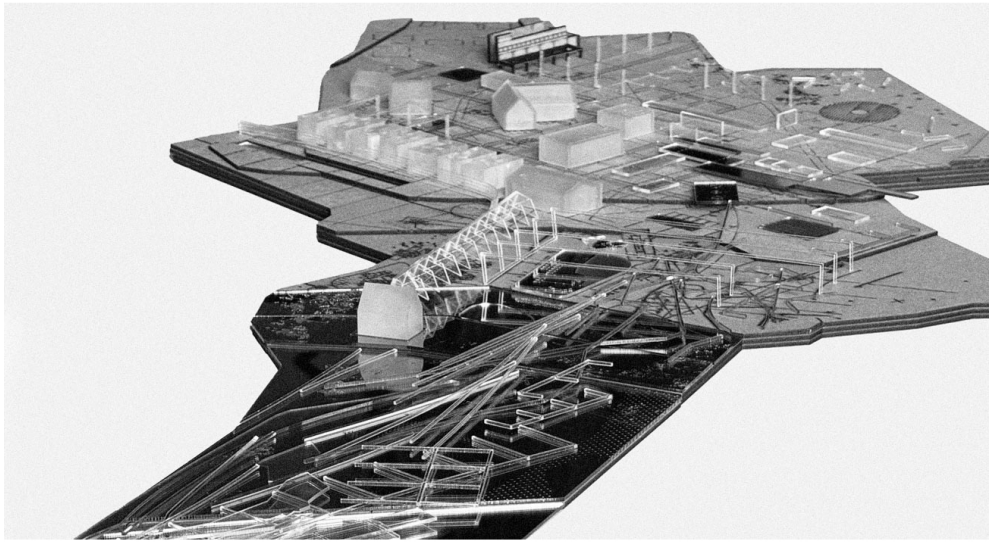
FIGURE 14: Variant of a spatial configuration (Author's illustration)

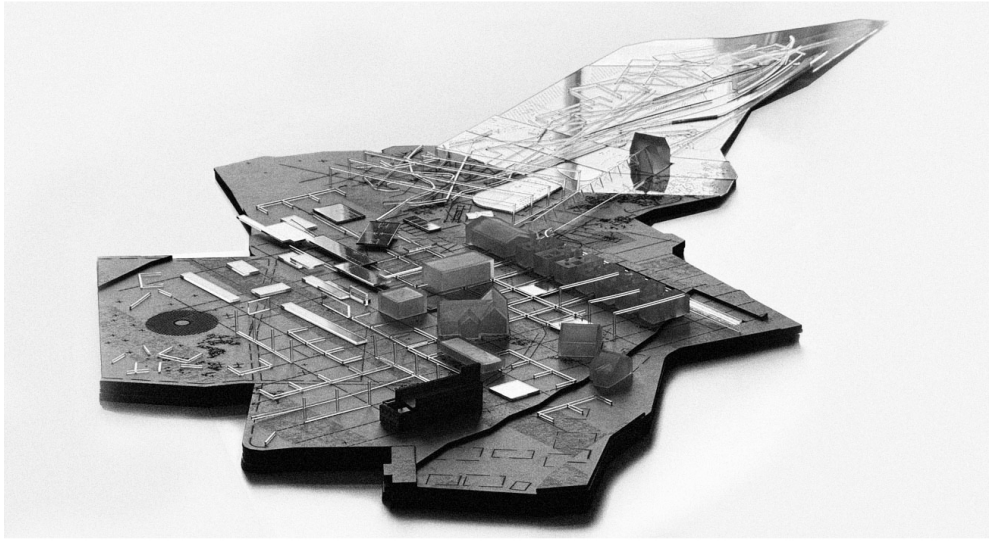
FIGURE 15: Site plan drawing overlapped with collage (Author's drawing)

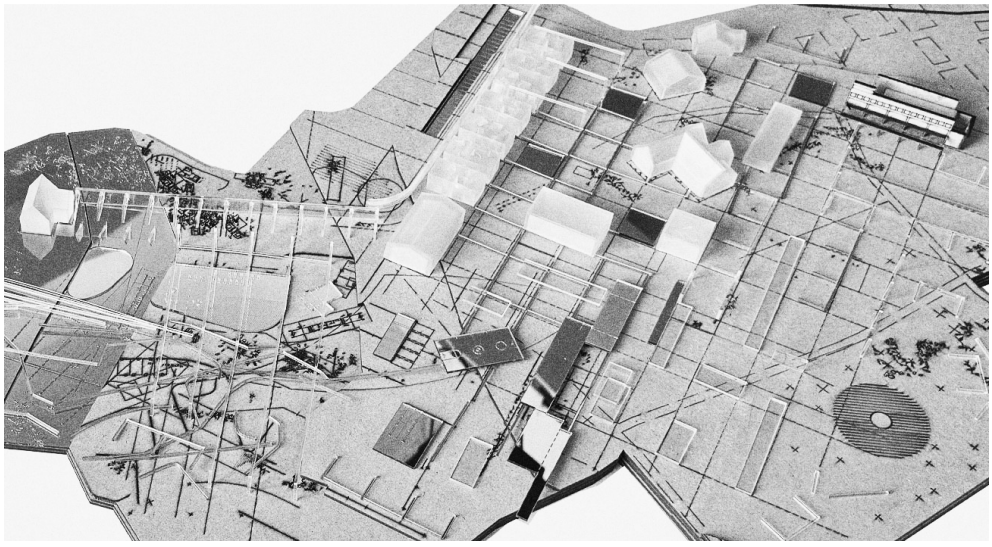
Through the defined framework of spatial attributes assigned to each sequence, these architectural relations are applied to the context of Mataruška Banja, specifically within the park that unfolds between Hotel Žiča and the river. Considering the delicate matrix of the intervention zone, and guided by an approach aimed at recuperation while understanding the nuances of the spa settlement, these attributes are distributed throughout the area as a series of control points and subtle suggestions for possible spatial combinations. Layering as a tool, similar to its use in the initial method of visual collage as an interpretative instrument, opens the possibility of multiple spatial configurations and perceptions of the drawing.

The recognised "sequences" become synthesized into a complex system of values within the different manifestations of the notion of leisure, creating a field of intervention within the area of the spa settlement of Mataruška Banja, proposing a system of spatial variations of this notion and opening possibilities of its articulation for future users of such spaces.

FIGURE 16: Architectural model (model by the author). Photo by Dejan Todorovic.







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CONSIDERING PROTECTED AREAS AS THERAPEUTIC LANDSCAPES: THE ROLE OF CULTURAL AND NATURAL HERITAGE IN COMPREHENSIVE SENSORY WELL-BEING

ABSTRACT

Spa complexes are primarily interpreted through the curative properties of mineral waters and the immediate medical complex, often overlooking the richness of the wider landscape. This paper reinterprets the Slankamen Spa (Stari Slankamen, Serbia) as a therapeutic landscape that jointly supports sensory and emotional well-being through cultural heritage, protected natural areas, and historically embedded spatial structures. The study adopts a qualitative, interpretative spatial approach grounded in the concepts of therapeutic landscapes and landscape memory. Methodologically, it combines a focused review of selected literature that motivated the research, observational abstraction of persistent spatial elements from an early-eighteenth-century historical map in correlation with contemporary orthophotographic imagery, and finally, spatial overlay mapping of cultural heritage assets and natural protection regimes. Rather than performing a strict cartographic comparison, the analysis identifies enduring spatial axes, corridors, and morphological relationships through which historical memory remains embedded in the present-day landscape. The results delineate three analytical areas characterised by different degrees of cultural–natural interweaving. By operationalising landscape memory through interpretative mapping, the paper contributes a transferable conceptual and methodological framework for rethinking spa environments as open, heritage-based therapeutic landscapes.

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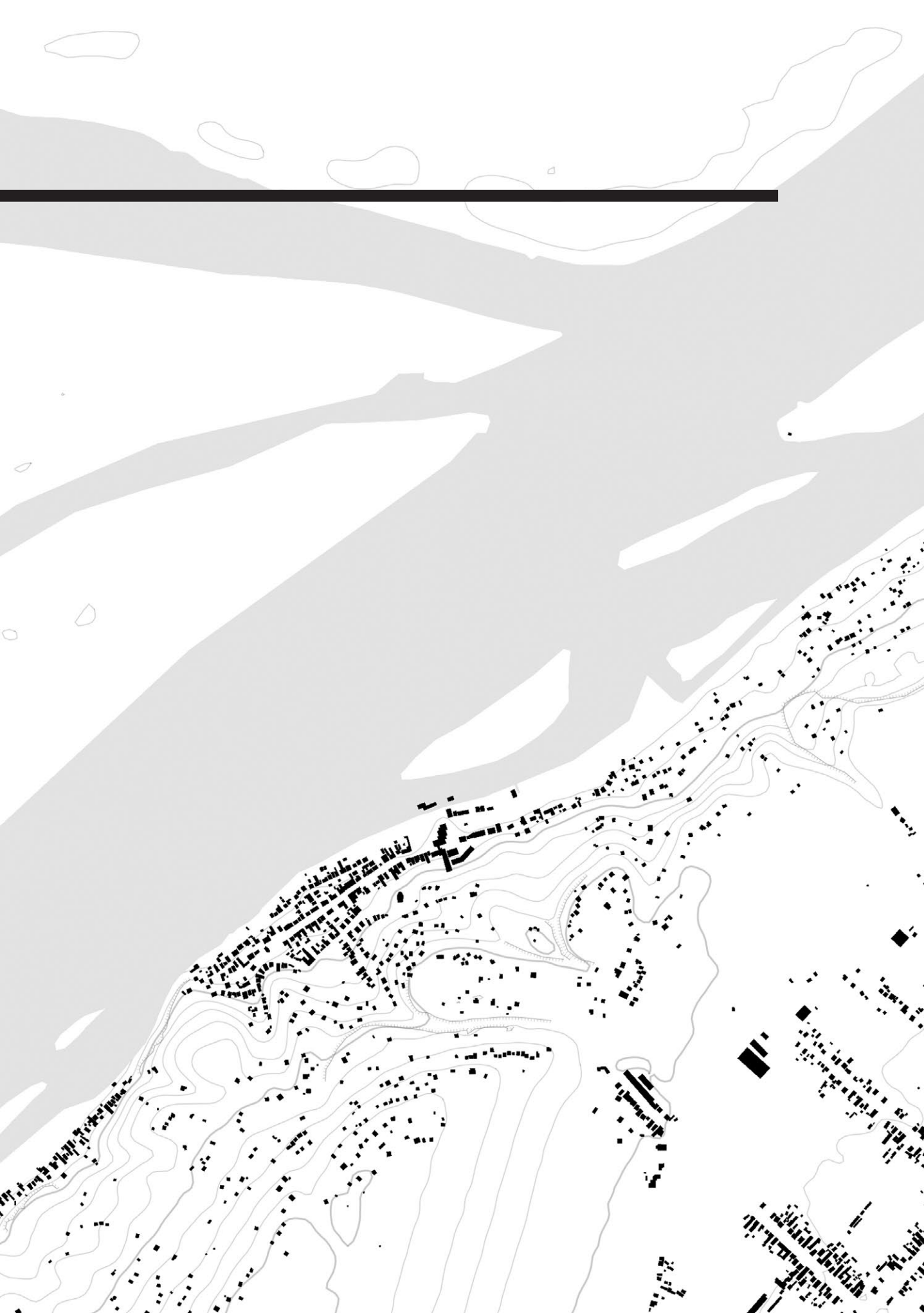
KEY WORDS
SPA LANDSCAPES
STARI SLANKAMEN
WELL-BEING
CULTURAL HERITAGE
NATURAL HERITAGE



1. INTRODUCTION

A sojourn at a spa complex represents one of the most apparent examples of consuming the benefits of land, as their therapeutic effects are inseparable from the specific spatial, environmental, and cultural contexts in which they are embedded. Unlike therapeutic treatments that can be relocated or performed independently of place, spa therapies operate only through a direct engagement with their surroundings. Traditionally, however, the spa has been perceived primarily as a clinical institution, with analytical focus placed on the healing properties of mineral waters and the systematic arrangement of medical facilities and their adjacent parks. Such a reductionist perspective tends to marginalise the wider landscape, despite its potential role in shaping holistic recovery and sensory well-being.

Over the past three decades, the concept of therapeutic landscapes has broadened the understanding of healing environments beyond the confines of clinical facilities. Some of the earliest mentions of therapeutic landscapes can be found in the work of Gesler (1992), who emphasises health effects as an outcome of the interaction between environmental and sociological factors, introducing notions such as “sense of place, landscapes of meaning, authentic and inauthentic landscapes, landscapes of the mind, and landscapes as texts (texts of negotiated reality), territoriality, and legitimization, among others – used within cultural geography to interpret the spaces inhabited by people. Experiential attachment in health-related spatial research. Building on this foundation, Williams (1998) emphasised the importance of emotional and experiential dimensions in therapeutic environments, arguing that healing processes are inseparable from human engagement with space. Within this theoretical framework, spa landscapes can be understood not merely as sites of medical intervention but as complex environments in which natural features, built structures, cultural memory, and everyday practices collectively contribute to well-being.

In the context of Serbia, as an example of a post-socialist society, spa complexes constitute a particularly revealing spatial typology. Historically, they have functioned as hybrid environments, simultaneously combining medical institutions, natural assets and social resorts, emerging across diverse periods, from Roman and Ottoman bath traditions to nineteenth-century royal spas and twentieth-century workers' resorts. What unites these phases is the continuous reliance on natural resources combined with culturally specific forms of social use. However, the post-socialist transition has profoundly altered this model. As former socially managed spa centres were subjected to privatisation and fragmented ownership structures, their spatial coherence was frequently disrupted, resulting in reduced accessibility, functional isolation, and the gradual erosion of collective memory associated with these places (Ljubisavljević & Radosavljević, 2018; Vujošević et al., 2012). In many cases, the spa has been reduced to an enclosed clinical complex, detached from the surrounding cultural and natural landscapes that historically constituted its therapeutic foundation.

This fragmentation is particularly problematic when considered through the lens of contemporary understandings of wellness. By definition, it encompasses the integrated well-being of body, mind, and spirit, extending beyond purely physiological treatment to include sensory, emotional, and experiential dimensions (Denda & Micić, 2016). From this perspective, the therapeutic value of spa environments cannot be evaluated solely based on medical infrastructure or mineral waters. Rather, it must also account for the symbolic, morphological, and sensory qualities of the surrounding landscape, including cultural heritage, historical narratives, and protected natural features. Despite this, cultural and natural heritage are often treated as separate domains within planning and protection frameworks, managed by distinct institutional systems and rarely addressed as an integrated resource for health and well-being.

Against this background, the present study addresses a critical research gap at the intersection of architecture, landscape studies, and heritage research. While existing scholarship has acknowledged the importance of therapeutic landscapes and, more recently, the role of cultural ecosystem services in well-being, there remains a lack of spatially explicit methodologies that link cultural heritage, natural protection regimes, and landscape morphology in spa contexts – particularly within post-socialist settings. Specifically, there is limited research demonstrating how layers of cultural memory and protected natural environments can be operationalised through spatial analysis and mapping to support holistic therapeutic landscapes.

The research focuses on the spa landscape of Stari Slankamen, a site characterised by an exceptional overlap of protected natural areas and historically significant cultural assets. The central aim of the study is to examine whether and how the spatial interweaving of cultural and natural heritage in this area can form the basis for redefining the spa as an open, integrative therapeutic landscape rather than an isolated medical facility. To address this aim, the study poses the following research questions:

(1) How are historical events and cultural memory inscribed in the contemporary spatial morphology of Stari Slankamen?

(2) To what extent do cultural heritage assets and protected natural zones overlap spatially, and where are they separated?

(3) How can these spatial relationships inform the development of therapeutic landscapes that support sensory and emotional well-being?

Methodologically, the research begins with a focused literature review as a prelude to the conducted research. An early-eighteenth-century map depicting the Battle of Slankamen is used as an initial historical source. Relating this ancient source to contemporary ortho-photographic imagery, persistent spatial axes, corridors, and morphological traces of memory are identified. These findings are subsequently overlaid with current protection regimes and the distribution of immovable cultural monuments in order to delineate zones of varying cultural–natural interconnection. Through this approach, the study seeks to establish a spatial framework for identifying areas with the greatest potential for integrative therapeutic and cultural landscape interventions.

The paper is structured as follows. After the introduction, the theoretical framework outlines key concepts related to therapeutic landscapes, cultural landscapes, and cultural ecosystem services, establishing the analytical lenses used in the study. The methodology section then details the research design, data sources, and mapping procedures. This is followed by a spatial and historical contextualization of the Stari Slankamen area, which provides the empirical basis for the analysis. The subsequent sections present and discuss the results of the cartographic and spatial analyses, before concluding with recommendations for future research and landscape-based therapeutic strategies.

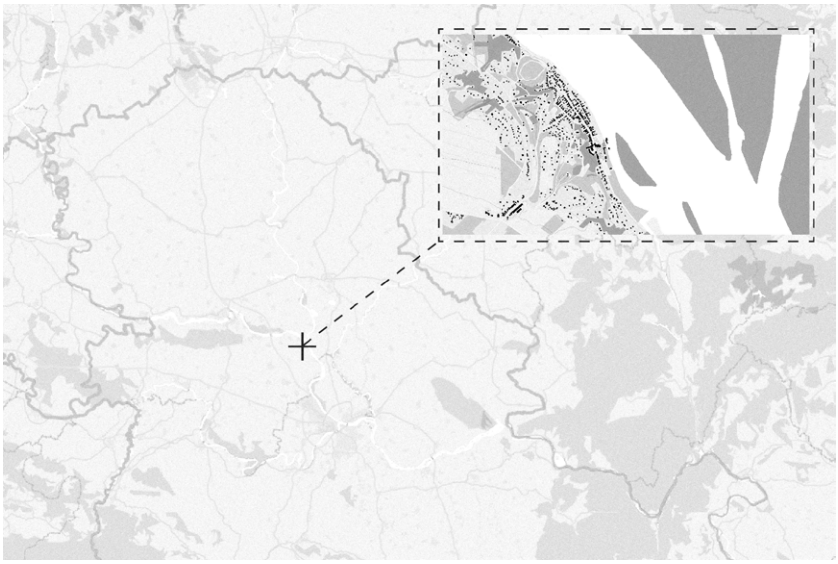


FIGURE 1. Spatial contextualization of the Stari Slankamen area
Source: MapTiler, n.d.

2. THEORETICAL FRAMEWORK

2.1. Therapeutic landscapes as spatial systems of well-being

The concept of therapeutic landscapes provides a foundational framework for understanding how spatial environments contribute to human health beyond the boundaries of formal medical institutions. Introduced within cultural geography and medical geography, the notion emphasises that healing is not produced solely through clinical intervention, but through the interaction between people, place, and meaning (Gesler, 1992). In this perspective, therapeutic effects emerge from a synergy of factors such as physical settings, social practices, symbolic values, and lived experiences, rather than from isolated environmental attributes.

Gesler's formulation marked a shift away from purely biomedical interpretations of health toward a relational understanding of space, in which landscapes function as active agents in therapeutic processes. Importantly, this approach acknowledges that landscapes operate simultaneously on multiple levels: as material environments shaped by natural and built elements; as social spaces structured by patterns of use, accessibility, and interaction; and as

symbolic spaces imbued with cultural meanings and collective memories. The therapeutic potential of a landscape thus resides not in any single component, but in the dynamic interplay among these layers.

Subsequent work by Williams (1998) further elaborated the experiential dimension of therapeutic landscapes, foregrounding concepts such as emotional attachment to place, subjective perception, and embodied experience. From this humanistic standpoint, healing environments are understood as spaces that support reflection, comfort, and a sense of belonging, often through everyday practices such as walking, resting, or social encounters. These experiences are deeply context-dependent and cannot be detached from the specific spatial and cultural configurations in which they occur.

Within spa environments, the relevance of therapeutic landscape theory becomes particularly pronounced. Spas are inherently place-bound institutions, relying on specific natural resources and historically developed spatial arrangements. However, when interpreted exclusively as medical facilities, their therapeutic scope is artificially narrowed. By contrast, when approached as therapeutic landscapes, spas can be understood as open spatial systems in which treatment extends into the surrounding environment, incorporating natural features, cultural heritage, and patterns of movement and perception. This shift in perspective provides the theoretical basis for examining spa territories not as isolated enclaves, but as integrated landscapes of well-being.

In the context of this study, the concept of therapeutic landscapes serves as the primary analytical lens for reassessing the Slankamen Spa area. Rather than focusing on clinical outcomes, the analysis emphasises spatial relationships, experiential qualities, and symbolic dimensions of the landscape. This framework legitimises the investigation of historical layers, protected natural areas, and cultural heritage as active components of a therapeutic environment, thereby setting the stage for a spatially oriented exploration of well-being.

2.2. Landscape, memory, and place attachment

While therapeutic landscape theory provides a broad framework for understanding healing environments, the concept of landscape memory introduces a critical temporal and cultural dimension. Landscapes are not static backdrops, but repositories of historical events, practices, and meanings that persist through spatial forms, material traces, and patterns of use. As Assmann (2011) argues, cultural memory is anchored in material and spatial media that enable societies to transmit meaning across generations. In this

sense, topography, built structures, and circulation routes function as carriers of memory, embedding past events into the lived experience of place.

The embeddedness of memory into landscape morphology plays a significant role in shaping place attachment, as preserved physical features and "urban reminders" mediate place memory and strengthen emotional bonds with place (Lewicka, 2008). Persistent spatial elements – such as paths, fortifications, landmarks, or riverbanks – create continuity between past and present, allowing historical narratives to be encountered through everyday movement and perception. These spatial traces do not merely represent history; they actively structure how individuals experience and interpret their surroundings. Through repeated engagement, landscapes of memory foster emotional bonds and a sense of identity rooted in place.

Within the framework of therapeutic landscapes, such mnemonic dimensions acquire particular significance. Emotional attachment to place has been identified as a key factor in restorative experiences, contributing to feelings of security, familiarity, and meaning. When individuals engage with landscapes that convey historical depth and cultural significance, the therapeutic effect is amplified by narrative and symbolic layers that extend beyond sensory perception alone. The landscape thus becomes a medium through which personal experience intersects with collective memory.

For spa landscapes, this relationship between memory and place attachment is especially relevant. Many spa sites are historically layered environments, shaped by long-term interactions between natural resources and human activity. The persistence of historical spatial structures – whether in the form of settlement patterns, infrastructural corridors, or commemorative landmarks – offers opportunities to interpret these environments as landscapes of memory. Engaging with such spaces through walking, observation, and interpretation can strengthen experiential continuity and enhance the holistic character of therapeutic settings.

In this research, the concept of landscape memory provides a theoretical justification for the analysis of historical cartographic sources and their comparison with contemporary spatial configurations. By identifying enduring spatial axes and corridors, the study seeks to reveal how historical events remain inscribed in the present-day morphology of Stari Slankamen. This approach positions memory not as an abstract cultural category, but as a spatial phenomenon that can be examined through mapping and morphological analysis, thereby linking heritage research directly to the study of therapeutic landscapes.

2.3. Cultural landscape and cultural ecosystem services as operational tools

In order to translate the abstract principles of therapeutic landscapes and landscape memory into a spatially analyzable framework, this study draws on the concept of the cultural landscape and the notion of cultural ecosystem services. Unlike the regulatory framework that treats nature and culture as separate domains, the cultural landscape concept explicitly recognises landscapes as the combined outcome of natural processes and long-term human activity. According to UNESCO, cultural landscapes represent the "combined works of nature and of man," emphasising the inseparability of environmental features and cultural practices in shaping lived space (UNESCO World Heritage Centre, n.d.).

This integrative understanding is particularly relevant in historically layered spa environments, where natural resources, settlement patterns, and built structures have co-evolved over extended periods. Within such contexts, cultural heritage cannot be reduced to isolated monuments, nor can natural areas be understood solely as ecological reserves. Instead, both constitute interdependent layers of a single spatial system. The concept of the cultural landscape, therefore, provides a theoretical justification for examining cultural and natural heritage as overlapping spatial phenomena rather than as administratively or functionally separate entities.

To further operationalise this integrative perspective, the study adopts the framework of cultural ecosystem services (CES). CES refer to the non-material benefits that people derive from ecosystems, including aesthetic appreciation, recreation, spiritual enrichment, sense of place, and connections to cultural identity and history (Millennium Ecosystem Assessment, 2005; Daniel et al., 2012). These services are inherently experiential and relational, aligning closely with the emphasis on perception, meaning, and attachment found in therapeutic landscape theory.

Importantly, the CES framework offers a vocabulary through which sensory and symbolic qualities of landscapes can be discussed without resorting to clinical or biomedical indicators. In the context of spa landscapes, CES, such as attention restoration, stress reduction, aesthetic experience, and engagement with cultural narratives, provide a means of articulating how protected natural areas and heritage assets contribute to well-being. While these effects are not measured quantitatively in this study, the CES perspective legitimises their consideration as spatial potentials embedded within the landscape.

Within this research, the concepts of cultural landscape and cultural ecosystem services function as operational tools that enable the translation of theoretical insights into spatial analysis. Cultural heritage sites, protected natural zones, and historically persistent spatial structures are treated as tangible proxies through which experiential and symbolic dimensions of well-being can be inferred. This approach enables the study to transition from abstract discussions of healing and memory to a concrete examination of how cultural and natural layers intersect within a specific territorial context.

2.4. Conceptual synthesis: from theory to spatial analysis

Bringing together the preceding theoretical perspectives, this study conceptualises the spa landscape as an integrated spatial system in which therapeutic potential emerges from the interaction of natural features, cultural heritage, and historically embedded spatial structures. Therapeutic landscape theory provides the overarching framework by positioning space as an active participant in processes of well-being. The concept of landscape memory introduces a temporal dimension, emphasising the role of historical continuity and cultural meaning in shaping place attachment. Finally, the notions of cultural landscape and cultural ecosystem services offer an operational language through which these abstract concepts can be examined spatially.

Based on this synthesis, the research adopts a spatial-analytical approach centred on three interrelated components. First, landscape memory is examined through the identification of persistent spatial axes, corridors, and morphological traces derived from the comparison of historical and contemporary cartographic sources. These elements are understood as material expressions of collective memory, embedding past events and practices into the present-day landscape. Second, cultural heritage is addressed through the spatial distribution of immovable cultural assets, which represent focal points of historical and symbolic significance. Third, natural heritage is considered through existing protection regimes, whose spatial extents define areas of ecological, aesthetic, and environmental value.

The intersection of these components forms the analytical core of the study. By overlaying historical spatial structures with the distribution of cultural monuments and protected natural zones, the research identifies areas where cultural and natural layers converge, as well as areas where they remain fragmented or disconnected. These overlaps are interpreted as zones with heightened potential for cultural ecosystem services and, by extension, for

therapeutic landscape development. Conversely, areas of separation highlight spatial and institutional discontinuities that may limit holistic experiences of well-being.

This conceptual framework directly informs the methodological design of the study. Rather than measuring well-being outcomes, the analysis focuses on spatial configurations that enable or constrain therapeutic experiences. Mapping and comparative cartographic analysis are thus employed not as descriptive tools, but as interpretive methods for revealing the latent relationships between memory, heritage, and protected nature. Through this approach, the spa landscape is redefined as a dynamic field of interaction in which historical depth, environmental protection, and experiential qualities collectively shape the conditions for sensory and emotional well-being.

3. METHODOLOGY

3.1. Research approach and scope

This study adopts a qualitative, interpretative spatial-research approach grounded in landscape and heritage studies. Rather than aiming to quantify well-being outcomes, the research seeks to identify spatial configurations and heritage vs. nature relationships that enable therapeutic and restorative experiences. The methodological framework is aligned with the concept of therapeutic landscapes and landscapes of memory, emphasising spatial continuity, symbolic meaning, and experiential potential.

The research design is structured around three complementary methodological steps:

(1) a focused review of selected literature that motivated the initiation of the study;

(2) observational abstraction of persistent spatial elements from historical and contemporary cartographic sources; and

(3) spatial overlay mapping of cultural and natural heritage protection regimes.

Together, these steps enable a synthesis of historical, cultural, and environmental layers into a coherent analytical framework.

3.2. Focused literature review as research motivation

The research builds upon a targeted selection of scholarly works that directly informed the formulation of the research problem and methodological approach. These studies established the conceptual relevance of therapeutic landscapes, cultural ecosystem services, and the relationship between heritage and well-being, thereby providing the intellectual impetus for initiating the present investigation.

Key contributions include Gesler's (1992) foundational articulation of therapeutic landscapes, which framed healing as a spatial and experiential phenomenon, and Williams's (1998) emphasis on emotional and experiential attachment to place. Together, these works justified the spatial and phenomenological orientation of the study. The relevance of cultural and natural heritage for well-being was further supported by research on cultural ecosystem services (Millennium Ecosystem Assessment, 2005; Daniel et al., 2012) and by recent studies demonstrating the restorative and psychological benefits of engaging with green cultural heritage (Xie et al., 2023).

Additional motivation for the research was drawn from studies addressing heritage and well-being beyond traditional cultural institutions, including investigations into heritage-based interventions and memory-oriented practices (Thomson et al., 2017; D'Andrea et al., 2022). In combination, these works highlighted the potential of heritage-rich landscapes to support sensory, emotional, and cognitive dimensions of well-being, while also revealing a gap in spatially explicit methodologies applicable to spa landscapes and protected areas.

3.3. Observational abstraction of spatial memory elements

The second methodological step consists of an interpretative observation and abstraction of spatial elements derived from historical and contemporary cartographic materials. The primary sources for this step include an early-eighteenth-century map depicting the Battle of Slankamen (created: 1702) and an image obtained from a contemporary open-source mapping platform – MapTiler. These maps are treated not as objects of strict cartographic comparison but as spatial documents that enable the identification of recurring morphological features across time.

Through close visual inspection and interpretative reading, similar spatial elements were identified and abstracted from both sources.

These elements include:

- dominant directional axes aligned with the fortress and the settlement core;
- persistent corridors and spots corresponding to historic movement routes;
- spatial relationships between elevated terrain, riverbanks, and defensive structures;
- traces of former river courses and embankment configurations influencing contemporary land use.

Rather than measuring geometric correspondence, the analysis focuses on the persistence of spatial logic and orientation. This process of data abstraction allows historical memory to be understood as a morphological phenomenon, embedded in the terrain and urban structure of Stari Slankamen. The extracted elements serve as indicators of spatial continuity and as potential carriers of collective memory, forming the basis for subsequent synthesis with heritage and protection layers.

3.4. Spatial overlay of cultural and natural heritage protection regimes

The third methodological step involves the spatial overlay of cultural and natural heritage datasets in order to assess their degree of interconnection and potential for the development of memory-based therapeutic landscapes. Data on protected natural areas and their protection regimes (Zones 2 and 3) were obtained from the *GeoSrbija* platform and relevant legal documents, while information on immovable cultural heritage assets was drawn from official heritage registers.

Using cartographic overlay techniques, the spatial positioning of cultural monuments was examined in relation to the boundaries of protected natural areas. This process made it possible to identify zones of overlap, partial intersection, and separation between cultural and natural heritage layers. Based on these spatial relationships, the study delineates three areas characterised by differing levels of cultural–natural integration.

These areas are not interpreted as finalised planning zones, but as analytical categories that reveal latent opportunities for developing memory-oriented and restorative landscape interventions. The overlay analysis thus functions as a diagnostic tool, highlighting spatial configurations where cultural ecosystem services and therapeutic landscape potentials are most likely to emerge.

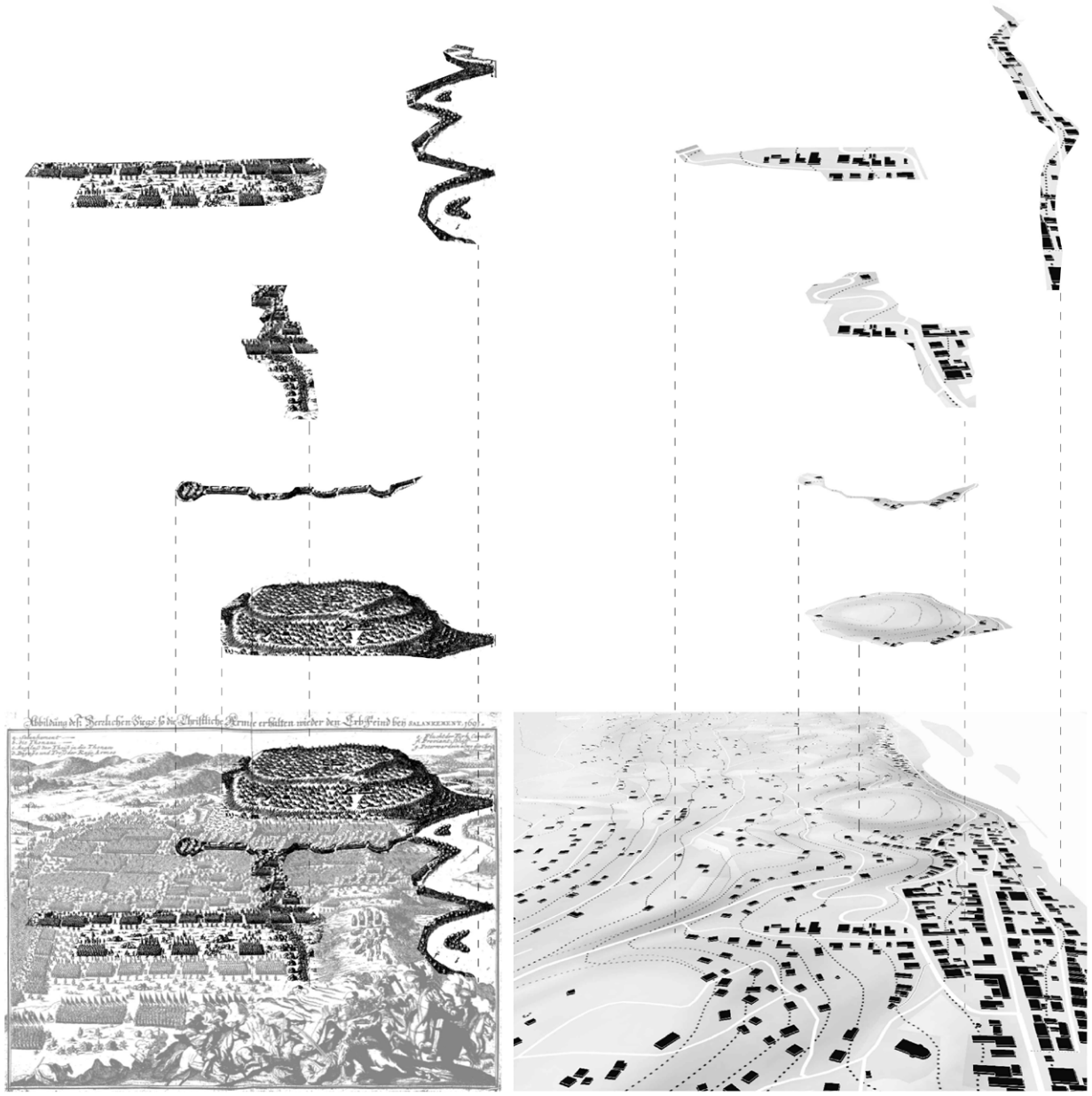


FIGURE 2. Interpretative observation and abstraction of spatial elements derived from historical and contemporary cartographic materials: (a) historical engraving of the Battle of Slankamen area, 18th century; (b) contemporary topographic map abstraction. Sources: (a) Wikimedia Commons (public domain); (b) MapTiler Cloud (n.d.).

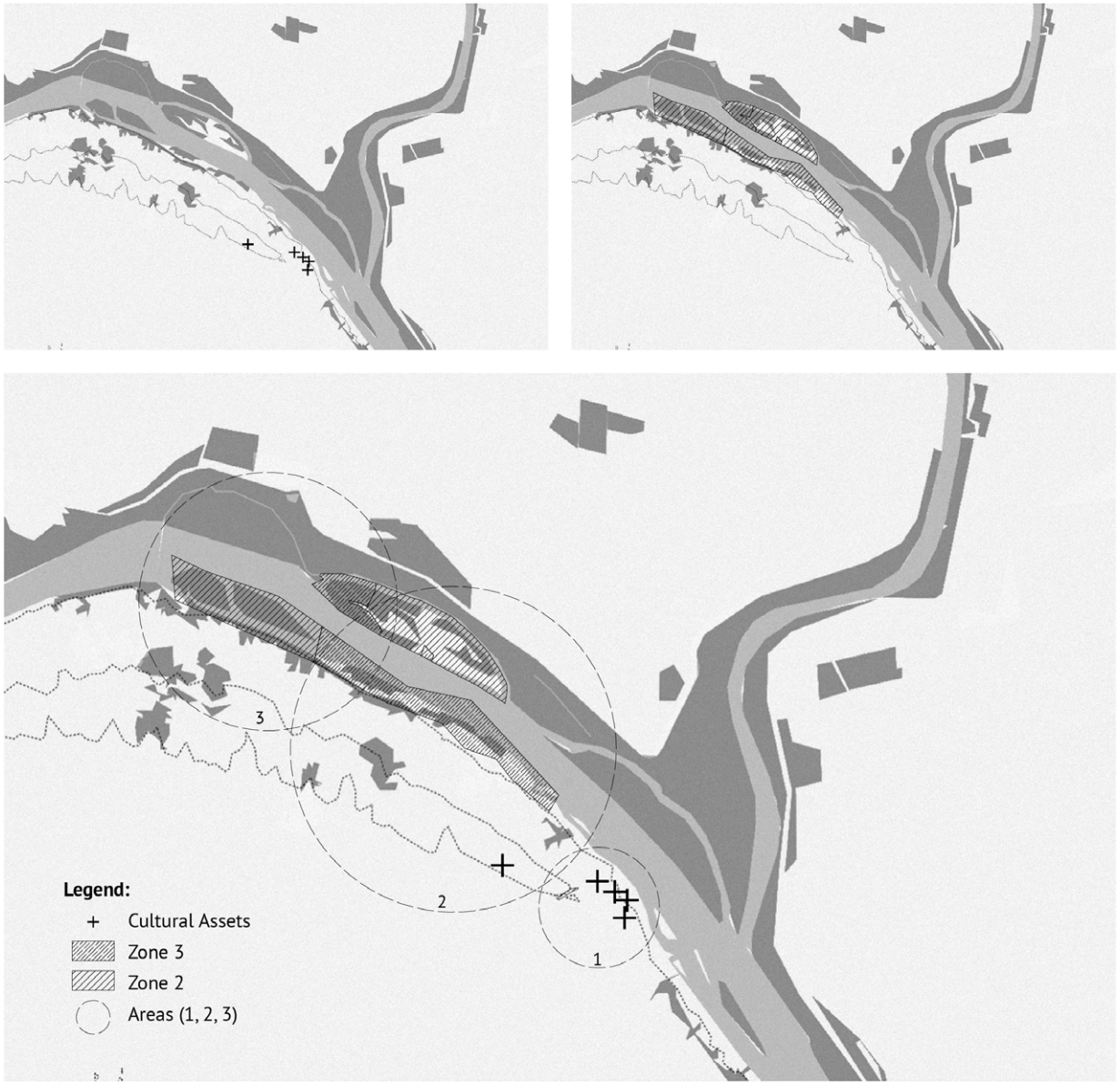


FIGURE 3. Spatial overlay of cultural and natural heritage datasets
Source: MapTiler, n.d.

3.5. Methodological limitations

The research is subject to several limitations. The historical map used in the analysis varies in scale and precision, which restricts the possibility of exact spatial alignment with contemporary map imagery. Furthermore, the study relies primarily on cartographic and desk-based analysis, without extensive field verification or user-based evaluation of experiential effects. Consequently, the findings should be interpreted as indicative rather than definitive, serving as a conceptual and spatial foundation for future, more detailed investigations.

4. ANALYSIS AND RESULTS

4.1. Analytical orientation

The analysis follows directly from the methodological framework outlined above and is structured in accordance with the three-step research approach. Rather than evaluating therapeutic effects directly, the analysis focuses on identifying spatial configurations and heritage–nature relationships that enable the emergence of memory-oriented and restorative landscape potentials. The results are therefore interpretative in nature and grounded in cartographic observation, spatial abstraction, and overlay mapping.

4.2. Abstraction of persistent spatial elements and memory structures

The observational abstraction of spatial elements from historical and contemporary cartographic sources revealed a number of persistent morphological features that structure the landscape of Stari Slankamen. Through interpretative reading of the early-eighteenth-century battlefield map and the contemporary orthophotographic image, several shared spatial characteristics were identified.

First, a dominant directional axis aligned with the position of the Slankamen fortress remains legible in the present-day settlement structure. This axis continues to organise movement and visual orientation within the settlement, indicating a long-term persistence of spatial logic rooted in historical defence and control of territory.

Second, a network of corridors corresponding to historic movement routes can be discerned in the contemporary landscape. These corridors follow topographic conditions and connect elevated terrain with the riverbank, reflecting a continuity between historic and present-day patterns of access and movement.

Third, the relationship between the built environment and the river landscape demonstrates morphological continuity. Traces of former river courses and embankment configurations, visible in the historical map, correspond to present-day landforms and settlement edges, suggesting that hydrological and defensive considerations have had a lasting influence on spatial organisation.

Together, these elements constitute material expressions of landscape memory. Rather than representing isolated historical remnants, they form a coherent spatial structure through which past events and practices remain embedded in the contemporary morphology of Stari Slankamen. These persistent features provide the spatial foundation for interpreting the area as a landscape of memory with potential therapeutic significance.

4.3. Spatial distribution of cultural and natural heritage assets

Building upon the abstraction of spatial memory structures, the analysis proceeded with the examination of the spatial distribution of cultural and natural heritage assets. Data obtained from official heritage registers and the "GeoSrbija" platform revealed a distinct pattern in the territorial organisation of protected elements.

Protected cultural heritage assets are distributed across the settlement as discrete points, each subject to individual protection status. These monuments include archaeological sites, historic buildings, religious structures, and commemorative landmarks. While collectively representing a rich cultural layer, their spatial isolation limits their perceptual and functional integration into a broader landscape experience.

In contrast, protected natural heritage is organised into contiguous zones defined by different protection regimes. The protected area known as "Riverine Islands and Escarpments near Slankamen [Ade i odseci kod Slankamena]" preserves paleofloristic localities containing fossilised remains of tropical and subtropical vegetation, along with numerous examples of fossil fauna that testify to the evolution and extent of the former Pannonian Sea. Areas under active protection (Zone 2) and proactive protection (Zone 3) form continuous spatial systems characterised by ecological value, landscape quality, and relative inaccessibility. The active protection regime primarily includes aspects of nature and resource conservation, while the proactive regime introduces the domains of cultural-historical heritage and traditional architecture (Article 35, Paragraphs 4, 5, 7, and 8 of the Law on Nature Protection). These zones possess strong potential for restorative and sensory experiences but are not systematically linked to cultural heritage sites.

This spatial distinction between point-based cultural assets and area-based natural protection highlights an underlying fragmentation between cultural and natural heritage layers. Identifying locations where these layers intersect becomes critical for understanding opportunities for integrative therapeutic landscapes.

4.4. Overlay mapping and delineation of analytical areas

The overlay mapping of cultural heritage assets and natural protection regimes resulted in the identification of three analytical areas characterised by differing degrees of cultural–natural interconnection.

Area 1 corresponds to the central part of the settlement, where the highest concentration of protected cultural monuments coincides with a segment of natural heritage under active protection. Mapped cultural assets within the considered area are the Church of St. Nicholas, the birthplace of Đorđe Natošević, the house in Stjepan Radić Street, where in the basement there are the remains of a Ottoman bath with built-in materials dating back to the Roman period, and finally the remains of a medieval fortress built over a Roman fortification – the Acumincum (Republic Institute for the Protection of Cultural Monuments, n.d.). Due to its accessibility and proximity to the existing spa facilities, this area exhibits the strongest potential for integration into therapeutic and cultural landscape infrastructure. The spatial overlap suggests opportunities for reinforcing place attachment through everyday engagement with both heritage and natural features.

Area 2 extends toward the zone surrounding the monument commemorating the Battle of Slankamen and adjacent landscapes under proactive protection. The area involved is distinguished by the intersection of natural and cultural strata, which is less dense but nonetheless noteworthy. Its open character and historical associations support the development of outdoor memory-oriented and restorative spaces, particularly through walking routes and interpretative landscape elements.

Area 3 encompasses the furthest protected environment from the urban surroundings and also the island territory across the river, which is subject exclusively to natural protection regimes. While this area offers a high degree of ecological integrity and immersive natural experience, it lacks direct spatial overlap with cultural heritage assets. Within the scope of this study, Area 3 is therefore interpreted as possessing limited potential for memory-based therapeutic landscapes, while retaining value as a complementary natural environment.

4.5. Synthesis of results

The combined results of observational abstraction and overlay mapping confirm that the landscape of Stari Slankamen exhibits varying degrees of spatial integration between memory, heritage, and protected nature. Areas such as Area 1, where historical spatial structures, cultural assets, and natural protection overlay demonstrate the strongest potential for therapeutic landscape development grounded in cultural ecosystem services.

These findings support the central premise of the study: that therapeutic potential in spa landscapes extends beyond medical facilities and can be spatially identified through the analysis of landscape memory and heritage–nature relationships. The delineated areas provide an analytical foundation for further discussion on landscape-based strategies aimed at enhancing sensory and emotional well-being.

5. DISCUSSION

The results of this study confirm that the therapeutic potential of spa environments goes beyond the mere presence of medical facilities or natural healing resources. Instead, the analysis demonstrates that therapeutic landscapes emerge through the spatial interweaving of natural features, cultural heritage, and historically embedded morphological structures. In the case of Stari Slankamen, this interweaving is neither uniform nor accidental, but shaped by long-term interactions between geography, historical events, and contemporary protection frameworks.

Interpreted through the lens of therapeutic landscape theory, the identified spatial structures and heritage–nature overlaps can be understood as enabling conditions for holistic well-being. As articulated by Gesler and Williams, therapeutic effects arise from the interaction of physical settings, symbolic meanings, and lived experience. The persistent spatial axes and corridors identified in the analysis function as materialised anchors of memory, structuring movement, orientation, and perception. These features support place attachment by providing continuity between past and present, thereby reinforcing emotional and experiential connections to the landscape.

The abstraction of spatial memory elements highlights the importance of historical morphology as an active component of contemporary landscape experience. Rather than representing static remnants of the past, the identified axes, corridors, and river-related landforms continue to shape everyday spatial

practices. In this sense, the landscape of Stari Slankamen operates as a medium of cultural experience, in which memories of historical events – most notably the Battle of Slankamen – remain embedded within the terrain and settlement structure. This mnemonic dimension contributes to the therapeutic properties of the landscape by providing a sensory experience with historical significance and symbolic meaning.

The overlay analysis of cultural and natural heritage further reveals a structural tension between point-based and area-based protection regimes. Cultural heritage assets, protected as isolated monuments, remain spatially fragmented, while natural heritage is organised into continuous spaces governed by ecological criteria. This institutional and spatial separation limits the potential for integrated landscape experiences. However, the delineation of Areas 1 and 2 demonstrates that despite this fragmentation, zones of meaningful overlap do exist in situ. These areas concentrate cultural memory, accessibility, and protected natural environments, making them particularly suitable for the development of memory-oriented therapeutic landscapes.

From the perspective of cultural ecosystem services, these overlapping zones can be interpreted as areas with heightened potential for non-material benefits such as aesthetic appreciation, attention restoration, sense of place, and engagement with cultural narratives. Importantly, these benefits are not inherent properties of individual heritage assets or natural features, but emerge through their spatial configuration and accessibility. The findings thus support the argument that therapeutic potential is a relational quality of landscape, produced through the interaction of cultural and natural elements rather than through their isolated presence.

Area 1, located in the settlement core, exemplifies this relational potential most clearly. Its proximity to the existing spa facilities, combined with the density of cultural monuments and protected natural spaces, creates conditions for everyday engagement with heritage-rich environments. Such engagement can support restorative experiences through routine practices such as walking and observation. Area 2, while spatially less concentrated, offers opportunities for more contemplative and narrative-based experiences, particularly through the development of interpretative routes linked to historical events and open landscapes. In contrast, Area 3 illustrates the limitations of purely natural protected environments in supporting memory-based therapeutic landscapes when cultural layers are absent, despite its ecological and sensory value.

The discussion also highlights broader implications for the planning and management of spa landscapes in post-socialist contexts. The spatial fragmentation observed in Stari Slankamen reflects wider processes of the post-socialist transition. By revealing latent connections between heritage and protected nature, the study suggests that landscape-based approaches can serve as mediating frameworks capable of reconnecting fragmented spatial systems. Rather than introducing new large-scale interventions, such approaches emphasise the reinterpretation and reactivation of existing landscape structures.

From an architectural and landscape-architectural perspective, the findings underscore the importance of viewing spa environments as open systems rather than enclosed clinical complexes. Therapeutic landscapes are shown to operate across scales – from regional protected areas to local corridors – requiring integrative design strategies that engage with cultural memory, landscape morphology, and environmental protection simultaneously. The concept of memory-oriented therapeutic routes emerges as a particularly promising strategy, offering a means of linking heritage nodes, natural zones, and experiential sequences into coherent spatial narratives.

Finally, the study demonstrates the value of interpretative spatial analysis as a methodological approach in heritage and landscape research by focusing on spatial relationships and morphological persistence. The research provides insights into the experiential and symbolic dimensions of well-being that are often overlooked in conventional planning frameworks. While the findings are context-specific, the analytical logic and mapping protocol developed in this study are transferable to other spa landscapes and protected areas with rich cultural and natural heritage.

6. CONCLUSIONS AND RECOMMENDATIONS

This research set out to examine whether spa environments can be reinterpreted as integrative therapeutic landscapes through the spatial interweaving of cultural and natural heritage. Focusing on the case of Stari Slankamen, the study demonstrated that therapeutic potential extends beyond medical facilities and mineral water springs, emerging instead from historically embedded spatial structures, protected natural environments, and cultural memory. By adopting a landscape-based perspective, the research contributes to a broader understanding of how well-being can be supported through spatial continuity, experiential richness, and place attachment.

The analysis confirmed that the landscape of Stari Slankamen contains persistent morphological elements that function as carriers of memory. Spatial axes, circulation corridors, and river-related landforms derived from historical cartographic sources remain legible in the contemporary settlement structure, allowing a flow of past events into everyday spatial experience. These findings support the interpretation of the area as a landscape of memory, in which historical depth and spatial continuity enhance the experiential and symbolic dimensions of place.

Through overlay mapping of cultural and natural heritage protection regimes, the study identified three analytical areas characterised by differing degrees of cultural–natural integration. Areas where protected natural zones intersect with concentrations of cultural heritage assets (particularly Areas 1 and 2) were shown to possess the strongest potential for the development of memory-oriented therapeutic landscapes. These areas combine accessibility, narrative depth, and environmental quality, creating favourable conditions for sensory restoration and emotional engagement. In contrast, areas lacking cultural heritage overlap, while ecologically valuable, were found to offer more limited potential for memory-based therapeutic experiences within the scope of this research.

From a theoretical standpoint, the study reinforces the relevance of therapeutic landscape theory by demonstrating its applicability to heritage-rich spa environments. By integrating concepts of landscape memory, cultural landscape, and cultural ecosystem services, the research advances an interdisciplinary framework that links spatial morphology, heritage studies, and environmental psychology. Importantly, the study illustrates how these concepts can be operationalised through interpretative spatial analysis and mapping, offering a methodological contribution to landscape and architectural research.

The findings also carry practical implications for the planning and management of spa landscapes, particularly in post-socialist contexts characterised by spatial fragmentation and institutional separation between cultural and natural heritage protection. Rather than proposing large-scale redevelopment, the research emphasises the potential of landscape-based strategies that reinterpret and reconnect existing spatial structures. The development of memory-oriented therapeutic routes, interpretative landscapes, and green cultural infrastructure emerges as a promising approach for enhancing holistic well-being while respecting existing protection frameworks.

As a pilot study, this research has certain limitations due to its reliance on cartographic analysis and the absence of empirical user-based evaluation. Any future research should be conducted through fieldwork, participatory methods, and interdisciplinary collaboration among architects, landscape architects, conservators, and health professionals. Such studies could further explore how engagement with cultural–natural landscapes contributes to measurable aspects of well-being and inform the design of inclusive, place-sensitive therapeutic environments.

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LANDSCAPE STRUCTURE AS A MORPHOLOGICAL FRAMEWORK OF SPA SETTLEMENTS IN VOJVODINA'S PANNONIAN BASIN - A COMPARATIVE STUDY

ABSTRACT

The spatial formation of spa settlements in Vojvodina, within the broader context of the Pannonian Basin, reveals a strong yet underexplored relationship between natural landscape conditions and urban morphology. This paper centres on three spa landscapes: Rusanda, Kanjiža and Stari Slankamen – each embedded within a specific environmental setting defined by landform morphology, microclimate and vegetation - providing a framework for this analysis. Using a landscape-driven morphological approach, the study analyses the spatial configuration of each settlement in relation to its surrounding landscape. The aim is to reveal the diversity and specificity of landscape structures within this seemingly uniform lowland territory through a qualitative reading of three spatial models, rather than to construct a comprehensive typology. In doing so, this research highlights the internal landscape variability of the Pannonian Basin, a fragile, layered and ecologically complex system, and addresses the underrepresentation of landscape structure as a morphological agent in architectural and urban discourse. Spa settlements, more than other urban forms, sustain a direct, enduring spatial and functional dialogue with the natural systems that support them, exposing the extent to which landscape structure not only informs their morphology, but actively shapes their spatial logic and identity.

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KEY WORDS

SPA LANDSCAPE

LANDSCAPE STRUCTURE

MORPHOLOGY, VOJVODINA

PANNONIAN BASIN

COMPARATIVE ANALYSIS

1. INTRODUCTION

A word on spa settlements - and landscapes as well

Spa settlements are more than healing springs; they are spatial phenomena in which natural resources, human activity, and cultural practices converge, shaping distinctive landscapes and settlement forms that reflect the dynamic interplay between nature and society. Historically, spas developed as sites of health and recreation, gradually taking on social, cultural, and economic roles, while their environmental setting dictated the possibilities and limits of their spatial and architectural organisation. While hydrological, geological, and tourism-focused studies have extensively documented these areas (Laškov, 1982), their spatial morphology, the ways in which built form responds to landscape structure, remains largely unexplored. In Serbia, spatial planning first formally acknowledged spa settlements in the 1996 Spatial Plan, recognising natural healing factors, location, and transport connections (Stevanović, 2009), yet typological and morphological definitions remain inconsistent.

From a spatial perspective, spa settlements emerge in diverse contexts, alongside settlements, in valleys, clearings, or other specific landscapes, yet always anchored by springs as defining starting points. Their architecture and urban layout create platforms that allow people to access and experience nature, making built structures integral to human-environment interaction. In this sense, spas are a tangible expression of the intersection between human activity and the natural landscape. As an anthropogenic landscape element, a spa settlement can be understood as a spatial and ecological organism that evolves from the landscape in which it is embedded. They become a lens through which the relationship between landscape structure and built form can be read, revealing how architecture mediates human access to nature and how landscape, in turn, structures human space.

The central question of this research is how the spatial morphology of spa settlements reflects and responds to the landscape structure in which they are embedded. Within this framework, three interconnected hypotheses are proposed. First, landscape structure actively conditions the spatial identity and internal organisation of spa settlements, shaping their form, hierarchy, and spatial relationships. Second, the morphology of spa settlements represents a specific mode of interpreting and adapting to the landscape: through their

spatial form and organisation, spa settlements articulate the relationship between natural systems and human intervention, functioning as an interface between the two. Third, even within a seemingly homogeneous ecosystem, subtle variations in landscape structures are expected to generate distinct morphological expressions, revealing how local environmental conditions translate into different spatial and architectural patterns. This framework bridges the gap between landscape and morphological studies in architectural and urban discourse, highlighting the spa settlement as a spatial mediator between natural environment and built form.

The aim of the research is threefold: to identify representative landscape structures within the Pannonian Basin, to analyse the morphology of selected spas in relation to these structures, and to interpret how differences in landscape conditions manifest in spatial form. Through this comparative, qualitative landscape-driven morphological approach, the study situates spa settlements within their environmental context, interpreting them as spatial expressions of landscape logic.

The relevance of this approach lies in repositioning the spa within contemporary architectural and planning discourse. Understanding spas through their landscape structures opens a new perspective on sustainable planning - one that reads spatial form as a record of ecological processes and cultural adaptation. By doing so, it aligns with the principles of the European Landscape Convention (Council of Europe, 2000), which defines landscape as the result of the interaction between natural and human factors. In this sense, the study contributes to the ongoing dialogue on how landscapes are perceived, interpreted, and planned, not as static entities, but as living structures that continuously shape and are shaped by human activity.

Building on this, the study transitions to a conceptual framework connecting landscape structure and morphology, situating their position and interpretation within the research. The spatial context is first defined and explored, aiming to characterise its structure and convey its image. Landscape structures within this broader ecosystem are identified using three structural criteria to capture their spatial logic and diversity. These landscapes, treated as distinctive cases, are then illustrated, highlighting the spa settlements embedded within them. The morphology of these spas is analysed in relation to their landscapes, showing how spatial form, hierarchy, and organisation respond to natural structures. Finally, the two analytical levels converge in a comparative approach, revealing the relationships and dynamics between landscape structures and spa settlement morphology.

2. CONCEPTUALISING LANDSCAPE STRUCTURE AND MORPHOLOGY

Landscape, as a concept, is complex and multidimensional, shared across disciplines such as geography, ecology, and architecture, and interpreted through visual, ecological, and territorial perspectives. Contemporary theoretical discourse, by contrast, increasingly understands landscape as a relational and processual construct, produced through the ongoing interaction of natural and constructed elements (Corner, 1999; Spirn, 1998; Waldheim, 2006). In this research, the notion of landscape structure is introduced to emphasise this systemic dimension from a spatial perspective. Following the principles of landscape ecology (Forman & Godron, 1986), this notion refers to the arrangement and interrelation of natural elements: landforms, water systems, soils, and vegetation, forming a coherent spatial matrix. This perspective enables the natural component of landscape to be understood as an active spatial system rather than a passive setting, conditioning patterns of occupation, movement, and use. Within spa settlements, where natural healing resources are inseparable from spatial organisation, such a structural reading of landscape becomes particularly relevant.

Morphology provides a complementary analytical lens for interpreting spatial form and organisation. Rooted in the study of settlement structure and evolution, morphological research has traditionally focused on the internal composition of the built environment - plots, streets, buildings, and their hierarchical relationships, as articulated by Muratori and later developed within the Italian and British schools of urban morphology (Cataldi, Maffei & Vaccaro, 2002; Conzen, 1960). Morphological analysis reads spatial form as a material record of social, cultural, and functional processes, revealing the internal logic through which settlements are structured and transformed over time (Moudon, 1997).

While both landscape studies and morphological studies address spatial structure, they have often developed along parallel trajectories. Landscape is frequently treated as an external condition, while morphology focuses on the autonomous organisation of built form. This conceptual separation obscures the ways in which spatial form emerges through continuous interaction between environmental structure and human intervention. As emphasised by Conzen (1960) and Moudon (1997), the natural setting, spatial layout, and functional organisation together constitute an integrated system. Building on this understanding, morphology is here extended beyond the internal structure of the built environment to include its relationship with landscape structure.

Within this framework, spa settlements are approached as particularly revealing spatial configurations, in which landscape structure functions as an operative rather than a representational element. Water, vegetation, microclimate, and terrain directly condition both function and form, making spa settlements an appropriate field for examining how landscape structure informs spatial organisation and morphological differentiation. By positioning landscape structure and morphology as interdependent analytical categories, this study establishes a conceptual foundation for the methodological approach that follows. Accordingly, the research proceeds through a layered spatial reading, moving from the characterisation of broader landscape structures toward the analysis of spa settlements as specific morphological configurations embedded within them, enabling a comparative interpretation of their spatial logic across multiple scales.

3. METHODS AND MATERIALS

3.1 Methodological framework

The research adopts a qualitative and interpretative methodological approach, grounded in the principles of landscape and urban morphology, prioritising a spatial reading of spa settlements as expressions of their environmental context. The approach is structured in two main analytical phases. The first defines and illustrates the landscape structures of the Pannonian Basin through a set of criteria, while the second examines the morphology of spa settlements within these landscape frameworks. Together, these phases form a coherent methodological sequence, from contextual positioning to morphological interpretation, enabling a comparative analysis of how landscape structure informs the spatial structure of spa settlements.

This approach builds upon theoretical foundations established in landscape ecology (Forman & Godron, 1986), geomorphological process theory (Ritter et al., 1995), and the tradition of urban morphology (Conzen, 1960; Moudon, 1997). Recent contributions further refine the interface between territory, landscape and urban form, exploring the reciprocal relation of territorial structure and urban morphology (Neglia, 2024). The integration of these domains allows the morphology of spa settlements to be interpreted as a hybrid system, shaped simultaneously by natural structure and human intervention.

The first phase of analysis addresses the landscape structure of the Pannonian Basin, within which Vojvodina’s spa settlements are located. Grounded in the fact that the spatial structure of the Pannonian Basin has

already been clearly defined through geomorphological and hydrogeological research (Filipović, 2003; Marković, 1973), this study acknowledges and builds on them, using that established knowledge, using it as a spatial reference framework. The aim is to approach them interpretatively, illustrating the landscape diversity through three analytical criteria: relief, microclimate, and vegetation. This landscape characterisation, derived from landscape ecology and environmental geography, serves to construct a comparative framework for the selected spa landscapes, translating them into operative categories for the subsequent morphological analysis of spa settlements. Relief provides the physical foundation and defines the morphological boundaries of the landscape, microclimate reflects the atmospheric and hydrological processes that influence local ecological conditions, and vegetation acts as both an indicator and an active component of landscape structure. By applying these consistent criteria, the analysis captures the spatial logic of each landscape and its capacity to shape specific environmental and morphological conditions. This interpretative basis serves to verify and contextualise the selection of three case studies: Rusanda, Kanjiža, and Stari Slankamen, each representing a distinct landscape within the lowland ecosystem of the Pannonian Basin.

Building upon the landscape framework established in the first phase, the second analytical stage focuses on the morphological structure of the selected spa settlements, and is conducted through three interpretative levels, where the relationship between landscape structure and spa morphology becomes legible at different spatial scales. Each case study is approached through its spatial definition, understood not only as an administrative or protected area, but as a material and functional entity embedded within its landscape context. Where available, the boundaries of the spa were determined according to the officially determined spa settlement area, recognising its spatial structure through the defined core and protective zones. This provided analytical consistency and allowed for comparability across cases. In the case of Stari Slankamen, where such documentation was absent, the spatial extent was reconstructed on the basis of the physical and functional components directly related to the spa: the spring, the park, therapeutic and accommodation facilities, and their immediate setting, as identified from available maps and plans.

To operationalise this analytical framework, the study is structured through three interrelated levels of interpretation, each addressing a different scale of spatial organisation and relation to the landscape. Morphological interpretation across these levels is guided by fundamental aspects of spatial form: position, size and form (Đokić, 2004), which are examined relationally across scales in relation to landscape structure:

I - *Territorial and Spatial Context*

The first level examines the position of each spa within its wider settlement and landscape system, its territorial reach, and relation to the surrounding settlement, infrastructure, and protective zones. This establishes the spa's spatial logic and hierarchy, clarifying how it occupies and structures its immediate environment.

II - *Structure and Morphology*

The second level addresses the internal organisation of the spa complex. It focuses on the distribution of functional zones, the arrangement and typology of buildings, and the hierarchy of open and built spaces. The spa is interpreted as an integrated spatial composition shaped by both functional and morphological principles.

III - *Relation to Landscape Structure*

The third level explores the interaction between the spa and its natural setting, the integration of topography, water, and vegetation into spatial form. Here, the landscape acts as an active determinant, guiding spatial organisation and defining the identity of the spa.

2.2 Materials

To support this analysis, a comprehensive body of primary and secondary sources was examined, including spatial municipal plans, general and detailed regulation plans, and local municipal development strategies which define the spatial and functional framework of the spa settlements. It also incorporates studies of areas with exceptional natural features, as well as development plans and strategies for spa development that outline current conditions and provide insight into the morphogenetic processes that occurred. Complementing these official sources are expert studies, previous research, and relevant literature documents, including monographs and scientific articles on spa morphology and the Pannonian Basin.

Map interpretation and comparative reading of these materials provide the methodological basis for tracing territory, spatial structures, functional zones, and landscape relations at multiple scales. In this regard, the study proceeds through a progressive reduction of scale, tracing how landscape conditions inform spatial structures from the territorial to the architectural level. Spa settlements thus emerge as morphological reflections of the landscapes that sustain them, at once therapeutic systems and heritage landscapes shaped by the instrumentalisation of natural resources and spatial structures.

4. THE PANONIAN BASIN - A MORPHOSTRUCTURAL COMPONENT OF VOJVODINA

The complex geotectonic structure of Serbia includes several morphotectonic units, among which the Pannonian Basin forms a distinctive and geologically autonomous depression in the northern part of the country (Stanković, 2009). Originating from the subsidence and rifting of the former Pannonian landmass, the basin was shaped by marine transgressions of the Tethys Ocean, which led to the formation of the Pannonian Sea, and subsequently the Pannonian Lake (Kazmer, 1990). As the waters gradually retreated, thick sedimentary layers of sand, clay, and loess were deposited, forming the present-day lowland landscape of Vojvodina. The basin is bounded by the Carpathians to the northeast, the Dinarides to the southwest, and the Alps to the west, a geomorphological frame that defines both its physical and ecological distinctiveness.

Water, as one of the fundamental natural resources, underlies the long tradition of spa culture in Serbia. More than 300 natural occurrences of mineral and thermal waters have been identified across the country, and when including exploratory and exploitation boreholes, the number exceeds one thousand (Filipović, 2003). The spatial distribution of these springs reflects complex geological, structural, and hydrogeological conditions. Based on these criteria, Serbia was divided into hydrogeological regions, with the Pannonian Basin region representing a distinct unit. This region largely coincides with the territory of Vojvodina and extends into parts of Hungary and Romania, where occurrences of mineral, thermal, and thermo-mineral waters, both naturally outflowing and artificially extracted, are numerous and diverse. Parallel to this hydrogeological regionalisation, the classification of spa zones within Serbia identified nine main spa regions: the Šumadija, West Morava, Kopaonik-Jastrebac, Novi Pazar-Priboj, South Morava, Carpatho-Balkan, Kolubara-Podrinje, Vojvodina, and Kosovo-Metohija zones (Marković, 1973). The Vojvodina spa zone, relevant for this research, thus provides both a spatial and conceptual framework for the analysis of spa landscapes in the Pannonian Basin. Within it, three regional subunits, Srem, Bačka, and Banat, encompass several historically and functionally recognised spa centres such as Slankamen and Vrdnik in Srem, Kanjiža and Junaković in Bačka, and Rusanda and Torda in Banat (Marković, 1973).

Vojvodina lies on thick sequences of Neogene and Quaternary sediments, composed predominantly of sand, clay, loess, and gravel, containing multi-layered aquifers (Marinković, Papić, Dragišić, & Andrijašević, 2016). These permeable strata enable the circulation and accumulation of groundwater,

creating favourable conditions for thermal and mineral water deposits. The geothermal springs and saline flats of Banat, the alluvial terraces of Bačka, and the slopes of Fruška Gora in Srem represent three principal morpho-structural types of the region's spa landscapes. The saline ecosystems of Banat, such as those around Rusanda, are of particular ecological and morphological relevance. These fragile systems illustrate the interplay between geology, hydrology, and vegetation in shaping the spatial and visual identity of spa landscapes. In contrast, Banja Slankamen, located on the slopes of Fruška Gora, represents a transitional morphology, a spa integrated into a hilly rural context with natural springs emerging along the loess terraces of the Danube valley. Banja Kanjiža, on the other hand, reflects the hydrogeological character of the northern Bačka plain, where deep artesian wells extract thermal waters from confined aquifers beneath the loess cover. Together, these three sites encapsulate the spatial variability and environmental typology of the Vojvodina spa landscape.

The Pannonian Basin in Serbia represents the lowest geomorphological section of the basin system and a distinctive lowland ecosystem. Its relief, shaped by long sedimentary and fluvial processes, provides a uniform but ecologically complex environment in which micro-landscapes emerge as unique spatial and ecological entities. These micro-landscapes - saline flats, loess plateaus, wetland margins, and gentle slopes- manifest the diversity of a seemingly homogeneous plain. The landscape structure in this context becomes the key to understanding spatial variation: the continuous sequence of landscape 'scenes' reflects the mosaic of the basin's ecological and morphological diversity. In contrast to the mountainous spa complexes of central and southern Serbia, where dramatic topography defines the architectural and urban morphology of spa settlements, the lowland landscape of Vojvodina introduces a different morphogenetic logic. Here, water bodies, lakes, rivers, and canals, vegetation patterns, forests, grasslands, wetlands, and the interplay of soil and microclimate form the principal shaping forces of spa settlements. The subtlety of relief requires that morphology be understood through horizontal spatial relationships, the alignment of built form, water systems, and vegetation in a continuous landscape matrix (Ćalić, Milošević, Gaudenyi, Štrbac, & Milivojević, 2012).

Figure 1. Illustrative map of the Pannonian basin, Source: Author

This understanding of the landscape–driven morphological approach should also be viewed within the broader framework of the spatial and cultural logic of Vojvodina, whose landscape has been shaped by a complex network of historical, hydrological, and agrarian structures. Urban development in Vojvodina, including spa settlements, has largely been determined by the geomorphological characteristics of the Pannonian Basin and the rational systems of planned construction that have evolved since the eighteenth century (Stevanović, 2009). These patterns produced a characteristic morphology, an orthogonal street grid, a clearly defined central area, and peripheral zones often connected to natural resources (Krunić, 2012). Within such spatial and organisational models, Vojvodina's spas emerged as a distinct type of settlement

that inherited the fundamental characteristics of the regional urban pattern but transformed them through the relationship with natural springs, parks, and recreational landscapes. The interaction between the planned urban grid and the naturally conditioned spa location forms the basis for understanding the morphology of spa landscapes in the regional context. Spatial patterns of Vojvodina's settlements reflect a rational and functional approach to space, yet also demonstrate adaptability to local landscape conditions, which is considered a crucial aspect for analysing spa territories as specific landscape units.

Positioning spa settlements within the broader spatial framework of Vojvodina thus allows their morphological structure to be interpreted not merely as a result of functional organisation or planning tradition, but as an expression of the region's distinctive landscape identity. This confirms that the analysis of spa morphology must integrate the regional spatial pattern, as it determines the ways in which the built environment and natural elements interact and are perceived as a unified landscape entity.

5. LANDSCAPE CHARACTERISATION

Within the seemingly uniform lowlands of the Pannonian Basin, Vojvodina encompasses a diverse range of landscapes, reflecting a complex spatial and ecological structure. Although the region is broadly defined by flat terrain, it is composed of loess plateaus, sandy plains, alluvial lowlands, and isolated hilly areas, each contributing to the distinctiveness of local environmental conditions. The division of Vojvodina into Banat, Bačka, and Srem highlights three principal landscape segments, which serve as representative units for understanding the variety of natural settings in which spa settlements have historically developed. These landscapes are further distinguished by soils, groundwater regimes, saline surfaces, vegetation communities, and microclimatic conditions, all of which influence the spatial distribution of flora and fauna and the ecological sensitivity of the region. Vojvodina hosts a network of natural parks, reserves and protected areas, reflecting the ecological importance and vulnerability of its landscapes. In this context, the characterisation of these landscapes in this study is based on three central aspects: relief, microclimate, and vegetation - providing a layered understanding of each region. By illustrating these features, the analysis conveys the structural and ecological diversity of Vojvodina's landscapes, providing a clear spatial context for a subsequent comprehensive assessment of the relationship between these landscape structures and spa settlement morphology.

The Banat landscape represents the flattest segment of the Pannonian Basin, characterised by minimal elevation differences and a gently articulated microrelief. The terrain is predominantly flat, with elevations generally ranging between 76 and 77 m above sea level, locally rising to approximately 82 m along loess terraces (Obradović, 2005). This area marks the contact zone between the alluvial plains of the Tisa and Danube rivers and the adjacent loess formations, resulting in subtle surface undulations rather than pronounced landforms. Although visually understated, this microtopography plays a decisive role in hydrological processes, enabling the retention of surface and groundwater within shallow depressions and thus providing the geomorphological basis for the development of saline soils, salt flats, and saline lakes. Banat encompasses nearly two-thirds of all saline and alkaline soils in Vojvodina, making it the core area of this landscape type within the Pannonian Basin (Miljković, 1965). Historically, the region was subject to repeated flooding associated with the wider Carpathian Basin, particularly through the dynamics of the Tisa and Danube river systems. Subsequent drainage and desiccation processes led to salt accumulation and soil alkalisation, especially within low-lying depressions. Variations in microrelief and groundwater depth produce spatially heterogeneous salinity patterns, resulting in fragmented yet clearly legible saline landscapes. Many saline lakes represent remnants of abandoned river meanders or shallow lacustrine depressions in which salts accumulated following water withdrawal (Miljković, 1965).

FIGURE 2. The saline-steppe landscape of Banat Source: Stojanovic (2016), Wikimedia Commons (CC BY-SA 4.0)

In the Middle Banat, saline landscapes spatially overlap with Pannonian steppe formations, forming a distinctive saline-steppe mosaic. Salt-affected depressions are closely juxtaposed with slightly elevated steppe surfaces, creating a fine-grained spatial pattern typical of this part of the Pannonian Basin. The regional climate is moderately continental, with cold winters and very warm summers. High summer evaporation frequently exceeds precipitation, intensifying salinisation processes (Gavrilov et al., 2020). The openness of the plain exposes the landscape to strong prevailing winds, while localised woodland belts and linear vegetation structures create microclimatic enclaves with reduced thermal extremes. Saline and alkaline soils support specific halophytic and steppe plant communities that contrast sharply with the surrounding agricultural landscape (Zeremski et al., 2021). Vegetation adapted to elevated salt concentrations forms distinctive assemblages, including saline grasslands and halophytic meadows, which appear as isolated or semi-continuous natural enclaves within the intensively cultivated lowland. These plant communities are important ecological indicators of saline environments and often include endemic or relict species characteristic of the Pannonian Basin. The resulting mosaic of vegetation types contributes significantly to the spatial heterogeneity, visual identity, and ecological specificity of the Banat saline-steppe landscape.

Along the course of the Tisa River, a landscape that geographically belongs to the Bačka region unfolds. It is predominantly a flat lowland area in northern Vojvodina, characterised by gentle elevation changes and subtle relief differences. Loess plateaus rise slightly above the surrounding floodplain, creating terraces and slopes that influence soil conditions and local topography. Along the river, natural backwaters and alluvial terraces form minor micro-relief features, providing spatial variety within the otherwise flat plain (Marković & Pavlović, 1995). These formations mark the interface between the river corridor and the broader lowland landscape.

Microclimatic conditions are shaped by the interaction of the river and open terrain. Tisa River contributes to localised humidity, forming cooler and more humid micro-zones along its banks and floodplains, especially during summer. Open plains allow unobstructed air circulation, which increases thermal amplitude compared to areas with vegetative cover. Tree belts along river channels and wetlands create small, sheltered microenvironments that moderate temperature extremes and retain moisture. The regional climate is moderately continental, with cold winters and warm to hot summers, and relatively low precipitation that often limits water availability (Radulović et al., 2021). Vegetation reflects this interplay of relief and climate. Floodplain forests

and marshes develop along the river and its side channels, with species adapted to periodic inundation and wet soils. On higher loess terraces and plateaus, steppe-like grasslands merge with cultivated areas, forming a landscape of natural and semi-natural vegetation. Steppe-like vegetation persists on higher loess terraces and drier areas, where well-drained soils and open exposure favour drought-tolerant grasses and herbaceous species (Jakovljević et al., 2020). Salt-tolerant and halophytic plant communities appear in localised depressions, contributing to the ecological diversity of the lowland. The spatial pattern of open grasslands, riverside wetlands, and scattered tree belts emphasises the diverse yet coherent character of the Bačka lowlands.

FIGURE 3. Source: Ivanavpopov (2023), Wikimedia Commons (CC BY-SA 4.0).

The southern landscape in Srem, along the Danube, represents a distinctive segment of Vojvodina, shaped by the intersection of the Pannonian lowland, the Danube, and the foothills of Fruška Gora. At the southern edge of the plain, the otherwise flat terrain acquires local variations due to the river corridor and the isolated relief of Fruška Gora. The landscape's relief is defined by a sequence of river islands - adas, alluvial plains, and terraces formed through long-term sediment deposition and water-level fluctuations (Tomić et al., 2020). A notable feature is the loess profile, consisting of wind-deposited sediments up to 800,000 years old, creating terraces and gentle slopes descending toward the Danube (Vasiljević et al., 2011). These formations produce a clear transition between the alluvial plain and Fruška Gora's foothills, where the terrain gradually rises, with increasing gradients and micro-relief closer to the mountain.

Microclimatic conditions are shaped by the Danube and the relief. The river increases local humidity and creates microclimatic zones along its banks, islands, and loess terraces, particularly in summer. Open lowland areas allow free air circulation and pronounced thermal amplitudes, while Fruška Gora's forested slopes moderate temperatures, retain moisture, and influence wind

patterns, producing contrasts between northern and southern exposures (Lazić, Savić, Tomić, 2006). Vegetation reflects this relief and climate. Fruška Gora features a heterogeneous forest-shrub mosaic dominated by oak, hornbeam, and mixed forests, while lower zones include meadows and open areas (DEIMS-SDR, 2025). Along the Danube and its islands, fluvial vegetation adapts to periodic flooding. Loess terraces and slopes with fertile soils support diverse plant communities and historically cultivated landscapes, such as vineyards and orchards. Overall, southern Srem forms a layered landscape structure where relief, microclimate, and vegetation intersect, creating a visually and ecologically distinct environment.

FIGURE 4. Source: Jankovic Faza Dragan (2012), Wikimedia Commons (CC BY-SA 3.0).

6. SPATIAL AND MORPHOLOGICAL ANALYSIS OF SPA SETTLEMENTS

6.1 Banja Rusanda

Banja Rusanda is a specialised rehabilitation spa located in the central Banat region, on the northern shore of Lake Rusanda, in the settlement of Melenci within the Zrenjanin municipality. It lies in the fertile Pannonian Basin at a low elevation of 82 m above sea level. The spa is particularly significant in the Serbian and Vojvodina spa system, as it is the only active therapeutic facility in Banat. Banja Rusanda was established in 1878 and has a long tradition of therapeutic use based on the medicinal properties of mineral peloids - mud from Lake Rusanda, considered among the most healing in the country. Lake Rusanda is a remnant of the former extensive Pannonian Sea; its bottom is covered with predominantly inorganic mud, and its water is saline and alkaline, resembling seawater. Lake functions as the primary balneological resource, together with a borehole of thermo-mineral water located in the immediate vicinity of the spa core (Obradović, 2005)

I - Territorial and Spatial Context

Banja Rusanda is situated on the northern shore of Lake Rusanda, at the western edge of the settlement of Melenci, within the central Banat landscape. Spatially, the spa occupies a transitional zone between the built fabric of the settlement and the open saline lowland, forming a clearly legible interface between urbanised and natural space. Its position reflects the broader geomorphological setting of Banat, characterised by the contact between the alluvial plain of the former Tisa river system (76–77 m a.s.l.) and slightly elevated loess terraces, on which the spa complex is located at approximately 82 m a.s.l. This subtle elevation difference provides comparatively better drainage conditions and has historically defined the location of both the settlement and the spa. The spa is well connected to the regional network via the main road linking Zrenjanin (17 km) with Kikinda (39 km), as well as to Pančevo and Belgrade (approximately 90 km to the south). The Pančevo–Zrenjanin–Kikinda railway line passes through Melenci, while the Danube–Tisa–Danube (DTD) canal runs through the wider cadastral area, reinforcing the role of the settlement within the hydro-engineered landscape of Banat. Despite this infrastructural connectivity, the spa itself remains spatially distinct from traffic corridors, embedded within a continuous green and open landscape structure.

Lake Rusanda, located immediately south of the spa complex, is a shallow saline lake with a surface area of approximately 4 km² and depths ranging between 0.5 and 1.5 m. It represents an abandoned meander of the former Tisa River, within which saline and alkaline conditions developed due to long-term water retention, evaporation, and sedimentation processes. The lake and its surrounding saline depressions form the core natural framework of the spa's territory. A second former meander, Lake Ostrovo, located about 4 km north of Melenci, further confirms the dominance of fluvial relics and engineered hydrological systems in shaping the wider landscape context.

It is encompassed by spatial planning documents addressing the saline landscapes of central Banat, including the protected natural areas of Okanj Bara and the Slatine srednjeg Banata, while Lake Rusanda itself has been designated as a nature park. These overlapping regimes of protection establish clear constraints on land use, construction intensity, and spatial expansion, reinforcing the preservation of open saline surfaces, water bodies, and natural vegetation. As a result, the territorial context of Banja Rusanda is defined not only by its physical position but also by a multi-layered system of environmental regulation that directly conditions its spatial form and limits its morphological transformation.

FIGURE 5. Analytical map of Banja Rusanda - Spatial and morphological analysis, Source: Author

II - Structure and Morphology

The internal structure of Banja Rusanda is characterised by a dispersed, pavilion-based layout embedded within a large landscaped park. The spa complex occupies an extensive, open spatial unit at the northwestern edge of Melenci, clearly separated from dense residential development. Its morphology reflects a low-density, horizontal organisation, with built volumes distributed across a cultivated green matrix rather than concentrated into a compact core. The central functional nucleus of the spa is formed by several primary buildings positioned closest to Lake Rusanda, establishing a direct spatial relationship with the primary natural resource. Secondary pavilion structures

complement these central volumes arranged laterally and toward the rear of the complex, creating a loose hierarchical composition. The pavilion typology, combined with modest building heights and fragmented footprints, produces a porous spatial structure in which open spaces, paths, and vegetation play an organising role equal to that of the buildings themselves. Circulation within the spa is organised through a network of internal pedestrian paths that connect the pavilions and central facilities, forming a clearly defined internal system largely independent from the surrounding settlement. Access to the complex is oriented from the landward side, through landscaped green areas, reinforcing the perception of the spa as an inward-oriented spatial entity. The absence of dominant axial compositions or monumental built forms further emphasises the primacy of the park as the core spatial framework.

From a morphological perspective, the spa does not rely on relief articulation or built density to define its structure. Instead, spatial order is achieved through the distribution of built volumes within a continuous green field, supported by high and low vegetation layers. The flat terrain and lack of pronounced topographical features result in a morphology that is predominantly horizontal and visually open, with long sightlines and gradual transitions between built and unbuilt areas. This configuration establishes the spa as a spatially extensive but formally restrained ensemble, whose structure is inseparable from its landscaped setting.

III – Relation to landscape structure

Banja Rusanda is spatially positioned at the contact zone between the alluvial plain of the Tisa River and a slightly elevated loess terrace, which provides a stable and well-drained base for development while maintaining immediate proximity to Lake Rusanda as the primary natural resource. This minimal but decisive elevation difference structures the relationship between the spa complex and the surrounding saline landscape, allowing the built fabric to remain outside the most sensitive depressions associated with saline soils and fluctuating water levels.

The lake functions as a dominant organising element, not through direct construction along the shoreline, but through orientation, distance, and spatial sequencing. The main pavilions are arranged predominantly parallel to the lake, forming a linear frontage that visually addresses the water while maintaining a green buffer zone between the buildings and the shoreline. Pedestrian access to the lake is enabled through landscaped open spaces and designated paths, including docks, ensuring controlled contact rather than continuous occupation of the waterfront.

Given the absence of pronounced relief, vegetation plays a critical structuring role. The park and forest belt surrounding the spa were established as a protective and spatially formative layer, mitigating wind exposure and thermal extremes typical of the open Pannonian Basin. Vegetation thus replaces topography as the primary means of spatial articulation, defining movement, enclosure, and visual continuity. While the broader saline-steppe landscape remains largely beyond direct visual reach, the spa maintains a clear and consistent relationship with the lake, integrating the therapeutic landscape into its internal spatial logic without disrupting the ecological integrity of the surrounding saline environment.

6.2 Banja Kanjiža

Banja Kanjiža is located in the northern Bačka region of Vojvodina, on the fertile Pannonian Basin along the Tisa River, within Kanjiža municipality, at an elevation of 86m above sea level. It has operated as an independent balenological centre since 1976, while being established during the 19th century. The spa primarily exploits three artesian horizons, accessed through hydrogeological boreholes, which provide the thermo-mineral water used for therapeutic purposes, while this infrastructure also supports local communal and urban energy use (Stanković, 2009).

I - Territorial and Spatial Context

Banja Kanjiža is located on the southeastern periphery of the settlement of Kanjiža, in the northern Bačka region, on the flat alluvial plain of the Tisa River at 86 m a.s.l. The spa occupies a transitional zone between the built urban fabric and open lowland terrain, maintaining accessibility to the settlement while remaining closely integrated with surrounding natural and semi-natural areas. Its territorial logic reflects the lowland spa typology of Vojvodina, where complexes are established at settlement margins, balancing infrastructural access and environmental integration.

The wider territorial context of the spa is strongly defined by hydrological and ecological structures. Although the compact spa core is relatively limited in size, the functional territory of Banja Kanjiža extends far beyond its immediate built area through a dispersed system of hydrogeological boreholes and their associated sanitary protection zones. One of the key water sources used for balneological purposes is located within the, ecologically significant, area of outstanding landscape features Kanjiški jaraši which contains habitats of nationally protected species. In addition, the territory of the municipality includes two internationally significant ecological corridors, the Tisa and

the Kereš, which intersect with zones relevant to the spa's water resources. These overlapping natural and regulatory structures impose spatial constraints, shaping a territorial framework where land-use, vegetation, and construction intensity are regulated to preserve water quality and ecological continuity.

II - Structure and Morphology

The spa core exhibits a compact, centralised morphology. The primary spa and accommodation building concentrates the main therapeutic and lodging functions, while several smaller structures, including historically protected buildings, complement the ensemble. Unlike pavilion-based spa types, Kanjiža's morphology is characterised by aggregation rather than dispersion, forming a coherent complex oriented toward the adjacent Narodni Park.

The park functions as an integral spatial element, mediating between the built core and the surrounding landscape. Its pedestrian paths, tree-lined areas, and open spaces establish continuity with the wider lowland terrain, while allowing gradual spatial transitions from the urban settlement to natural areas. Original spa structures are directly integrated with the park, while newer buildings extend the core southeastward, creating a coherent ensemble that respects both urban adjacency and environmental integration. The horizontal and low-rise character of the complex maintains openness and visual permeability, aligning morphology with the flat, open context of the Bačka plain.

III – Relation to landscape structure

Banja Kanjiža's spa core is positioned on the southeastern periphery of the settlement, oriented toward the Narodni Park, which functions as the primary spatial framework connecting the built environment to the surrounding lowland landscape. The compact arrangement of buildings establishes a controlled interface between the urban fabric and open terrain, while the park mediates spatial continuity and provides a soft transition to the broader Pannonian Basin. The spa's functional territory extends well beyond the built core, encompassing dispersed hydrogeological boreholes, sanitary protection zones, and associated infrastructural elements. Some of these zones reach up to the Tisa River embankment upstream and include point-like features scattered across the municipality, overlapping with ecologically protected areas. This distribution illustrates a spatial logic in which the therapeutic landscape integrates with regulatory and ecological frameworks, ensuring water protection and ecological continuity without necessitating dense or visually dominant construction.

Vegetation and park elements play a central morphogenetic role in structuring space. Tree-lined pathways, open recreational areas, and green buffers articulate movement and enclosure, compensating for the flat and visually homogeneous terrain. The resulting morphology is horizontal and moderately permeable, with the spa's built volume subordinated to the ecological and hydrological logic of the surrounding landscape. Consequently, Banja Kanjiža demonstrates a spatial configuration in which morphology is largely shaped by lowland fluvial and regulatory constraints, rather than by topographical relief or monumental form.

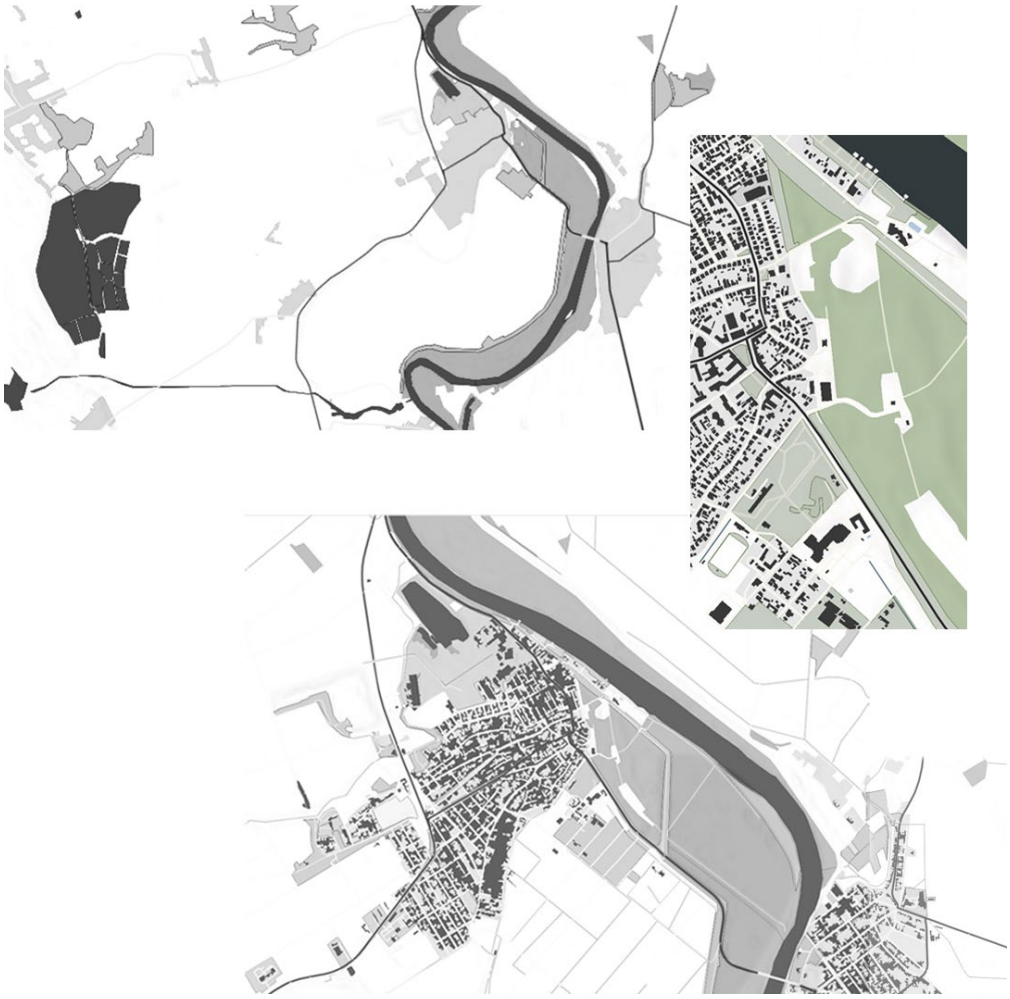

FIGURE 6. Analytical map of Banja Kanjiza - Spatial and morphological analysis.
Source: Author

6.3 Banja Stari Slankamen

Stari Slankamen is the oldest spa in Vojvodina and one of the earliest natural healing sites in Serbia. It is located at the easternmost edge of Fruška Gora, on the right bank of the Danube, where mineral springs emerge beneath the loess escarpment at an elevation of approximately 80 m above sea level. The spa is situated within the rural landscape of Stari Slankamen, combining natural hydrogeological features with the historic character of the village. The modern spa was established in 1906, building upon a long tradition of using the local mineral springs for therapeutic purposes. The therapeutic use of saline mineral water in this area dates back to the Ottoman period, when a bathing site existed at the springs, later followed by water extraction from shallow wells. These springs emerge naturally through artesian processes, providing saline and relatively warm water suitable for health and wellness treatments.

I - Territorial and Spatial Context

Stari Slankamen is positioned in southeastern Srem, Vojvodina, 55 km from Belgrade and in close proximity to Novi Sad. The historic and cultural town of Sremski Karlovci lies 20 km upstream, offering cultural and spiritual landmarks such as the oldest Serbian library and seminary, baroque architecture, churches, and museums. The spa is integrated into a broader landscape shaped by the Danube and Tisa rivers, which define the hydrological and ecological corridors of the region. Several riverine islands (adas) and protected riverbanks form part of the ecologically sensitive zones near the spa. The area is also adjacent to Fruška Gora National Park, with forested slopes contributing to biodiversity, recreation, and microclimatic regulation. The location has been identified in regional nautical tourism development plans as a primary site for marinas along the Danube, reflecting its strategic position at the confluence of major river corridors and its accessibility from surrounding urban centres.

II - Structure and Morphology

The settlement of Stari Slankamen is organised into two main spatial and functional units: the upper part, consisting of the historic residential core with the church, houses, and central square dating from the 9th century, and the lower part, occupied by the spa and medical complex, which extends along the riverbank. The spa complex includes the early 20th-century bathhouse, now functioning as a specialised hospital, patient pavilions arranged in a pavilion-type layout oriented toward the river, an outpatient facility for daytime therapies, accommodation units, rehabilitation spaces for hydrotherapy and physiotherapy, and supporting amenities. This arrangement allows patients

and visitors to combine treatment with leisure within a carefully structured environment. The spa core is subtly nestled within the settlement, not directly accessible from the main roads connecting larger towns. A park and green corridors along the river organise the space between buildings, while the main hospital building has been modernised in the early 21st century. The approach road connects the upper residential area with the spa, reinforcing the vertical hierarchy imposed by the relief. The spatial organisation emphasises the relationship between the settlement, the spa, and the river, highlighting the artesian spring as a defining element of both structure and experience.

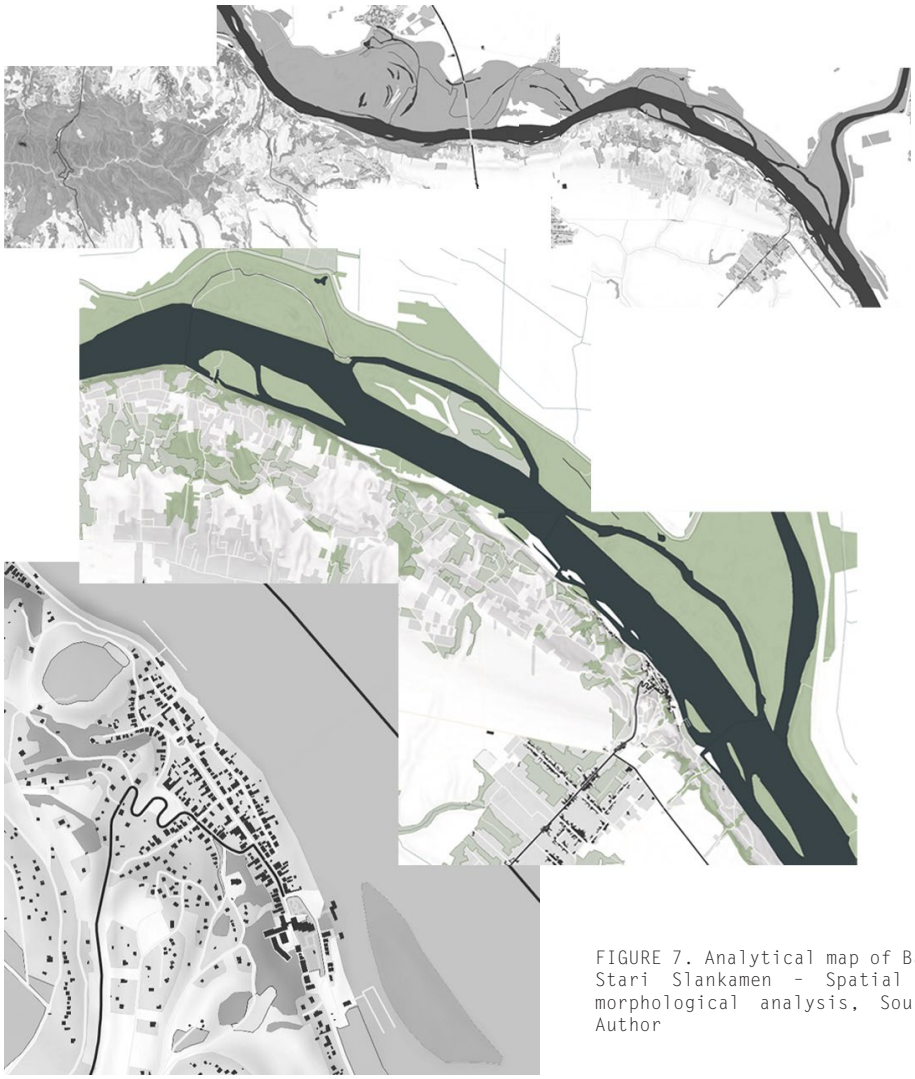

FIGURE 7. Analytical map of Banja Stari Slankamen - Spatial and morphological analysis, Source: Author

III – Relation to landscape structure

The Stari Slankamen spa complex occupies a spatial niche in the eastern and lower part of the settlement, developing along the slope in accordance with the relief. Positioned on the steep right bank of the Danube, the artesian mineral springs at the riverside have determined both the development and the linear morphology of the spa. The spa's position on the steep Danube terrace, close to the confluence with the Tisa River, establishes its primary spatial and visual axis, integrating the watercourses into the overall organisation. The surrounding landscape includes forested complexes on the Fruška Gora slopes, natural vegetation belts changing with slope and aspect, and protected areas such as the Fruška Gora National Park and river islands under environmental protection. The proximity to the Danube and Tisa, together with terraced relief and vegetation, creates a distinct microclimate characterised by moderated temperature fluctuations, increased humidity along the riverbank, and local wind patterns shaped by the river.

The spa's morphology, elongated along the river, interacts with this landscape structure, combining natural and recreational spaces. Green corridors and the park mediate between built structures and the river, while the vertical hierarchy emphasises visual connections between the upper settlement, the spa complex, and the surrounding water and relief features. This integration of natural springs, rivers, relief, and vegetation defines the spa's spatial logic and reinforces its role as a landscape-based therapeutic environment.

7. COMPARATIVE ANALYSIS AND DISCUSSION

Although Rusanda, Kanjiža, and Stari Slankamen are all situated within the Pannonian Basin, each occupies a distinct landscape context that shapes its spatial morphology and relationship to the environment. Srem, where Stari Slankamen is located, combines the influence of rivers with upland relief, generating varied microclimates, forest-meadow mosaics, and floodplain dynamics. Banat, the context for Rusanda, features saline depressions interspersed with steppe-like terrain, where soil salinity and high summer evaporation dictate vegetation patterns and open landscape character. Northern Bačka, home to Kanjiža, is largely flat, with deep artesian systems underlying the surface, simplified hydrology, and floodplain vegetation along major river corridors. Despite these differences, all three regions reveal layered interactions among landforms, water, and vegetation communities, providing a comparative framework for exploring how landscape conditions inform spa settlement morphology.

The nature of the spa water source directly informs the spatial positioning and organisation of each settlement. At Rusanda, the saline lake functions as an extended hydrological and ecological anchor, with the spa complex adapting to a closed, self-contained ecosystem. In Kanjiža, the deep artesian wells offer flexibility in surface placement, allowing the spa to integrate with the surrounding settlement without being constrained by topography. By contrast, Stari Slankamen is closely tied to artesian springs emerging on loess terraces, with sloping terrain towards the Danube directly influencing the linear arrangement of buildings, the vertical hierarchy of spaces, and the relationship between settlement and riverfront. These variations demonstrate how water source characteristics, together with topography, establish distinct spatial frameworks that guide the morphology of spa settlements.

Access and connectivity further shape the scale and form of each spa. Kanjiža benefits from proximity to larger urban centres, with infrastructure enabling integration with surrounding settlements, while the linear, terraced form of Stari Slankamen constrains circulation and centralises functions along a descending slope. Rusanda's enclosed landscape creates an internally coherent spatial order, with buildings oriented around the water body, enhancing the perception of a contained therapeutic environment. In each case, transport links, corridor positioning, and access to natural features influence the organisation of functional zones, hierarchy of open spaces, and visitor experience, demonstrating that landscape and human infrastructure operate jointly to structure spa settlements. Climatic factors act as additional

determinants. The location of Stari Slankamen along the Danube and Tisa rivers modifies the local microclimate, with moderated temperature ranges, increased humidity near water bodies, and wind patterns shaped by relief and river corridors. Rusanda's saline depressions create distinct thermal and evaporative conditions, reinforcing its closed ecosystem character. Kanjiža, with its artesian wells and flat terrain, allows for the exploitation of microclimatic conditions in spa programming without significant topographical constraints. These differences illustrate how climate interacts with hydrology and relief to influence both the siting of spas and their functional and spatial organisation, aligning with the hypothesis that local environmental conditions generate distinct morphological expressions.

The three case studies collectively demonstrate that landscape structure actively conditions the spatial identity and internal organisation of spa settlements, supporting the research's first hypothesis. Morphology, in turn, interprets and adapts to these conditions, articulating the interface between natural systems and human intervention. Each spa settlement functions as a mediator between landscape and architecture, translating relief, hydrology, vegetation, and microclimate into spatial form, functional zoning, and visual hierarchy. Subtle differences in environmental context, even within the seemingly homogeneous Pannonian lowlands, produce discernible variations in spatial arrangement, building orientation, and integration with the surrounding landscape, confirming the third hypothesis regarding the influence of localised conditions.

FIGURE 8. Comparative view of spa settlements, Source: Author

By integrating comparative insights across relief, water, vegetation, access, and microclimate, the analysis confirms that spa settlements cannot be understood solely as architectural artefacts; they are spatially and ecologically embedded systems. This study highlights how natural resources, topography, and hydrological characteristics inform spatial hierarchy, functional zoning, and human experience, while also accounting for cultural and infrastructural factors that mediate landscape interaction. The findings demonstrate that spa morphology is both a response to and a reflection of landscape logic, supporting sustainable planning approaches that consider ecological processes, heritage, and human use as intertwined determinants of spatial form.

8. CONCLUSIONS

In conclusion, this study demonstrates that spa settlements are inseparable from their landscape context, where natural structure operates as a generative framework rather than a deterministic background. By examining Rusanda, Kanjiža, and Stari Slankamen, this research demonstrates that landscape structure shapes the range of possible spatial configurations, guiding the positioning, hierarchy, and organisation of built form while allowing for human agency and adaptation. The research confirms that differences in relief, hydrology, vegetation, and microclimate produce distinctive morphological expressions, highlighting how local environmental conditions inform spatial identity. In addressing the research hypotheses and objectives, the study illustrates that spa morphology reflects a layered interaction between natural systems and human intervention, revealing the settlement as a spatial mediator between ecological and cultural processes. The broader contribution lies in demonstrating the analytical and conceptual value of landscape structure for architectural and urban studies: understanding pre-existing natural frameworks allows designers and planners to interpret, integrate, and enhance spatial form in ways that respect both ecological processes and cultural heritage. This study attempts to provide a methodological framework applicable to various architectural typologies and landscape contexts, offering a methodological approach for linking landscape structure with morphology, informing sustainable planning, and expanding architectural and urban discourse on the interrelation between nature and built space.

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TOWARDS A RESTORATIVE DESIGN FRAMEWORK: INTEGRATING ENVIRONMENTAL SENSITIVITY AND HERITAGE CONTEXT IN SPA SETTLEMENTS

ABSTRACT

This paper proposes a restorative design framework for spa settlements by integrating environmental sensitivity, heritage context, and multisensory experience. Building on an interdisciplinary state-of-the-art review and the pedagogical platform of the SPATTERN project at the University of Belgrade – Faculty of Architecture, the study examines six design proposals developed across three master-level studios: Multisensory Architecture, Heritage Reprogramming, and Hybrid Naturalities. The research employs a dual methodological structure: (1) Design Stream 1, which generates three thematic restorative proposals for Radaljska Banja, Banja Koviljača, and Vranjska Banja; and (2) Design Stream 2, which applies three disciplinary approaches to a single case study - Niška Banja. Cross-case comparison reveals recurring restorative mechanisms (linear experiential routes, heritage reactivation sequences, and eco-hydrological integrations) while also highlighting how different disciplinary lenses generate distinct trajectories of restoration. Three overarching restorative scenarios emerge: sensory–atmospheric restoration, heritage continuity and adaptive memory, and eco-cultural regeneration. The findings demonstrate that spa settlements possess unique spatial, ecological, and cultural conditions that can be strategically leveraged through restorative design.

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KEY WORDS
RESTORATIVE DESIGN
ENVIRONMENTAL SENSITIVITY
HERITAGE REPROGRAMMING
MULTISENSORY ARCHITECTURE
HYBRID ECOLOGIES
ADAPTIVE REUSE
THERAPEUTIC LANDSCAPES

1. INTRODUCTION

1.1. Notion of Spascapes – Spa Settlements Challenges

Spa settlements represent one of Europe's most historically layered and morphologically distinctive urban environments, shaped through centuries of interaction between hydrothermal resources, therapeutic practices, landscape infrastructures, and evolving socio-cultural imaginaries. Far from being local curiosities, these settlements formed a transnational urban system whose influence exceeded their geographical scale and positioned them as significant stages of European sociability, architectural experimentation, and health culture. Research over the last two decades consistently demonstrates that spa settlements constitute a recognizable and comparative urban phenomenon - what could be framed as *spascapes* (Milovanović et al, 2025), spatial frameworks in which natural, architectural, and socio-therapeutic landscapes operate as an integrated whole.

Urban-historical studies situate spa settlements within a broader European trajectory of urban formation, emphasizing their role as early prototypes of leisure urbanism and cosmopolitan exchange. Syntheses of the UNESCO *Great Spa Towns of Europe* serial nomination establish spa towns as a coherent typology defined by the intertwining of therapeutic landscapes, green and blue infrastructures, and purpose-built public architecture (Kuča, 2022; UNESCO, 2021). This perspective aligns with earlier historical analyses that identified spa towns, such as Bath, as engines of 18th-century urban renaissance, where the built fabric (assembly rooms, crescents, colonnades) served as a physical apparatus for new forms of polite sociability and performative urban life (Borsay, 2016; Frost & Laing, 2016). Transnational cultural histories further highlight the mobility of architectural ideas across spa settlements, framing them as nodes of European exchange, where elites circulated, and where urban and architectural models migrated across national boundaries (Steward, 2015; Zeman, 2012).

Despite their cultural and architectural significance, spa settlements today face a set of complex challenges that arise from demographic shifts, economic restructuring, climate change, and heritage management pressures. Research on adaptive reuse identifies the growing difficulty of maintaining oversized thermal infrastructures built for historical treatment regimes whose

contemporary relevance is diminishing (Fabi, Vettori & Faroldi, 2021). Post-socialist transformations in Central and Eastern Europe introduced additional ruptures, as socialist-era expansions often conflicted with 19th-century urban fabrics. The result is a fragmented urban landscape where abandoned facilities, underutilized heritage complexes, and mismatched infrastructural layers coexist, complicating efforts toward sustainable development and identity preservation. Moreover, environmental and climate-related challenges are becoming especially urgent. Recent studies emphasize that spa settlements, dependent on specific hydrothermal conditions, are highly vulnerable to aquifer shifts, environmental stress, flooding, and changing hydrological regimes (Golędzinowska & Ganczarek, 2025). Landscape-based research points to the degradation of blue-green networks that historically structured the therapeutic experience, arguing for reintegration of forest paths, waterways, and ecological corridors as key to contemporary revitalization (Ványolós, 2025; Leca, 2025). Technical heritage research further underscores the fragility of historic masonry and interior microclimates in bathhouses, calling for continuous monitoring and conservation strategies adapted to new thermal realities (Gutierrez-Carrillo et al., 2021; Popovska-Vasilevska & Armenski, 2015).

Parallel to environmental and physical challenges, spa settlements are undergoing profound socio-economic transformations. The shift from subsidized medical tourism to global wellness and lifestyle tourism has altered patterns of demand, reshaped urban economies, and intensified pressures on local communities (Steward, 2012). Market segmentation studies reveal increasingly diverse visitor profiles - ranging from "healing-motivated" to leisure-seeking users - each with distinct spatial expectations and potential conflicts (Dryglas & Salamaga, 2017; Smith & Puczkó, 2014). Geographic analyses further show that many spa settlements exhibit "shrinking city" characteristics, where the decline of traditional treatment industries destabilizes urban services and accelerates depopulation (Weidinger & Kordel, 2015). Against this backdrop, spa settlements emerge as laboratories of contemporary urban and environmental challenges, where heritage conservation, climate adaptation, socio-economic restructuring, and restorative design imperatives intersect. The concept of *spascapes* offers a holistic lens through which these challenges can be understood - not as isolated heritage problems, but as multi-scale, landscape-embedded phenomena that require integrated and sensitive design frameworks. This study positions itself within this interdisciplinary landscape, arguing that the future of spa towns depends on the development of restorative design strategies capable of reconciling ecological sensitivity, heritage value, and contemporary social needs.

1.2 Restorative Design Strategies – State of the Art

Contemporary discourse on sustainable architecture and landscape-oriented urbanism increasingly converges toward the concept of restorative design, a paradigm that integrates ecological sensitivity, circularity, human well-being, and heritage-conscious intervention. Across a wide body of recent literature, restorative design is framed as a corrective shift from extractive, growth-driven models of urban development toward design practices that regenerate ecosystems, valorize existing built fabric, and enhance multisensory and psychological well-being. Such perspectives hold particular potential for spa settlements - *spascapes* -whose historical identity is deeply rooted in the interplay between natural resources, therapeutic landscapes, and culturally layered environments.

The rise of restorative strategies across architectural and planning research highlights several converging themes. First, restorative environmental design (RED) has evolved as a conceptual and methodological framework focused on mental restoration, ecological renewal, and multisensorial experience (Hartig, Bringslimark & Patil, 2008). Applications in coastal landscapes demonstrate how design can orchestrate zoning for recovery, nature-based solutions, and sustainable resource management while enhancing human well-being (Kirana & Sunarya, 2024). In parallel, studies in educational, workplace, and children's environments demonstrate how spatial features - materiality, greenery, permeability, sensory gradients - produce measurable psychological restorative effects (Weber & Trojan, 2018). These insights offer direct relevance for spa settlements, historically conceived as environments for physical and mental cure, yet now challenged to reinterpret this curative ethos for contemporary needs.

A second major trajectory concerns adaptability, deconstruction, and no-demolish design, central to prolonging building life cycles and minimizing resource depletion. Systematic reviews and industry guidelines propose design-for-adaptability (DfA) (Askar, Bragança & Gervásio, 2022) and design-for-deconstruction (DfD) (Kanters, 2018) strategies such as modular assemblies, reversible joints, traceable materials, and flexible structural grids. Architectural manifestos emphasizing "restraint"- choosing not to demolish, transforming instead of replacing- have reframed no-demolish practice as a radical yet pragmatic tool for urban sustainability (ArchDaily, 2025). Historic spa settlements, characterized by oversized thermal complexes, underused bathhouses, and vulnerable masonry, stand to benefit considerably from such approaches, which preserve heritage value while enabling new adaptive programs.

The third line of research emphasizes circular economy strategies in the construction and renovation sectors, where principles such as reduce, repair, reuse, refurbish, remanufacture, and recover form the backbone of long-term ecological and material stewardship. Systematic reviews reveal persistent barriers - technical, financial, regulatory - yet also outline successful models for embedding reuse into architectural practice (Bellini et al., 2024; Dragonetti et al, 2025). Research on alternative recovery strategies further differentiates when to prioritize direct reuse, cascading flows, or relinking, stressing the importance of design foresight and "design for X" methodologies (Franconi et al, 2023). For spa settlements with constrained resources and extensive heritage infrastructure, such circular approaches provide actionable methods for transforming abandoned or oversized facilities without erasing historical layers.

A fourth cluster relates to regenerative and biophilic design, positioning the built environment as an agent of ecological renewal rather than mere environmental mitigation. Regenerative frameworks argue for net-positive outcomes - restoring ecosystems, rewilding consciousness, and creating buildings that contribute ecological value. Biophilic and restorative architecture studies emphasize psychological and physiological benefits derived from sensory richness, natural materials, and ecological interfaces (Nota et al., 2017). These insights resonate strongly with the original ethos of spa settlements, whose curative landscapes historically integrated forests, promenades, watercourses, and climatic therapies to create a holistic healing environment. As *spascapes*, these settlements naturally lend themselves to regenerative design approaches that enhance ecological performance while reinforcing therapeutic identity. Finally, cross-cutting literature highlights vernacular knowledge, traditional construction, and low-impact cultural practices as valuable precedents for restorative strategies. Systematic studies on vernacular architecture demonstrate how climate responsiveness, passive systems, and material circularity are embedded in traditional built environments (Zong et al, 2024). Translating these principles into contemporary spa settlements offers opportunities to align restorative design with local identity and culturally embedded understandings of environmental stewardship.

Taken together, these diverse strands of research establish restorative design as a multi-dimensional, integrative framework capable of addressing the intertwined challenges of heritage preservation, environmental vulnerability, socio-cultural transformation, and well-being enhancement in spa settlements. The potential for *spascapes* lies precisely in their inherent hybridity: they are simultaneously ecological systems, therapeutic environments, architectural

ensembles, and cultural landscapes. Restorative design strategies offer a conceptual bridge capable of reconnecting these dimensions, guiding interventions that work *with* existing resources - natural, architectural, and cultural - rather than against them.

2. MATERIALS AND METHODS

2.1. Research Context

The research draws on three master-level design studios at the University of Belgrade – Faculty of Architecture, conducted within the SPATTERN pedagogical framework. Multisensory Architecture (1st semester, 1st year) examines the sensorial and phenomenological dimensions of space through multisensory mapping, experiential diagramming, and environmental prototyping, positioning spa settlements as inherently multisensory environments shaped by water, vegetation, microclimate, and therapeutic infrastructures. Heritage Reprogramming (2nd semester, 1st year) focuses on adaptive reuse and restorative transformation of cultural heritage, addressing bath complexes, underused public buildings, and obsolete treatment facilities as opportunities for contemporary restorative agendas. The diploma-level studio Hybrid Naturalities (2nd year) integrates ecological systems, landscape infrastructures, and architectural interventions across scales, analyzing hydrothermal ecologies, forest paths, climatic gradients, and blue–green networks as foundations for regenerative spatial strategies in spa settlements.

In terms of course structure, the Multisensory Architecture and Heritage Reprogramming studios are offered in a combined studio-and-seminar format, carrying 15 ECTS (studio) + 2 ECTS (seminar). These formats support iterative analytical and design processes, enabling students to generate research-based design insights that directly feed into the methodological scope of this study. By contrast, the Hybrid Naturalities diploma studio is part of the final master-level academic module, comprising the thematic research phase, master thesis, master project, processfolio, and final design presentation, collectively carrying 30 ECTS. This expanded format provides a comprehensive platform for developing advanced, research-driven design proposals that integrate analytical rigour, contextual understanding, and restorative design strategies. Together, these three pedagogical settings form a multi-scalar and multi-method research environment in which spa settlements serve as case studies for investigating restorative design potentials. The diversity of methodological approaches, ranging from multisensory analysis to heritage reactivation

and ecological infrastructure design, provides a rich empirical basis for the analytical and design phases presented in the following sections.

Studio / Academic Level	Thematic Focus	Individual Case Study	Shared Case Study	Analytical Contribution
Multisensory Architecture	Sensorial and phenomenological spatial experience	Radaljska Banja	Niška Banja	Multisensory mapping, atmospheric analysis
Heritage Reprogramming	Adaptive reuse, heritage activation, no-demolish strategies	Banja Koviljača	Niška Banja	Heritage typologies, reprogramming potentials
Hybrid Infrastructures	Ecological systems, hybrid landscapes, blue–green networks	Vranjska Banja	Niška Banja	Territorial ecologies, hydrothermal networks

TABLE 1. Overview of Case Studies Across the Three Studios

2.2. Analytical Phase

The analytical phase of the research consists of two methodological components: (1) the selection of case studies, and (2) the spatial analysis of the selected spa settlements. These steps were jointly developed across three design studios participating in the SPATTERN pedagogical framework. Case selection followed a dual logic aligned with the structure of the studios: (1) the first design stream - assigns a different spa settlement to each studio, ensuring that analytical outputs emerge from the specific thematic lens of each course, and (2) the second design stream - employs a single shared case study for all studios, enabling methodological alignment and the development of a unified restorative design framework. Selected spa settlements (Table 1) represent different morphological conditions, hydrothermal resources, landscape typologies, heritage structures, environmental pressures, and development trajectories - providing a diversified empirical basis for the analytical phase (Figure 1).

2.3. Design Phase

The Design Phase translates the analytical findings into spatial, programmatic, and ecological design strategies applicable to spa settlements. Building on the diagnostic insights developed for each case study, this phase operationalizes the principles of restorative design - adaptability, ecological sensitivity, multisensory experience, and heritage-responsive transformation - to articulate a set of design propositions that address both the specific conditions of individual settlements and the broader logic of *spascapes*.

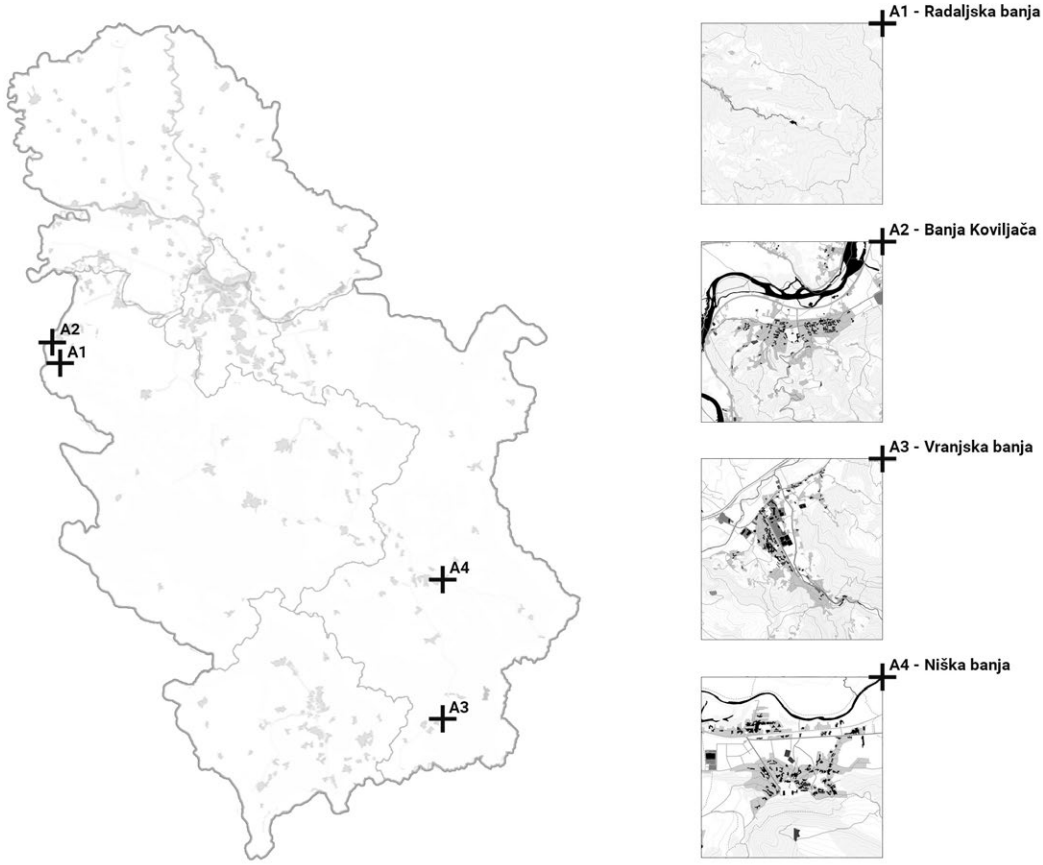

FIGURE 1. The Selected Case studies. Source: Authors

The design process is structured in two complementary streams. The first stream comprises studio-specific design development, in which each studio applies restorative principles to its assigned case study. This approach yields three distinct yet thematically aligned design outcomes: multisensory spatial intervention in Radaljska Banja, heritage reactivation strategy in Banja Koviljača, and ecological–infrastructural hybrid models in Vranjska Banja. The second stream represents a cross-studio integrative design process, wherein all three studios engage with Niška Banja as a shared case. This shared framework ensures methodological coherence and enables the synthesis of comparative design insights across scales, themes, and disciplinary approaches. Across both streams, the design methodology advances through three iterative components: (1) the definition of Restorative Spatial Strategies grounded in ecological recovery, heritage activation, multisensory enhancement, and landscape regeneration, (2) the articulation of Operational Design Principles,

detailing how such strategies translate into spatial organization, programmatic transformation, heritage-sensitive interventions, and environmental performance, and (3) the development of Design Prototypes, expressed through diagrams, spatial models, and interventions that visualize restorative potentials in concrete terms. By integrating multisensory, heritage-oriented, and ecological design approaches, the Design Phase generates a cohesive methodological foundation for proposing a restorative design framework for spa settlements. This framework forms the conceptual bridge between the analytical results and the broader conclusions of the study, demonstrating how restorative design can guide the sustainable and sensitive transformation of *spascapes*.

3. RESULTS

The results of this study are structured into two complementary design streams that reflect the methodological duality of the SPATTERN pedagogical framework. Design Stream 1 presents three thematic restorative design proposals, each addressing a different spa settlement through its specific disciplinary lens. Design Stream 2 introduces three unified restorative design applications for a single case study, Niška Banja, demonstrating how multisensory, heritage-responsive, and ecological approaches can converge within the same spatial context. Each of the six design proposals is presented through three analytical-design dimensions (1) Spatial–Morphological Dimension, (2) Programmatic–Functional Dimension, and (3) Environmental–Restorative Dimension. For each proposal, these dimensions are illustrated through three corresponding diagrams or visualizations. This triadic structure enables the projects to be examined comparatively, while also establishing a consistent analytical matrix that will be further explored in the Discussion section through a cross-project evaluation.

3.1. Design Stream 1

Multisensory Architecture – Radaljska banja

Within the valley-based geomorphological context of Radaljska banja, the design approach is based on a continuous linear trajectory that reads the terrain as a sequence of natural focal points. Conceived as a scenic route, it connects the spa core with key topographic and hydrological landmarks, responding to the valley's inherent linear movement logic. The concept draws on the site's therapeutic qualities – thermal healing water, forested environments, water surfaces, and microclimatic gradients, forming the basis for restorative

spatial experiences. The Radaljsko jezero zone is developed as a scene where landscape-therapeutic programs converge. These units, designed as minimal, landscape-sensitive interventions, function as resting areas, bathing platforms, and meditative spaces. Architectural configurations intentionally defer to nature, integrating with existing geomorphological and vegetative matrices. This approach positions Radaljska banja as a restorative landscape environment where geomorphology, sensory perception, and experiential movement intersect, producing a spatial narrative derived directly from the context.

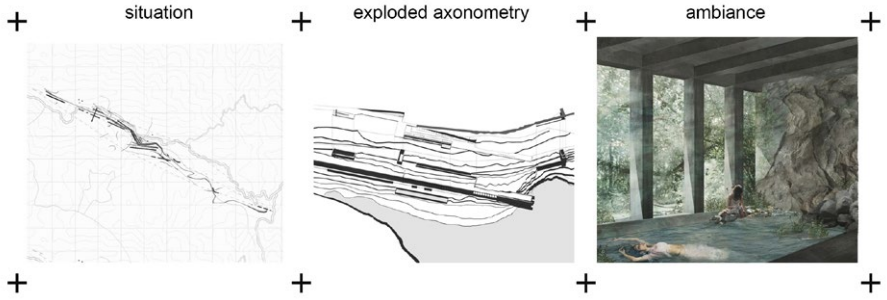

FIGURE 2. Design representation. (Studio M01 - Multisensory Architecture: Radaljska banja, class student Jelena Mihailovic, University of Belgrade - Faculty of Architecture, 2023)

Heritage Reprogramming – Banja Koviljača

The project focuses on reprogramming the ambient heritage of Banja Koviljača through the reinterpretation and integration of recognized architectural elements from protected structures and ambient zones of the royal period with natural protection areas. The intervention is organized linearly, along two orthogonal axes, aiming to traverse different levels of protection and critically reassess the degree of intervention. The main axis, connecting the central ambient zone with the Sanatorium, passes through three levels of spatial protection and is structured around thematic sequences (bathing, steaming, relaxation, meditation, fresh air) conveying the specific ambient characters developed over time. The minor axis, aligned with natural protection zones, symbolically forms a green barrier, marking the limit of further development. Constructive elements are derived by decoding architectural features from the protected context, recognizing their evocative potential. The approach critically examines architectural intervention within contemporary regulatory frameworks and fosters discussion on transmitting the memory of place within multi-layered protection zones.

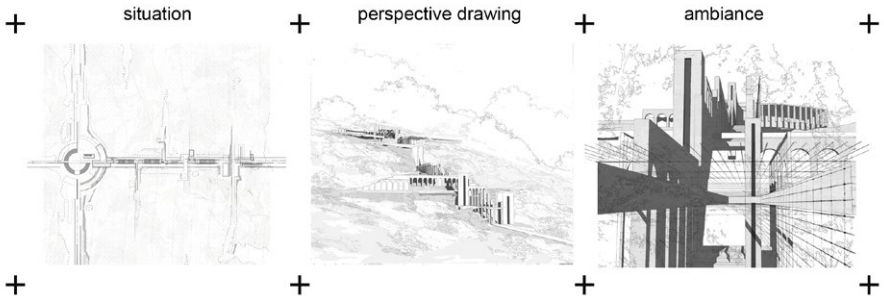

FIGURE 3. Design representation. (Studio M02 – Heritage Reprogramming: Banja koviljaca, class student Jelena Mihailovic, University of Belgrade – Faculty of Architecture, 2024)

Hybrid Naturalities – Vranjska banja

The design approach is based on recognizing the water-integrated landscape identity of Vranjska banja, exploring the role of water as a key element in shaping the narrative and ambient landscape. The intervention begins with an analysis of the spatial, social, and symbolic functions of water, which connect the historical layers of the spa with the contemporary practices of the local community. Water is employed as an integrator of natural processes and social narratives, interpreted through the analysis of historical postcards that reveal the spaces and practices of its use over time. The architectural gesture develops on two temporal levels: a permanent layer establishes a network of paths along the course of the Banjska river, incorporating public pools, springs, and fountains; a temporary layer consists of pavilion structures that highlight thermal-water sources and transmit knowledge of water-use technologies. The project aims to reinterpret complex landscape systems, establish a methodology for reading space, and reconsider the architectural role in preserving the identity of spa localities.

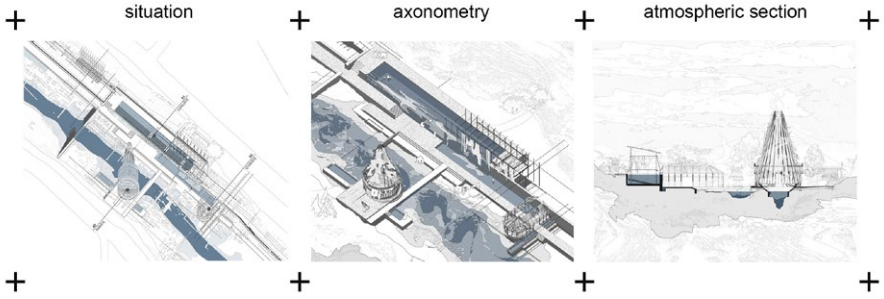

FIGURE 4. Design representation. (Diploma studio – Hybrid Infrastructures: Vranjska banja, class student Jelena Mihailovic, University of Belgrade – Faculty of Architecture, 2025)

3.2. Design Stream 2

Multisensory Architecture – Niška banja

The project investigates how the sensory heritage of Roman baths can be reinterpreted through contemporary multisensory architecture, using Niška banja as a case study. Although the spa was historically used in Roman times and is closely linked to Mediana, the remains of its baths remain undocumented, creating a gap between historical knowledge and spatial experience. By examining sensory qualities of Roman bathing (heat, humidity, acoustics, light, and movement) through examples such as the Baths of Caracalla and regional Moesia Superior sites, the research establishes a framework for translating these experiences into architectural form. The resulting design proposes a semi-submerged museum that integrates seamlessly with the surrounding landscape, emphasizing the notion of heritage that is present yet no longer visible. Conceived as an atmospheric and educational journey, the museum invites visitors to engage with history through embodied perception. Through spatial sequencing, gradients of temperature, sound, and materiality, the project evokes the cultural essence of Roman bathing and offers a new way of experiencing lost heritage within Niška banja.

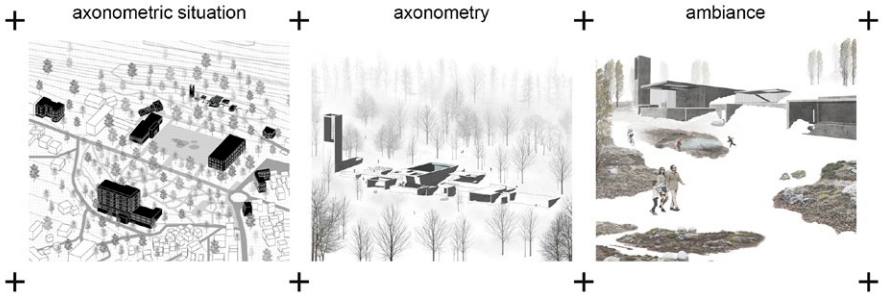

FIGURE 5. Design representation. (Studio MO1 - Multisensory Architecture: Niška banja, class student Mila Mitrovic, University of Belgrade - Faculty of Architecture, 2023)

Heritage Reprogramming – Niška banja

The sharp cultural and political shifts of the late 20th century led to the neglect and degradation of the interwar modernist heritage of Niška banja. The villa complex, originally designed by Russian and Yugoslav architects as an innovative expression of early modernism, gradually lost its spatial integrity and nature-filled atmosphere due to excessive urbanization. This project aims to reactivate the modernist ensemble by restoring lost vistas and reintroducing

spaces for relaxation within the natural landscape. Through new spatial, programmatic, and landscape elements, the villas become reconnected with each other and their surroundings, regaining cultural and functional relevance. Their aesthetic value, even in fragmented form, possesses strong evocative and emotional potential, forming a basis for enhancing collective memory. Archival research reveals lost visual axes, while analysis of architectural characteristics informs potential interventions. The resulting design introduces structures that reinterpret modernist fragments, integrate natural elements, and reweave the villas into a coherent network, revitalizing both the micro scale of each villa and the macro scale of the spa's urban fabric.

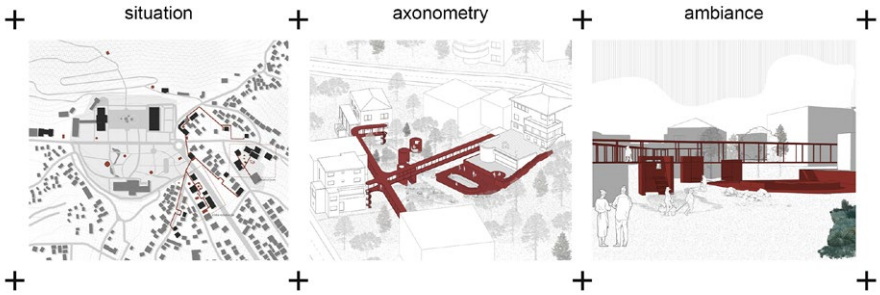

FIGURE 5. Design representation. (Studio MO2 - Heritage Reprogramming: Niška banja, class student Mila Mitrovic, University of Belgrade - Faculty of Architecture, 2024)

Hybrid Naturalities – Niška banja

The project interprets Niška banja as a temporal and spatial palimpsest, where the remains of Roman baths, the Ottoman hamam, and the modernist spa complex overlap within the same landscape. Over time, the loss of the earliest layers, especially the Roman thermae, has fragmented the identity of the site and weakened its cultural continuity. The design aims to restore this continuity by reactivating the "missing" layers through contemporary architectural expression. The new intervention is located where information is most lost, at the site of the Roman baths, reinterpreted as an underground multisensory museum and bathhouse that recalls the atmosphere of heat, water, and light rather than its original form. Smaller interventions engage the surrounding natural and urban fabric, connecting the modernist and Ottoman heritage into a coherent experiential sequence from the Republic Square to the Suva Banja spring, establishing a new balneological center that integrates history, landscape, and contemporary use.

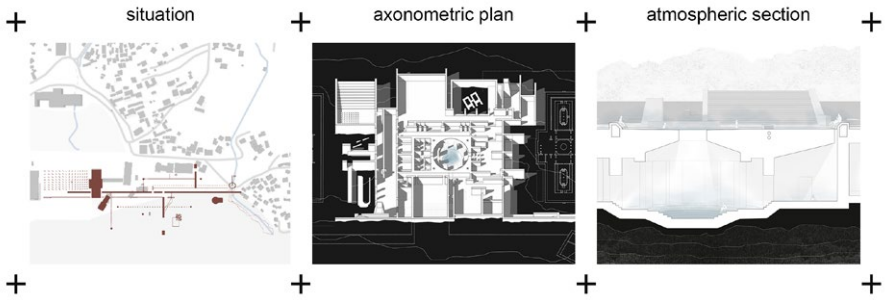

FIGURE 5. Design representation. (Diploma studio - Hybrid Infrastructures: Niška banja, class student Mila Mitrovic, University of Belgrade - Faculty of Architecture, 2025)

4. DISUCSSION

4.1 Cross-Project Analysis Across Three Dimensions

The six design proposals - three thematic (Design Stream 1) and three unified (Design Stream 2) - were comparatively examined through the triadic analytical framework consisting of the Spatial–Morphological, Programmatic–Functional, and Environmental–Restorative dimensions (Table 2). This cross-project analysis reveals distinct patterns of convergence and divergence, suggesting that despite disciplinary differences, the proposals consistently articulate a shared restorative logic adaptable to varied spa settlement contexts.

4.1.1. Spatial–Morphological Dimension

Across all projects, spatial structuring demonstrates a strong affinity for linear, axial, or spine-based organizational systems, whether derived from topography (Radaljska banja), heritage protection frameworks (Banja Koviljača), ecological corridors (Vranjska banja), or historically shaped settlement morphologies (Niška banja). Thematic projects tend to anchor their spatial logic in contextual readings: (1) a topography-driven axis in Radaljska banja, (2) a biaxial orthogonal system tied to regulatory zones in Banja Koviljača, and (3) a clustered spine reflecting hydrological processes in Vranjska banja. By contrast, the unified Niška banja proposals show more typological variability, shifting from linearity (MA), to rhizomatic dispersion (HR), to linear–clustered hybrids (HN). This suggests that when working within a single urban and heritage framework, differences in disciplinary emphasis (sensory, heritage, ecological) become more pronounced morphologically. Overall, the morphological dimension indicates that linearities, whether experiential, ecological, or heritage-derived, serve as privileged restorative instruments, enabling the reweaving of fragmented spa landscapes.

Design Proposal	Spatial–Morphological	Programmatic–Functional	Environmental–Restorative
MA – Radaljska banja	Topography-driven linear / axial	• Linear program organization • Therapeutic–experiential sequence • Series of atmospheric spaces	Landscape integration / Regenerative–Therapeutic
HR – Banja Koviljača	Hierarchical Biaxial / Orthogonal (urbanistic) Topography-driven linear (architecture)	• Regulatory sensitivity analysis • Reinterpreted ambient sequences • Clustered program organization	Natural–Cultural integration / Regenerative–Therapeutic
HN – Vranjska banja	Clustered + linear spine	• Thematic pavilion network • Reinterpretation of water-use community knowledge • Layered intervention: permanent core & temporary pavilions	Hydro–Cultural Reimagination
MA – Niška banja	Linear	• Linear program organization • Reinterpretation of the functional logic of Roman baths • Series of atmospheric spaces	Landscape integration / Heritage Reimagination
HR – Niška banja	Rhizomatic / dispersed	• Reactivation of the villas through new programs • Establishing functional connections between the villas • Reorganization of public spaces (paths, terraces, viewpoints, resting areas)	Heritage Revitalisation
HN – Niška banja	Linear (urbanistic) Clustered (architectural)	• Linear experiential route • Reactivation of lost historical layers • Creation of a new balneological center	Heritage Revitalisation / Heritage Reimagination

TABLE 2. Cross-Project Analysis Across Three Dimensions

4.1.2. Programmatic–Functional Dimension

The programmatic layer shows the clearest disciplinary signatures. Proposals rooted in multisensory architecture (MA) emphasize sequentiality, atmospheric transitions, and spatial programming that enhances embodied perception. Both Radaljska and Niška banja MA proposals rely on linear experiential routes composed of atmospheric chambers - an alignment that confirms the robustness of multisensory programming across different contexts. Heritage reprogramming (HR) projects prioritize reactivation, reinterpretation, and reconnection. In both Banja Koviljača and Niška banja, programmatic strategies revolve around: (1) reactivating historic buildings or ensemble fragments, (2) re-establishing functional or visual connections,

and (3) creating sequences that mediate between degrees of protection and contemporary use. Hybrid Naturalities (HN) proposals foreground water systems and ecological logics. In Vranjska banja, programming emerges from water-use cultural practices, while in Niška banja it is structured around the creation of a new balneological center and the re-inscription of lost historical water narratives (Roman–Ottoman–modernist palimpsest). Comparatively, the programmatic–functional dimension confirms that restorative design in spa settlements is inherently narrative, relying on the structuring of movement, memory, and ecological processes into spatial experience.

4.1.3. Environmental–Restorative Dimension

Across all six proposals, the strongest unifying theme is the incorporation of restorative, heritage-responsive, and ecological mechanisms into the design logic. Three major tendencies emerge: (1) Landscape Integration and Regeneration – Radaljska and Niška banja MA proposals deploy restorative effects through sensory landscapes, microclimate modulation, and terrain-sensitive integration, (2) Natural–Cultural Reintegration – HR–Banja Koviljača and HR–Niška banja reconnect natural and built heritage layers, emphasizing culturally embedded environmental restoration, (3) Hydro–Cultural Reimagination – HN proposals re-center water as a restorative and identity-defining medium, employing it simultaneously as ecological infrastructure and cultural narrative. This dimension demonstrates that restorative design in spa settlements is most effective when it operates at the intersection of material, sensory, ecological, and cultural systems.

4.2 Comparative Analysis Between the Two Design Streams

The distinction between Design Stream 1 (three different spa settlements) and Design Stream 2 (Niška banja as a constant) provides insight into how restorative design behaves under variable contextual conditions versus controlled comparative settings. Together, the two streams reveal that: (1) Design Stream 1 demonstrates situational adaptability, while (2) Design Stream 2 demonstrates methodological consistency Both are essential for formulating a Restorative Design Framework for Spascapes, capable of working simultaneously across typological diversity and within specific, layered heritage environments.

4.2.1. Contextual Adaptation (Design Stream 1)

When each proposal responds to a different spa settlement, the designs exhibit strong contextual specificity:

(1) Radaljska banja - terrain-driven sensorial immersion, (2) Banja Koviljača - heritage sequencing across protection zones, and (3) Vranjska banja - ecological and hydrographic layering. These thematic projects demonstrate the elasticity of restorative frameworks, adapting to geomorphology, heritage complexity, or ecological infrastructure. Restorative design thus proves capable of registering and amplifying unique territorial identities.

4.2.2. Controlled Divergence (Design Stream 2)

In Niška banja, the same spatial context produces three disciplinary interpretations: (1) MA - sensory reinterpretation of Roman baths, (2) HR - reactivation of interwar modernist villas, and (3) HN - reintegration of Roman–Ottoman–modernist layers into a new balneological axis. What differs most is not morphology, but what each discipline chooses to restore: (1) MA restores sensory atmospheres, (2) HR restores architectural and cultural continuity, while (3) HN restores hydrological, ecological, and temporal depth. This confirms that restorative design is inherently plural, enabling multiple restorative readings even within a single site. Design Stream 2 thus validates that restorative methodologies do not rely on site change, but on the perspective and disciplinary lens applied.

5. CONCLUDING REMARKS: SCENARIO-BASED SYNTHESIS

To synthesize the broader contribution of this research, the three disciplinary approaches (Multisensory Architecture, Heritage Reprogramming, and Hybrid Naturalities) can be understood as restorative scenarios, each offering a distinct pathway for aligning spatial design with environmental sensitivity and heritage context.

Scenario 1: *Multisensory Architecture* – Restorative Atmospheres and Embodied Perception

This scenario positions restorative design as an experiential and atmospheric process. It enhances well-being through: (1) spatial sequences, (2) gradients of temperature, sound, moisture, light, and (3) material tactility and microclimatic modulation. Both MA projects (Radaljska and Niška banja) demonstrate that sensory restoration can reveal latent heritage (Roman bathing rituals) and amplify natural terrains (valley-oriented landscapes). This confirms that multisensory design is a powerful instrument for reconnecting visitors to ecological and cultural layers through embodied experience.

Scenario 2: *Heritage Reprogramming* – Restorative Continuity and Adaptive Memory

This scenario understands restoration as cultural and architectural reactivation. It emphasizes: (1) adaptive reuse of heritage ensembles, (2) reinterpretation of architectural fragments, (3) re-establishing spatial connections lost over time, and (4) navigating regulatory and conservation layers. HR proposals in Banja Koviljača and Niška banja illustrate that spa settlements benefit from approaches that stabilize cultural memory while enabling contemporary use, producing restorative effects by healing discontinuities between time periods. Heritage becomes not a constraint but a dynamic restorative resource.

Scenario 3: *Hybrid Naturalities* – Restorative Ecologies and Temporal Palimpsests

This scenario frames restorative design as an eco-cultural regeneration process. It is grounded in: (1) hydrothermal ecologies, (2) water-based narratives, (3) blue–green infrastructures, and (4) intertemporal layering (Roman–Ottoman–modernist). HN projects show that spa settlements hold extraordinary potential as eco-cultural palimpsests, where restoring water systems also restores identity, memory, and social practices. This approach generates restorative spaces by revealing and amplifying ecological processes operating across multiple scales.

Synthesis of the Three Scenarios

Together, these scenarios demonstrate that restorative design in spa settlements is: (1) multidimensional (sensory, cultural, ecological), (2) scalable (from object to territory), (3) historically grounded yet forward-oriented, and (4) capable of producing diverse, yet compatible restorative outcomes. They collectively form the conceptual foundation for the Restorative Design Framework, which emerges as the central contribution of this research.

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Conflicts of Interest

The Science Fund of the Republic of Serbia had no role in the design of the study, in the collection, analyses, or interpretation of data, in the writing of the manuscript, as well as in the decision to publish the results.

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FLOATING SPASCAPES: COMPARATIVE REFLECTIONS ON THERAPEUTIC WATERSCAPES AND THEIR POTENTIAL IN SERBIA

ABSTRACT

Floating therapeutic landscapes have emerged as spatial and architectural responses to the growing demand for wellness-oriented environments in both urban and natural waterscapes. This paper investigates the concept of floating spascapes through a comparative analysis of selected European examples that integrate health, recreation, and ecological sensitivity. While such typologies are gaining traction in Northern and Western Europe, their strategic potential remains largely underexplored in the context of Serbian rivers and lakes. The study applies an analytical and case-based methodology to examine five floating wellness facilities: KOK (Oslo, Norway), Trosten Sauna (Norway), Wyld Sauna (United Kingdom), Arctic Bath Hotel (Sweden), and the Floating Sauna (Czech Republic). Each case is assessed based on site typology, architectural adaptability, ecological integration, and social accessibility. The findings inform their relevance and adaptability to Serbian waterscapes such as Ada Ciganlija, Lido, and Srebrno jezero. The research underscores the potential of floating wellness infrastructure to reimagine underutilised waterfronts in Serbia as inclusive, health-oriented, and climate-adaptive spaces. It extends the notion of spascapes beyond traditional land-based facilities into mobile, resilient, and publicly engaging aquatic environments, and demonstrates how floating wellness facilities can inform sustainable spatial planning and public health strategies in Serbia, particularly in riverine and lacustrine contexts.

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1. INTRODUCTION

Waterfront environments have long served as spatial and cultural hubs for healing, recreation, and communal gathering. Historically shaped by natural springs, medical practices, and architectural responses to therapeutic landscapes, spa settlements have evolved as complex socio-spatial typologies rooted in health tourism and ecological symbiosis (Gesler, 1992; Bertram & Rehdanz, 2015; Conradson, 2005). In the 21st century, growing environmental awareness and the demand for accessible health infrastructure have revitalised interest in nature-based solutions and blue-green infrastructure as strategies for urban resilience (Völker & Kistemann, 2011; Kim & Bae, 2020).

Within this discourse, ***floating therapeutic landscapes*** — modular or mobile health-oriented units located on rivers and lakes—are emerging as alternative spatial typologies that integrate wellness, public access, and ecological regeneration (Baker & Coutts, 2016; Calcagni, 2025). While floating architecture has seen a proliferation across Europe, particularly in residential and leisure contexts, its application in therapeutic and health-related design remains underexplored (Jaroszynska & Wolanski, 2019; Lago & Czapiewska, 2020). Examples such as *KOK* (Oslo, Norway), *SeeSauna* (Konstanz, Germany), and *Thermen am See* (Burgenland, Austria), illustrate how wellness architecture, environmental immersion, and public health functions can intersect in waterborne spaces (Baker, 2015; Dezeen, 2020).

In Serbia, however, the architectural and regulatory discourse has yet to embrace such typologies, despite the existence of latent potential along its inland waters—such as Ada Ciganlija, Lido, and Srebrno jezero (Tilinger & Lalić, 2008; Urban Planning Institute of Belgrade, 2021). These sites, often underutilised or lacking strategic planning, represent a unique opportunity to rethink traditional spa settlements not as fixed territorial enclaves but as flexible, floating infrastructures capable of supporting public health, recreation, and environmental resilience in a climate-challenged era. This paper addresses the following research question:

How can floating therapeutic landscapes contribute to the sustainable revitalisation of Serbian river and lakefronts, and what lessons can be drawn from relevant European case studies?

Through an analytical–comparative framework, this paper evaluates selected European examples according to indicators including modularity, integration with natural systems, therapeutic programming, and infrastructural feasibility. The aim is to extract design principles applicable to the Serbian context, while contributing to the theoretical and practical discourse on ***floating spascapes*** — a hybrid category at the intersection of architecture, health infrastructure, and ecological urbanism (UN-Habitat, 2019; Li et al., 2021).

2. METHODOLOGY

The research adopts a qualitative, comparative case study approach, suitable for evaluating the spatial and functional attributes of floating therapeutic landscapes across different geographical and regulatory contexts. The method is structured to identify transferable spatial patterns and design strategies applicable to underutilised river and lakefronts in Serbia. The study is grounded in an analytical-synthetic paradigm, combining desk-based research and typological analysis. Case study selection is based on typological diversity, contextual integration, and wellness-oriented programming. This approach enables the study to synthesise insights from heterogeneous floating wellness facilities without aiming for generalisation, but for context-sensitive design translation. Methodologically, the study relies on:

- Typological and morphological analysis,
- Qualitative content review of architectural and regulatory documentation,
- Visual and spatial referencing using publicly available tools,
- Comparative synthesis through structured evaluation categories.

This approach provides a systematic, academically grounded foundation for proposing floating spascapes as part of nature-based, health-oriented urban development strategies in Serbia.

2.1 Methodological Framework

The analytical framework is built on five case studies that reflect varied spatial, cultural, and environmental contexts across Europe: *KOK* (Oslo, Norway), *Trosten Sauna* (Norway), *Wyld Sauna* (United Kingdom), *Arctic Bath Hotel* (Sweden), and the *Floating Sauna* (Czech Republic). These cases were chosen for their diversity in:

- Waterscape typology (urban, semi-natural, remote),
- Programmatic scope (private vs. public access, full-service vs. minimal facilities),
- Integration with ecological, social, and infrastructural systems.

The evaluation criteria were developed based on prior research in floating architecture, wellness infrastructure, and environmental health indicators—particularly drawing from Baker & Coutts (2016), Calcagni (2025), and studies on the health effects of blue-green infrastructure (Völker & Kistemann, 2011; Kim & Bae, 2020). The following five indicators were used to guide the comparative analysis:

Evaluation Category	Description
Site Typology	Classification based on environmental and spatial context: urban waterfronts, riverbanks, lakefronts, or isolated natural settings.
Architectural Modularity	Prefabrication, spatial flexibility, scalability
Ecological Integration	Energy systems, wastewater management, material sustainability
Therapeutic Programming	Wellness functions: sauna, thermal baths, relaxation areas, public access, and potential inclusion of health services.
Infrastructural Feasibility	Anchoring, energy/water supply, transport and land–water connectivity

TABLE 1. Evaluation indicators for the comparative analysis of floating therapeutic landscapes.

The data for each case is collected from a combination of: architectural project websites, architectural publications and tourism portals, academic literature and conference documentation. The results of the cross-case comparison are presented in Table 1, providing a clear overview of each project's performance across the selected indicators. This serves as the foundation for evaluating adaptive potential in selected Serbian locations, namely Ada Ciganlija, Lido, and Srebrno jezero.

3. CASE STUDIES

3.1 Overview of Selected Case Studies

The selection of five European floating spa facilities was guided by their spatial typology, architectural relevance, therapeutic programming, and representativeness within different ecological and cultural contexts. All examples fall within the broader category of floating spascapes—health-oriented architectural interventions located on inland or transitional water bodies. The chosen case studies span both urban and remote settings and reflect diverse approaches to floating wellness design.

Table II provides a comparative overview of selected floating wellness facilities across Europe, emphasising their geographic and typological diversity, primary wellness functions, and contextual integration. The selection is based on relevance for potential adaptation within the Serbian context and reflects diverse approaches to floating architecture in urban and semi-natural settings.

Case Study	Location	Year	Architect / Designer	Context Type	Capacity (persons)	Primary Wellness Function
KOK Oslo	Oslo, Norway	2021	Snøhetta (concept), KOK Team	Urban / River	Up to 10 people	Sauna, Social Wellness
Trosten Sauna	Norway (Remote)	2020	Estudio Herreros	Remote / River	Up to 24 people	Sauna, Immersive Nature Therapy
Wyld Sauna	London, UK	2022	Third Nature	Urban / River	Up to 30 people	Sauna, Public Access
Arctic Bath Hotel	Harads, Sweden	2020	Bertil Harström & Johan Kauppi	Lacustrine	20+ (6 cabins + spa)	Hotel, Spa, Wellness Retreat
Floating Sauna	Český Krumlov, CZ	2022	H3T Architekti	Semi-Natural	4–6	Sauna, Public Wellness Access

TABLE 2. Overview of Selected Floating Wellness Facilities

The comparative insight offered by the selected case studies reveals an evolving paradigm of floating wellness architecture that transcends mere touristic novelty. While cases such as *Arctic Bath* and *KOK* Oslo demonstrate high design resolution and infrastructural feasibility, others, such as the *Floating Sauna* in Český Krumlov, highlight minimal-intervention strategies suitable for low-tech adaptation. These examples collectively inform the potential for context-specific replication in Serbia, particularly along urban rivers or natural spas, provided that regulatory alignment and modular implementation strategies are ensured.

3.2 Individual Case Study Analyses

3.2.1 KOK Sauna, Oslo – Urban Floating Wellness Hub

Architectural Modularity - The sauna is a prefabricated wooden structure mounted on a pontoon equipped with an outboard motor. Its compact rectangular plan comprises a sauna cabin, changing area, and shower zone, enclosed with panoramic glazing that maximises visual connection with the fjord. This modular and mobile design allows for high adaptability to diverse waterfront conditions and reflects a plug-and-play logic suitable for replication (Baker & Coutts, 2016; KOK Oslo Official Website, 2024).

Ecological Integration - While not fully off-grid, *KOK* Oslo operates with minimal ecological impact. It uses electric heating rather than wood-burning stoves, significantly reducing smoke emissions. Sanitation is managed via a dry composting toilet or connection to nearby marina facilities. Building materials include thermally treated timber and recycled insulation. However, the system lacks integration of renewable energy sources, which limits its environmental autonomy (Jaroszynska & Wolanski, 2019).

Therapeutic Programming - The facility offers a traditional Finnish sauna experience with opportunities for cold-water dipping, contrast therapy, and collective relaxation. Both private and group sessions are available, targeting mental wellness, immune response stimulation, and stress reduction. The architectural design enhances sensory immersion through visual transparency, exposure to natural elements, and passive airflow (Conradson, 2005; KOK Oslo Official Website, 2024).

Infrastructural Feasibility - Its small scale and propulsion system allow KOK Oslo to dock at existing marinas and waterfront edges without requiring permanent anchoring or utility grid connections. This drastically reduces regulatory and infrastructural burdens. Its temporary nature and operational independence make it a promising model for pilot interventions along Serbian rivers such as the Sava or Danube (Calcagni, 2025) (Figure 1).

KOK Oslo exemplifies how minimalist, mobile wellness infrastructure can reclaim urban waterscapes for public use. Its low-cost, adaptable configuration makes it particularly relevant for experimental deployment in the Western Balkans. Despite limited therapeutic programming and ecological autonomy, its integration into the urban fabric positions it as a pragmatic starting point for developing floating wellness typologies in Serbian cities.

FIGURE 1a. KOK Oslo floating sauna.

FIGURE 1b. Additional exterior view of the urban micro-wellness unit.

3.2.2 Trosten Sauna, Norway – Floating Micro-Wellness in Natural Context

Site Typology - *Trosten Sauna* is located on the Bjørvika side of the Oslofjord, positioned near the island of Langøyene. Unlike urban typologies such as *KOK* Oslo, Trosten is anchored in a semi-natural fjord setting, creating a liminal zone between wilderness and city. Its setting offers immersion in pristine waters while remaining accessible by urban boat transport. This hybrid positioning enhances a sense of seclusion while maintaining access to infrastructure (Trosten Sauna Official Website, 2024).

Architectural Modularity - The structure consists of a compact wooden sauna mounted on a floating dock, using prefabricated components. Its rectangular design houses a sauna chamber, a small entrance platform, and retractable ladders. It lacks an engine but can be towed, making it easily redeployable. The small size and lightweight materials support seasonal relocation and rapid deployment without permanent interventions.

Ecological Integration - Trosten employs a wood-fired stove, which contributes to atmospheric and sensory authenticity. Although emissions are present, the structure minimises ecological impact through the use of untreated wood, recycled metal components, and rainwater use for basic functions. Solar lanterns are used for lighting, emphasising a low-tech but ecologically aware setup.

Therapeutic Programming - The program centres on the Finnish sauna tradition—combining heat exposure, cold fjord immersion, and contemplative rest. It is designed for individuals or small groups, focusing on psychological well-being, circulatory stimulation, and nature-based therapy. The open water plunge is not a separate facility but an integral spatial and therapeutic component.

Infrastructural Feasibility - Due to its scale and design, Trosten requires no connection to land-based utilities or infrastructure. It is seasonally anchored and accessible by small boats or kayaks. Its installation does not require complex permitting or foundation work, supporting a decentralised and affordable approach to wellness programming (Trosten Sauna Official Website, 2024) (Figure 2).

Trosten Sauna exemplifies a minimalist but high-impact approach to floating wellness infrastructure. Its simplicity, low cost, and seasonal mobility offer a pragmatic model for Serbia's smaller or underutilised water bodies

FIGURE 2a. Trosten Sauna – floating unit in a semi-natural fjordcontext.

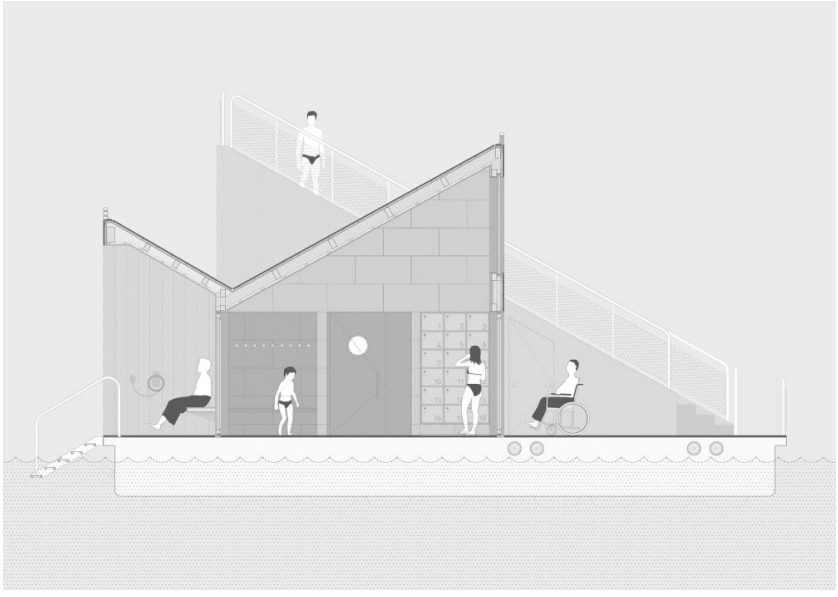

FIGURE 2b. Section of Trosten Sauna showing spatial layout

such as Srebrno jezero, Zasavica, or urban green–blue corridors. Unlike more complex examples, Trosten shows how therapeutic benefit can emerge from basic architectural interventions, provided they are sensitively placed and programmatically coherent. Its reliance on natural energy sources and low-tech materials align with eco-tourism and low-carbon development goals — though its use of wood-burning stoves introduces trade-offs that must be assessed in sensitive ecosystems. For Serbia, Trosten is a viable pilot model for municipalities seeking to experiment with floating wellness structures without the burden of heavy regulation or capital investment.

3.2.3 Wyld Sauna, United Kingdom – Regenerative Micro-Wellness on a Lacustrine Edge

Site Typology - *Wyld Sauna* is located on the banks of Loch Tay in Scotland, representing a lacustrine semi-natural context. Unlike urban saunas, this setting leverages the pristine environmental quality of the loch and surrounding hills to deliver nature-based therapy and mental restoration. The sauna's edge location allows for both visual immersion and direct access to cold water, embodying biophilic design principles (Wyld Sauna Official Website, 2024).

Architectural Modularity - The sauna unit is prefabricated and transportable, with a compact rectangular layout that includes a glazed façade facing the lake. Its lightweight timber construction and modular character allow for easy installation and disassembly, offering potential for replication across other natural water bodies in the UK and beyond. While not self-propelled, the unit can be trailer-mounted or floated into position (Baker & Coutts, 2016; Wyld Sauna Official Website, 2024).

Ecological Integration - *Wyld Sauna* demonstrates moderate ecological responsiveness through its use of sustainable timber, non-toxic insulation, and reliance on a wood-fired heater. Although it lacks integrated renewable systems, its operation minimises ecological disturbance. The unit uses dry sanitation and does not require connection to existing grid infrastructure, reducing its environmental footprint (Jaroszynska & Wolanski, 2019).

Therapeutic Programming - The sauna promotes thermal therapy in conjunction with wild swimming and mindfulness practices. Programming includes individual and group bookings, often integrated with yoga or guided relaxation sessions. The design emphasises intimate, sensory-rich experiences that appeal to health-conscious, ecotourism-oriented users (Conradson, 2005; Kim & Bae, 2020).

Infrastructural Feasibility - The sauna is manually positioned and anchored at the lake's edge without the need for permanent foundations. Access is via a small dock or gravel path, and utilities are minimised to essentials. The unit can operate off-grid, which makes it attractive for remote or seasonal deployment in Serbia's similar natural environments, such as Srebrno jezero or Vlasinsko jezero (Figure 3).

Wyld Sauna exemplifies how low-tech, high-impact design can redefine wellness infrastructure at the edge of nature. Its semi-mobile, off-grid, and nature-integrated model presents a viable template for replicability in Serbia's

ecotourism regions. However, the lack of integrated energy systems and limited year-round usability suggests the need for climate-adaptive modifications if transferred to other contexts. The project's greatest strength lies in its simplicity, ecological humility, and experiential depth.

FIGURE 3a. Wyld Sauna – modular floating sauna with urban integration and waterfront wellness programming.

FIGURE 3b. Wyld Sauna – interior with panoramic glazing.

3.2.4 Arctic Bath Hotel, Sweden – A Composite Lacustrine Wellness Facility

Site Typology - Situated on the Lule River in Swedish Lapland, *the Arctic Bath Hotel* represents a floating wellness complex in a remote, pristine environment. Its location enables immersive interaction with an untouched Arctic landscape, making it ideal for thermal tourism driven by natural stimuli such as snow, ice, and seasonal light phenomena (e.g., northern lights) (Arctic Bath Official Website, 2024).

Architectural Modularity - The complex consists of a central circular unit (spa and sauna hub), surrounded by six floating accommodation cabins. The cabins are prefabricated, modular, and easily transportable, made from locally sourced timber and insulated glass panels. The architectural configuration offers flexibility and adaptability across various lake and river environments (Dezeen, 2020).

Ecological Integration - The project is conceived with high ecological standards: it employs passive energy systems (solar gains, natural ventilation), low-impact anchoring mechanisms, and locally regenerative materials. Wastewater is treated on-site, and the overall footprint on the riverine ecosystem is minimal, offering a synergy between luxury and sustainability (Dezeen, 2020; ArcticCircle.se, 2024).

Therapeutic Programming - The wellness program includes traditional saunas, cold plunge pools, massage rooms, relaxation zones, and open areas for seasonal use. Emphasis is placed on contrast therapy (hot–cold), sensory recovery, and psychophysical balance through architectural design that frames the surrounding landscape. A multi-sensory therapeutic experience is emphasised—light, water, temperature, and silence (Arctic Bath Official Website, 2024).

Infrastructural Feasibility - The main spa unit is firmly anchored, while the accommodation cabins are buoyant and connected by floating walkways. The energy system integrates solar panels with conventional sources, and the facility includes autonomous water systems. Although more infrastructurally complex than smaller saunas, the project demonstrates that large-scale floating wellness structures can function effectively (Figure 4).

In contrast to smaller, mobile saunas, Arctic Bath Hotel exemplifies the potential of floating infrastructure for luxury health and eco-tourism. Its architectural approach enables not only physical relaxation but also emotional immersion into the Arctic landscape through seasonal phenomena and environmental silence. In the Serbian context, such a model could be envisioned on tourism-oriented lakes (e.g., Silver Lake), provided infrastructural adaptation and regulatory support are ensured.

FIGURE 4a. Arctic Bath - floating spa hub.

LEFT FIGURE. FIGURE 4b. Arctic Bath - modular floating cabins.

DOWN RIGHT FIGURE. FIGURE 4c. Arctic Bath - interior wellness space.

3.2.5 Floating Sauna, Sobáčov (Czech Republic) – Semi-Mobile Lacustrine Wellness Module

Site Typology - Located on a serene pond at *the Náš Sobáčov resort* in the Czech Republic, this floating sauna exemplifies a semi-natural, small-scale lacustrine typology. It balances controlled access with immersion in nature, offering wellness experiences in an intimate rural setting (Expats.cz, 2023).

Architectural Modularity - Designed by *Plovoucí sauny* in collaboration with Ateliér3M, the sauna is a prefabricated floating module built with steel pontoon foundations and thermowood timber slats. Its all-wood construction and trailer-movable design support rapid deployment, easy dismantling, and seasonal reuse—demonstrating modular functionality in rural wellness architecture (Expats.cz, 2023; plovoucisauny.cz).

Ecological Integration - The structure emphasises sustainability through locally sourced materials and passive building systems. A wood-burning stove provides heating, and its minimal spatial footprint reduces ecological disturbance. The design embodies a low-impact approach, though it does not incorporate renewable energy systems, instead relying on traditional yet sustainable construction methods (Hype & Hyper, 2023).

Therapeutic Programming - This module offers classic Finnish sauna rituals—heat followed by a plunge into open water—designed for private or small-group experiences. The simplicity of the program underscores sensory immersion, physical activation through cold exposure, and psychological rejuvenation rooted in traditional wellness practices (Expats.cz, 2023).

Infrastructural Feasibility - No fixed land utilities or permissions are required for installation. The unit operates autonomously and can be accessed by paddle boat or dock. This low-regulation, low-cost model allows for quick deployment, making it especially viable for rural or pilot wellness interventions (Figure 5).

The Sobáčov floating sauna embodies a pragmatic fusion of wellness tradition and rural sustainability. Its simple, transportable architecture and low infrastructural needs make it a prime candidate for rural or seasonal applications in Serbia—particularly around smaller lakes or caravan parks. While its lack of renewable energy systems limits environmental autonomy, its modular and mobile nature offers an agile template for grassroots wellness infrastructure that aligns well with community-driven, context-sensitive deployment.

LEFT FIGURE.FIGURE 5a. Floating Sauna CZ - exterior view.

RIGHt FIGURE. FIGURE 5b. Floating Sauna CZ - interior layout.

The following Table 3 presents a synthetic cross-case evaluation of five selected floating sauna projects in Europe, assessed through five context-specific indicators—site typology, architectural modularity, ecological integration, therapeutic programming, and infrastructural feasibility—with an additional column evaluating their replicability potential in Serbian waterscapes.

TABLE 3: Synthetic Evaluation of Representative Case Studies of Floating Architecture in Europe Based on Key Indicators

Case Study	Site Typology	Architectural Modularity	Ecological Integration	Therapeutic Programming	Infrastructural Feasibility	Replicability in Serbia *(Author's Note)*
KOK Sauna, Oslo	☑☑☑	☑☑☑	☑☑	☑☑☑	☑☑☑	Ada Ciganlija, Novi Sad, seasonal activation
Trosten Sauna, Norway	☑☑	☑☑☑	☑☑	☑☑☑	☑☑	Danube/East Serbia, youth tourism node
Wyld Sauna, Copenhagen	☑☑	☑☑	☑☑	☑☑☑	☑☑☑	Belgrade 25. maj, urban reconnection
Arctic Bath, Sweden	☑☑☑	☑☑☑	☑☑☑	☑☑☑	☑☑	Silver Lake (Srebrno jezero), wellness resort
Floating Sauna, CZ	☑	☑☑	☑	☑☑	☑☑	Rural spa node, testing pilot model

☑ – minimal

☑☑ – moderate

☑☑☑ – high

This cross-case synthesis confirms that floating sauna typologies—despite their scale and programmatic modesty—embody significant spatial, social, and ecological potential when strategically deployed. Projects like KOK Oslo and Wyld Sauna exemplify how minimal infrastructure can catalyse public engagement and health-oriented urban revitalisation, while Arctic Bath demonstrates the viability of more complex wellness-driven ecosystems in remote contexts. The adaptability of prefabricated structures, low-impact anchoring systems, and multi-sensory programming emerge as key enablers for successful transfer. However, for integration into Serbian contexts, legal recognition, modular production capacity, and marina-grade utilities remain critical prerequisites. As temporary or semi-permanent interventions, floating saunas offer a pragmatic testbed for broader policies on waterborne architecture and riverfront activation.

4. EVALUATION OF SERBIAN WATERSCAPES FOR FLOATING WELLNESS IMPLEMENTATION

4.1. Introduction and Methodological Rationale

The synthesis of European case studies has demonstrated that floating wellness infrastructure constitutes a viable and adaptable typology across urban, peri-urban, and natural contexts—provided that regulatory, ecological, and infrastructural preconditions are met (Calcagni, 2025; Bertram, 2010). Building on these insights, this chapter critically examines the transferability of such models to selected Serbian waterscapes, aiming to identify spatial opportunities and contextual limitations for local implementation. To ensure typological and geographical diversity, three sites were selected: *Ada Ciganlija* (an urban recreational zone), *Lido – Great War Island* (a protected fluvial landscape), and *Srebrno jezero* (a regional leisure lake). The selection was based on spatial criteria such as accessibility, infrastructural readiness, ecological sensitivity, and integration within regional tourism or development plans.

4.2. Geospatial Visualisation and Site Identification

Figure 6 presents a dual spatial analysis of two relevant geographical contexts in Serbia: the Belgrade riverfront (including *Ada Ciganlija* and *the Great War Island*) and the Veliko Gradište municipality (focusing on *Srebrno jezero*). These maps identify optimal sites for the implementation of floating wellness infrastructure, selected through a composite methodology involving field observations, review of regulatory frameworks, and overlay analysis using general and sectoral spatial documentation.

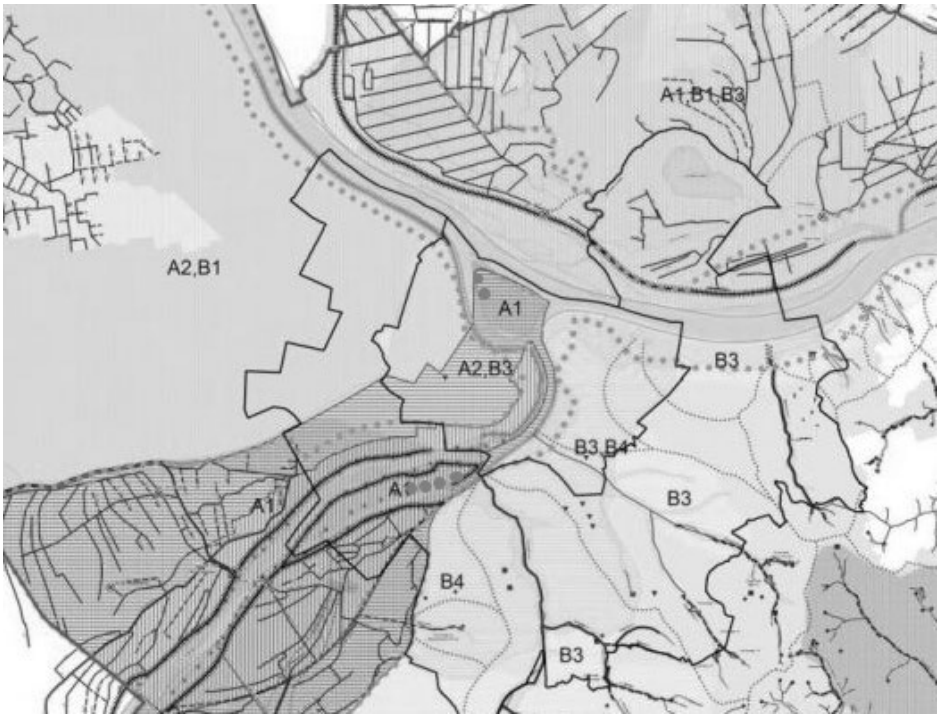

FIGURE 6a. Spatial analysis map - Belgrade waterfront.

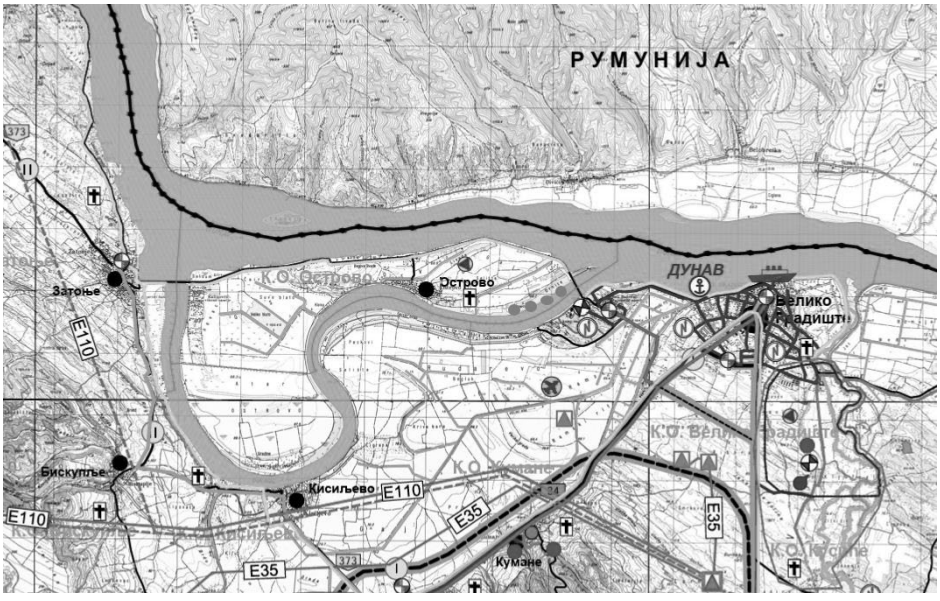

FIGURE 6b. Spatial analysis map - Srebrno jezero waterfront.

The left map illustrates selected zones along the *Sava River* in Belgrade. Three primary locations around *Ada Ciganlija* are indicated: The western shore of *the Ada Ciganlija Lake*, adjacent to sports and beach facilities—suitable for modular sauna units due to high accessibility and existing recreational infrastructure; The southern bank near *the Golf Club*, which offers seclusion for silent or nature-integrated wellness programs; The northern point near the *Jezero* restaurant and marina, benefiting from utility access and service logistics. Additionally, two sites on *Lido beach* and the western vegetated zone of *the Great War Island* (Veliko ratno ostrvo) are marked as eco-sensitive, seasonal intervention zones, where lightweight and reversible structures could align with conservation regulations. The right map displays the *Srebrno jezero* zone, located in the municipality of *Veliko Gradište*. High-potential locations are found along the southern bay and the urbanised eastern interface, where floating resorts, wellness capsules, or therapeutic clusters inspired by *Arctic Bath*–type models could be accommodated. These sites benefit from existing tourism infrastructure, controlled water access, and branding potential for spa-based tourism.

Taken together, these visualisations synthesise geospatial suitability, urban and touristic proximity, ecological sensitivity, and programmatic infrastructure. They serve as a foundational input for further spatial planning and pilot project formulation related to floating wellness architecture in Serbia.

Waterscape	Type	Potential Use Level	Strengths	Challenges	Transferability Potential
Ada Ciganlija	Urban peninsula with an artificial lake	Extremely High	Developed infrastructure, sports/spa zones, utilities	Legal harmonisation needed, EIA requirements	High – ideal for low-impact modular spa units
Lido – GWI	Protected natural zone, river island	Moderate to High	Pristine setting, close to the city, nature immersion	Strict protection regime, seasonal access, limited utilities	Moderate – seasonal, reversible wellness modules
Srebrno jezero	Artificial lake, tourism focus	High	Wellness brand, spatial flexibility, tourism visibility	Infrastructure support needed, EIA needed for floating units	High – resort-style spa and therapeutic modules

TABLE 4 - Spatial Assessment of Selected Serbian Waterscapes for Floating Wellness Facilities

4.3. Comparative Spatial Assessment

To evaluate the feasibility of floating wellness infrastructure in Serbia, a structured comparative matrix was developed across three typologically distinct waterscapes: *Ada Ciganlija, Lido (Great War Island),* and *Srebrno jezero*. The assessment integrates multiple criteria, including spatial typology, infrastructure availability, ecological sensitivity, regulatory limitations, and programmatic alignment with European precedents.

These three waterscapes collectively represent a typological continuum—from urban waterfronts and ecologically protected zones to regionally branded recreational lakes. This diversity offers a robust framework for evaluating the local adaptability of floating wellness typologies. Notably, *Ada Ciganlija* presents the most immediate opportunity for implementation due to its urban integration and recreational infrastructure. *Lido*, despite its natural allure and proximity to the city centre, requires carefully calibrated interventions in line with ecological preservation mandates. *Srebrno jezero,* as a semi-controlled recreational and touristic environment, emerges as a promising site for upscale, resort-style wellness concepts.

The comparative matrix in Table 4 serves as a baseline for integration with architectural, technological, and governance models derived from European case studies. This approach enables a place-sensitive strategy for pilot implementations, aligning spatial potential with regulatory and ecological feasibility.

4.4. Legal and Regulatory Context

The comparative spatial and regulatory evaluation indicates that *Ada Ciganlija* and *Srebrno jezero* offer the most favourable conditions for early-stage pilot projects involving floating wellness architecture. *Ada Ciganlija* benefits from robust urban infrastructure, year-round accessibility, and established recreational zoning. These characteristics make it a prime candidate for implementing modular sauna units or therapeutic docks with minimal legal barriers and high public visibility. *Srebrno jezero*, with its established identity as a tourism destination and branding aligned with wellness and leisure, presents significant potential for floating resorts and spa modules. Its spatial flexibility, coupled with moderate regulatory complexity, allows for the integration of larger, resort-scale wellness concepts—especially those drawing on Scandinavian typologies such as the Arctic Bath Hotel. However, the integration of such modules requires tailored infrastructural support and alignment with seasonal visitation patterns. In contrast, Lido (Great War

Island), despite its symbolic urban location and rich natural value, is subject to strict environmental regulations that restrict permanent construction. Nevertheless, its unique ecological character offers opportunities for seasonal, reversible wellness infrastructure—such as floating hammams, mobile thermal pods, or nature-based wellness barges. These interventions could function as educational or therapeutic nodes, emphasising low-impact and temporary use while respecting conservation protocols. To ensure the success of such initiatives, several implementation priorities have been identified:

- Legal harmonisation across municipal and national levels for regulating floating structures and clarifying water-use rights;
- Pilot testing of modular, off-grid, and reversible wellness facilities in controlled zones;
- Ecological compliance through integration of renewable energy (e.g., solar thermal), closed-loop waste systems (e.g., dry toilets), and floating wetlands;
- Participatory planning, involving local stakeholders, community organisations, and environmental agencies in decision-making processes.

These strategies align with international best practices in climate-resilient urban transformation and adaptive reuse of waterscapes (de Graaf, 2012; Calcagni, 2025). Floating wellness architecture emerges as a typology that bridges ecological sensitivity with public health innovation, offering scalable and modular solutions adaptable to both urban and natural settings.

The synthesis of this research suggests that Serbia's underutilised aquatic landscapes possess latent capacity for innovation through floating wellness interventions. *Ada Ciganlija* offers high infrastructural readiness and legal feasibility, while *Srebrno jezero* supports upscaled wellness tourism models. *Lido*, although constrained, may serve as a site for seasonal, symbolic, or demonstrative eco-interventions. Importantly, the issue of regulatory ambiguity—particularly concerning ownership, licensing, and ecological compliance in public waters—remains a critical bottleneck. Addressing this requires integrative spatial planning that includes floating structures within formal urban and environmental plans, supported by legislative updates and inter-agency collaboration.

5. DISCUSSION

The integration of floating wellness architecture into Serbia's aquatic landscapes represents more than a spatial or typological innovation; it signifies a paradigm shift in how post-socialist cities engage with their hydrological assets. The case studies and spatial analyses demonstrate that modular, climate-resilient wellness structures—such as floating saunas, spas, and therapy units—can act as catalysts for new socio-environmental relationships between urban populations and blue infrastructures (Baker & Coutts, 2016).

Crucially, the adaptability of floating wellness infrastructure depends on a triad of conditions: regulatory alignment, ecological compatibility, and infrastructural feasibility. For instance, Ada Ciganlija benefits from an already activated waterfront culture, which supports both regulatory simplification and public receptivity. Lido, on the other hand, exemplifies the tension between conservation imperatives and soft activation strategies, pointing to the value of reversible and seasonally adaptive solutions (Bertram, 2010; de Graaf, 2012). Srebrno jezero, by virtue of its wellness branding and flexible zoning, serves as a hybrid model—a testing ground for upscale therapeutic configurations that remain publicly accessible.

Another important dimension is the socio-cultural narrative that floating wellness projects can support. Unlike speculative waterfront development, these interventions are small-scale, public-oriented, and ecologically reflexive. As such, they offer spatial justice benefits—enabling broader public access to therapeutic landscapes without the exclusionary effects of privatised riversides.

Moreover, the emphasis on off-grid technologies (e.g., solar thermal energy, dry sanitation, rainwater harvesting) aligns with broader decarbonisation and sustainability goals. This opens new pathways for EU-aligned funding, intermunicipal cooperation, and cross-border knowledge exchange, especially with countries like the Netherlands, Germany, and the Nordic states. Incorporating environmental performance metrics into design and permitting phases is key to accessing EU cohesion or LIFE programme funding for nature-based wellness infrastructure.

Ultimately, floating wellness architecture is not merely a design experiment but a multiscalar solution—capable of operating at the intersection of public health, ecological stewardship, and inclusive urban regeneration (UN-Habitat, 2019; Li et al., 2021).

5.1. Potential Environmental Risks and Mitigation Strategies

While floating wellness infrastructures offer opportunities for ecological regeneration and climate adaptation, their deployment also carries potential environmental risks that must be critically assessed. Key concerns include disruption of aquatic ecosystems due to shading, which can reduce light penetration and photosynthetic activity in submerged vegetation, as well as altered water circulation and oxygenation caused by fixed pontoons or dense module clustering (Pedroso de Lima et al., 2022). Empirical studies have shown that floating urbanisation can lead to thermal stratification, reduced dissolved oxygen levels, and microhabitat fragmentation in shallow lake or river systems (Pedroso de Lima et al., 2022). Moreover, if not properly managed, the operation of floating saunas may lead to the leakage of greywater, organic waste, or even fuel residues (in self-propelled units), resulting in localised eutrophication and ecosystem imbalance (Baker & Coutts, 2016). Noise, artificial lighting, and increased human presence can further stress aquatic fauna, particularly in protected areas such as Lido or semi-natural lacustrine sites.

To mitigate these impacts, best practices from European precedents suggest integrating floating wetlands, vegetated buffer zones, and permeable pontoon systems that allow water and light to flow (Calheiros et al., 2020). Research on Floating Wetland Islands (FWIs) implemented in marinas demonstrates their ability to increase biodiversity and water filtration potential by supporting microbial and invertebrate communities (Calheiros et al., 2020). Additionally, the environmental performance of FWIs has been shown to improve nutrient removal and reduce algae bloom risks (Takavakoglou et al., 2021).

Renewable energy integration (e.g., solar thermal collectors) and closed-loop sanitation systems (e.g., dry composting toilets, greywater filtration) are essential for maintaining ecological balance and meeting EIA requirements (Takavakoglou et al., 2021; Pandey et al., 2018). Life-cycle analysis of such systems confirms their feasibility and sustainability for mid-scale deployment (Takavakoglou et al., 2021).

It is therefore recommended that all floating wellness interventions in Serbia be subject to Environmental Impact Assessment (EIA), with performance indicators including light transparency, oxygen levels, biodiversity monitoring, and nutrient output control. Long-term ecological monitoring—particularly in sensitive or protected waterscapes—should be institutionalised to ensure that these structures enhance, rather than degrade, aquatic habitats.

6. CONCLUSION

This study has explored the potential for implementing floating wellness infrastructure in selected Serbian waterscapes—Ada Ciganlija, Lido (Great War Island), and Srebrno jezero—through an analytical-synthetic framework informed by European best practices. The findings confirm that floating wellness typologies are both architecturally adaptable and contextually relevant, provided adequate regulatory instruments and ecological sensitivity support them.

Key contributions of this research include:

1. A comparative framework for assessing waterscape readiness,
2. Identification of three pilot-ready locations in Serbia,
3. Policy recommendations for regulatory harmonisation,
4. Emphasis on modular, reversible, and eco-friendly design principles.

Floating wellness architecture emerges as a scalable, inclusive, and climate-adaptive solution that can contribute to Serbia's green transition, post-pandemic recovery, and spatial reimagination of public health infrastructure. Rather than being residual or peripheral, rivers and lakes are recast as commons of care—sites where healing, education, and ecological awareness converge.

Future work should focus on pilot implementation, involving cross-sectoral partnerships, public engagement, and performance monitoring. Additionally, legislative amendments are urgently needed to incorporate floating structures into Serbia's spatial planning and environmental legislation. By doing so, Serbia has the opportunity to position itself as a regional innovator in blue-green infrastructure and regenerative urbanism.

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ABSTRACTS: SERBIAN

USKLAĐENOST INFRASTRUKTURE I ASISTIVNE TEHNOLOGIJE: MAPIRANJE PRISTUPAČNOSTI TURISTIČKIH ATRAKTORA SOKOBANJE ZA KORISNIKE INVALIDSKIH KOLICA

Milan Ristić

Ovo istraživanje ispituje pristupačnost Sokobanje za osobe sa telesnim invaliditetom koje koriste invalidska kolica kao asistivnu tehnologiju. Studija analizira odnos između prostorne morfologije banjskog naselja, njegovih turističkih atraktora i pristupačnosti urbanog i prirodnog okruženja. U istraživanju se primenjuje metoda mapiranja radi identifikacije barijera i procene stepena prostorne pristupačnosti za korisnike invalidskih kolica. Atraktori, kao što su kulturno-istorijski lokaliteti, javni prostori, prirodne celine, kategorizovani su kao tačkasti, linijski ili površinski elementi i evaluirani u skladu sa njihovom pristupačnošću. Istraživanje mapira usklađenost između prostorne organizacije banjskih sadržaja i pristupačnosti aktivnosti koje se u njima odvijaju. Rezultati pokazuju da su centralno šetalište i glavni javni prostori relativno pristupačni, ali da i dalje postoje značajne barijere u zonama sa strmim terenom i u objektima kulturnog nasleđa. Istraživanje doprinosi razumevanju načina na koji asistivne tehnologije stupaju u interakciju sa izgrađenim okruženjem i ukazuje na to da mapiranje može poslužiti kao metodološki alat za unapređenje pristupačnosti i usmeravanje inkluzivnog prostornog planiranja u banjskim naseljima.

KLJUČNE REČI: BANJSKA INFRASTRUKTURA, PRISTUPAČNOST, OSOBE U KOLICIMA, MAPIRANJE, INKLUZIVNI DIZAJN, SOKOBANJA

PAVILJONI IZVORA U VRNJAČKOJ BANJI: ARHITEKTURA MIHAJLA MITROVIĆA IZMEĐU PEJZAŽA I KULTURE

Andrej Jovanović

Rad istražuje banjsku arhitekturu Mihajla Mitrovića u Vrnjačkoj Banji kroz morfo-tipološku analizu četiri paviljona izvora (tzv. bivete), koja je izgrađena u banjskom parku u periodu između 1970. i 1990. godine. Banjski park, zamišljen kao centralni prostorni i kulturni okvir grada, predstavlja živi palimpsest u kome se prepliću prirodna morfologija, arhitektonska tipologija i kolektivno pamćenje. U okviru ovog pejzaža, Mitrovićevi paviljoni funkcionišu kao prostorni čvorovi koji artikulišu odnos između vode, terena i izgrađene forme. Kroz fenomenološki koncept genius loci, istraživanje tumači ove strukture kao arhitektonske medijatore koji izvore transformišu u mesta susreta prirode, istorije i kulture. Svaki paviljon otelotvoruje poseban morfološki i simbolički odgovor na svoj kontekst, otkrivajući Mitrovićevu sintezu tradicije i modernosti. Istraživanje redefiniše banjski park kao prostornu naraciju specifičnog banjskog identiteta, u kojoj arhitektura postaje medij pamćenja, kontinuiteta i kulturnog izraza.

KLJUČNE REČI: KULTURNI IDENTITET, ARHITEKTONSKO NASLEĐE, BANJSKA ARHITEKTURA, PAVILJONI IZVORA, JUGOSLOVENSKA ARHITEKTURA, VRNJAČKA BANJA, MIHAJLO MITROVIĆ

USKLAĐENOST INFRASTRUKTURE I ASISTIVNE TEHNOLOGIJE: MAPIRANJE PRISTUPAČNOSTI TURISTIČKIH ATRAKTORA SOKOBANJE ZA KORISNIKE INVALIDSKIH KOLICA

Miona Bradić, Milena Kordić

Rad istražuje pojam dokolice kao instrumenta koji odražava društvene okolnosti i oblikuje arhitektonski koncept, polazeći od analize geneze i transformacija ovog pojma kroz različite socioistorijske kontekste; od antičke scholē, preko industrijskog i socijalističkog modela rada i odmora, do savremenog informacionog društva i postradnih scenarija. Istraživanje se u prvoj fazi oslanja na interpretativno-istorijsku i teorijsku analizu arhitektonskih izvora, kao i na tumačenje kulturnih artefakata iz književnosti, filma i kulturne teorije, kako bi se sagledali načini na koje je dokolica redefinisana u različitim periodima. Druga faza primenjuje pristup istraživanja zasnovanog na projektovanju kroz studiju slučaja projekta hotela „Žiča" arhitekte Milana Zlokovića, paradigmatičnog primera ranog jugoslovenskog modernizma, sa ciljem razumevanja kako je dokolica materijalizovana kroz arhitektonski program i jezik modernizma. Završna faza, zasnovana na metodi research through design, koristi vizuelni kolaž kao interpretativni alat za uspostavljanje veza između istorijskih značenja dokolice i formulisanje vizije njene budućnosti. Rad ima za cilj da pokaže kako arhitektura može delovati kao medij za promišljanje i anticipiranje novih oblika dokolice u savremenom društvu.

KLJUČNE REČI: DOKOLICA, ODMOR, BANJSKI TURIZAM, MODERNIZAM, HOTEL ŽIČA,DOKOLICA KAO ARHITEKTONSKI PROBLEM

RAZMATRANJE ZAŠTIĆENIH PODRUČJA KAO TERAPIJSKIH PEJZAŽA: ULOGA KULTURNOG I PRIRODNOG NASLEĐA U CELOVITOM SENZORNOM BLAGOSTANJU

Relja Petrović

Banjski kompleksi se najčešće tumače kroz lekovita svojstva mineralnih voda i neposredni medicinski kompleks, pri čemu se bogatstvo šireg pejzažnog konteksta često zanemaruje. Ovaj rad reinterpretira Banju Slankamen kao terapijski pejzaž koji, kroz kulturno nasleđe, zaštićena prirodna područja i istorijski utemeljene prostorne strukture, zajednički doprinosi senzornom i emocionalnom blagostanju. Istraživanje se zasniva na kvalitativnom, interpretativnom prostornom pristupu utemeljenom na konceptima terapijskih i memorijskih pejzaža. Metodološki, rad kombinuje fokusirani pregled odabrane literature koja je bila povod za pokretanje istraživanja, posmatranje i apstrahovanje trajnih prostornih elemenata na osnovu istorijske karte s početka XVIII veka u korelaciji sa savremenim ortofoto snimcima, kao i prostorno preklapanje podataka o kulturnim dobrima i režimima zaštite prirode. Umesto stroge kartografske komparacije, analiza identifikuje postojane prostorne ose, koridore i morfološke odnose kroz koje istorijsko sećanje ostaje upisano u savremeni pejzaž. Rezultati izdvajaju tri analitičke oblasti sa različitim stepenima prožimanja kulturnih i prirodnih slojeva. Operacionalizacijom pejzaža sećanja kroz interpretativno mapiranje, rad doprinosi prenosivom konceptualnom i metodološkom okviru za promišljanje banjskih prostora kao otvorenih terapijskih pejzaža, zasnovanih na nasleđu.

KLJUČNE REČI: BANJSKI PEJZAŽI, STARI SLANKAMEN, BLAGOSTANJE, KULTURNO NASLEĐE, PRIRODNO NASLEĐE

ABSTRACTS: SERBIAN

ULOGA PREDEONE STRUKTURE U MORFOLOGIJI BANJSKIH NASELJA PANONSKOG BASENA VOJVODINE: KOMPARATIVNA ANALIZA

Anja Ljujić

Prostorno formiranje banjskih naselja u Vojvodini, sagledano u širem kontekstu Panonskog basena, ukazuje na snažnu, ali nedovoljno istraženu povezanost između strukture predela i urbane morfologije. Istraživanje je usmereno na tri banjska pejzaža: Rusandu, Kanjižu i Stari Slankamen, od kojih je svaki ukorenjen u specifičnom prirodnom okruženju, oblikovanom morfologijom reljefa, mikroklimatskim uslovima i vegetacijom, koji zajedno uspostavljaju analitički okvir rada. Primenom morfološke analize koja pejzaž pozicionira kao interpretativni okvir, rad analizira prostornu konfiguraciju banjskih naselja u odnosu na predeonu strukturu. Cilj rada nije uspostavljanje sveobuhvatne tipologije, već razotkrivanje raznolikosti i specifičnosti predeonih struktura unutar naizgled homogene nizije, kroz kvalitativno čitanje tri prostorna modela. Na taj način, istraživanje ukazuje na unutrašnju promenljivost pejzaža Panonskog basena kao fragilnog, slojevitog i ekološki kompleksnog sistema, te problematizuje nedovoljnu zastupljenost predeone strukture kao morfološkog činioca u arhitektonskom i urbanističkom diskursu. Banjska naselja, u većoj meri nego drugi oblici urbanih struktura, uspostavljaju neposredan i dugotrajan prostorni i funkcionalni dijalog sa prirodnim sistemima koji ih podržavaju, ukazujući na to da predeona struktura ne samo da uslovljava njihovu morfologiju, već aktivno oblikuje njihovu prostornu logiku i identitet.

KLJUČNE REČI: BANJSKI PEJZAŽ, PREDEONA STRUKTURA, MORFOLOGIJA, VOJVODINA, PANONSKI BASEN, KOMPARATIVNA ANALIZA

KA OKVIRU ZA RESTORATIVNO PROJEKTOVANJE: INTEGRACIJA OSETLJIVOSTI NA OKOLINU I KULTURNOG NASLEĐA U BANJSKIM NASELJIMA

Jelena Mihailović, Mila Mitrović, Aleksandra Milovanović

Ovaj rad predlaže okvir za restorativno projektovanje banjskih naselja integrisanjem osetljivosti na okolinu, kulturnog nasleđa i multisenzorne percepcije. Na osnovu interdisciplinarnog pregleda savremenih pristupa i pedagoške platforme SPATTERN projekta na Arhitektonskom fakultetu Univerziteta u Beogradu, istraživanje analizira šest projektnih predloga razvijenih u okviru tri master studija: Multisenzorna arhitektura, Reprogramiranje nasleđa i Hibridne prirodnosti. Istraživanje primenjuje dvostruku metodološku strukturu: (1) Design Stream 1, koji generiše tri tematska restorativna predloga za Radaljsku Banju, Banju Koviljaču i Vranjsku Banju; i (2) Design Stream 2, koji primenjuje tri disciplinarna pristupa na jednu studiju slučaja – Niška Banja. Uporedna analiza slučajeva otkriva ponavljajuće restorativne mehanizme (linearne iskustvene rute, sekvence reaktivacije nasleđa i eko-hidrologijske integracije), istovremeno pokazujući kako različite discipline oblikuju različite pravce restauracije. Izrađuju se tri sveobuhvatna restorativna scenarija: senzorno–atmosferska restauracija, kontinuitet nasleđa i adaptivno pamćenje, i eko-kulturna regeneracija. Rezultati pokazuju da banjska naselja poseduju jedinstvene prostorne, ekološke i kulturne uslove koje je moguće strateški iskoristiti kroz restorativno projektovanje.

KLJUČNE REČI: RESTORATIVNI DIZAJN, EKOLOŠKA SENZITIVNOST, REPROGRAMIRANJE KULTURNOG NASLEĐA, MULTISENZORNA ARHITEKTURA, HIBRIDNI EKOSISTEMI, ADAPTIVNA PONOVNA UPOTREBA, TERAPEUTSKI PEJZAŽI

PLUTAJUĆI SPASCAPES: KOMPARATIVNE REFLEKSIJE O TERAPIJSKIM VODENIM PEJZAŽIMA I NJIHOVOM POTENCIJALU U SRBIJI

Tijana Maksimović

Plutajući terapijski pejzaži pojavili su se kao prostorni i arhitektonski odgovori na rastuću potražnju za wellness okruženjima u urbanim i prirodnim vodenim pejzažima. Ovaj rad istražuje koncept plutajućih spascapes kroz komparativnu analizu odabranih evropskih primera koji integrišu zdravlje, rekreaciju i ekološku osetljivost. Iako ovakve tipologije postaju sve popularnije u severnoj i zapadnoj Evropi, njihov strateški potencijal u kontekstu srpskih reka i jezera ostaje uglavnom neistražen. Istraživanje primenjuje analitičku i studijsku metodologiju kako bi se ispitalo pet plutajućih wellness objekata: KOK (Oslu, Norveška), Trosten Sauna (Norveška), Wyld Sauna (Ujedinjeno Kraljevstvo), Arctic Bath Hotel (Švedska) i Floating Sauna (Češka). Svaki slučaj se ocenjuje prema tipologiji lokacije, arhitektonskoj prilagodljivosti, ekološkoj integraciji i društvenoj pristupačnosti. Rezultati ukazuju na relevantnost i mogućnosti prilagođavanja ovih koncepta srpskim vodenim pejzažima poput Ade Ciganlije, Lida i Srebrnog jezera. Istraživanje naglašava potencijal plutajuće wellness infrastrukture da transformiše neiskorišćene obale u Srbiji u inkluzivne, zdravlju posvećene i klimatski prilagodljive prostore. Rad proširuje pojam spascapes izvan tradicionalnih kopnenih objekata ka mobilnim, otpornim i javno angažovanim vodenim okruženjima, i pokazuje kako ovakvi objekti mogu informisati održivo prostorno planiranje i strategije javnog zdravlja u Srbiji, naročito u rečnim i jezerskim kontekstima.

KLJUČNE REČI: PLUTAJUĆI SPA CENTAR, TERAPEUTSKI PEJZAŽI, WELLNESS DIZAJN, SPA-PEJZAŽI (SPASCAPES), SRPSKI VODENI PEJZAŽI, ODRŽIVO PLANIRANJE, JAVNO ZDRAVLJE

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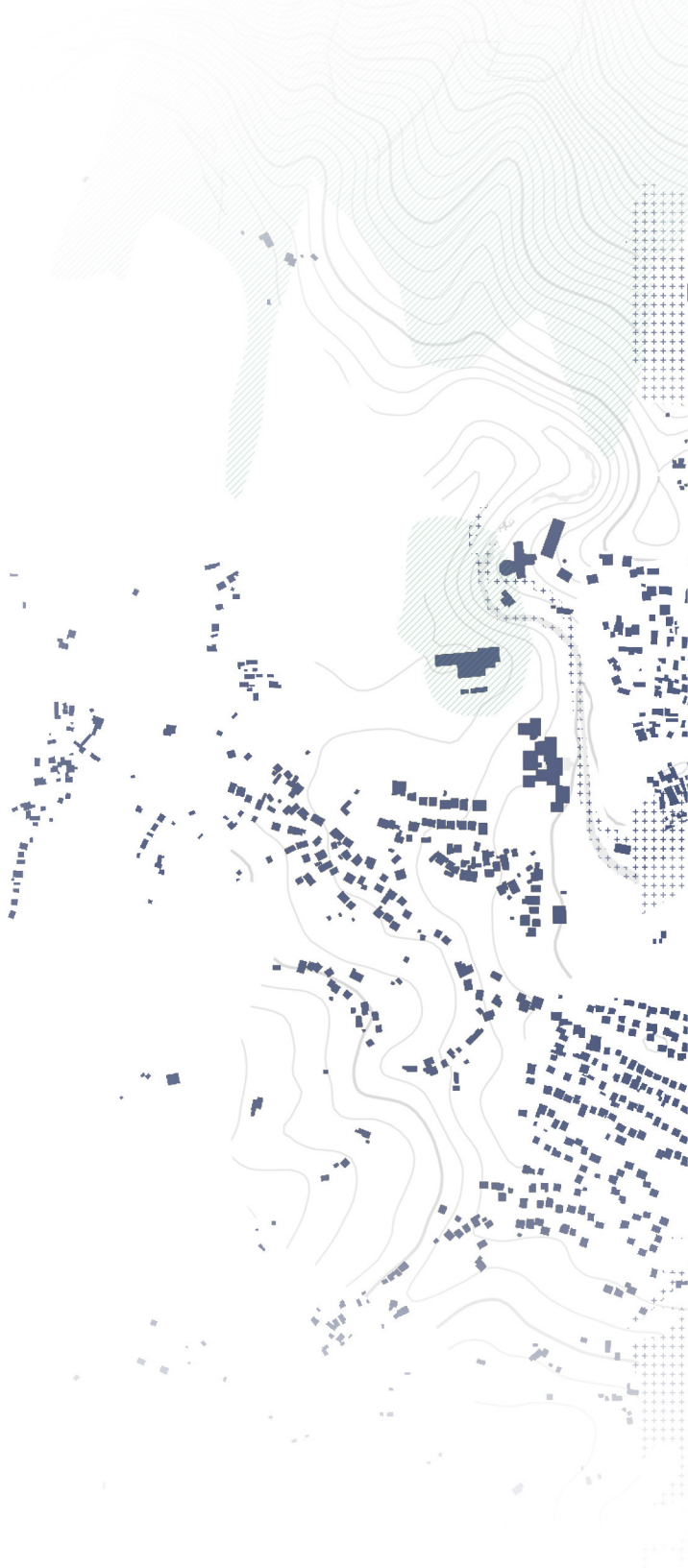

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