Reviving Lugoj's Timiș River Corridor: Blue-Green Resilience Through Restoration, Collaboration, and Heritage Preservation

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Abstract. This study aims to revive the blue-green corridor along the Timiș River in Lugoj to enhance resilience and accessibility. The paper contribution lies in proposing a Core Spatial Design Framework and applying it to Lugoj through differentiated intervention zone and case-specific design priorities. The framework combined river restoration, nature-based infrastructure, stakeholder collaboration, and community activation. Reactivating the corridor through this framework can improve flood resilience, biodiversity, and public accessibility while preserving cultural heritage.

Keywords: Blue-green Resilience, Heritage Preservation, Restoration, Blue-green Corridor, Blue-Green Revival.

1 Introduction

Lugoj is a city in Timiș County, Romania, located along the Timiș River. Initially, the city was divided into two towns, 'Romanian Lugoj' and 'German Lugoj'. The Romanian side developed first and has been developing organically. The German side has been planning its development with a stricter configuration (Bureșin, 2023).

As shown in Figure 1, historical postcards document the close relationship between the Timiș River and the built fabric of Lugoj, highlighting the river's former role in structuring the city's identity and visual character.

The Timis River divides the city into two towns, and for a time, it was seen as the border between them. In 1901, where the old wooden bridge connecting the towns once stood, the Iron Bridge was inaugurated along with its four customs towers (Bureșin, 2023).

The river was heavily used for various purposes, such as navigation, transport, and commercial exchange, as well as for recreational areas and leisure zones. It was the city's constant focal point, in active use year-round regardless of season.

Figure 2 further illustrates the former accessibility to the river corridor and its integration into public life.

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Fig. 1. Old postcards of Timis River.

Fig. 2. Old postcard showcasing accessibility to blue-green corridor.

On the Timis River, there is a small island that served as a leisure area, with a tennis court in the summer, pools for adults and children, and an ice-skating area in the winter. Currently, the river area is inactive, with no ongoing activity and restricted access to the riverbanks. The small island leisure area was torn apart by a flood in 2020; since then, it has been undergoing reconfiguration and reconstruction (Bureșin, 2023).

Figure 3 locates the study area within Lugoj and clarifies the spatial relationship between the historic center, the river corridor, and the former leisure island.

2 Current State Analysis of Lugoj's Timis River Corridor

Nowadays, the Timis River is unavailable to the community and lacks interaction with the city. This situation has a long list of inappropriate interventions, consolidations over time, and a lack of interest from the authorities.

2.1 Analysis of Accessibility

The river has a slope in the main areas that connect to the city; toward the ends, the riverbanks level with the city, making access easier. Although access increases near the city limits, the riverbanks no longer support activities as they once did.
In contrast to its long usage, further analysis of access points that no longer exist, those that still exist, and possible new access points.

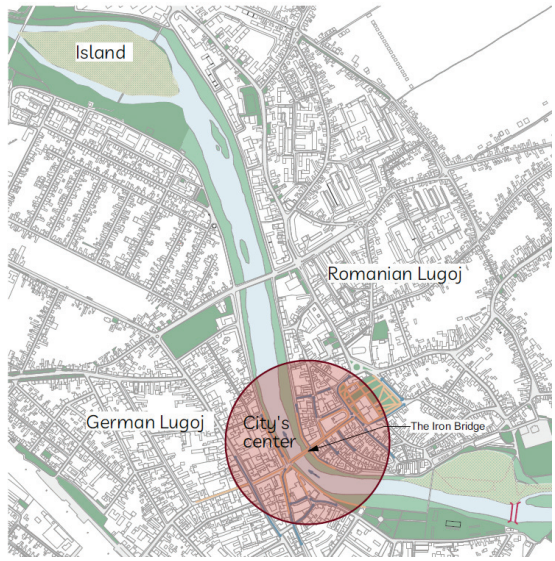

Fig. 3. Map of Lugoj.

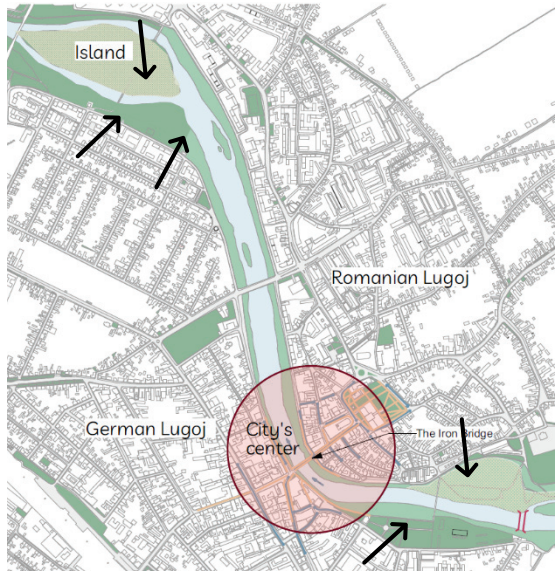

Fig. 4. Current access points to Timis River.

As shown in Figure 4, accessibility along the Timiș River is unevenly distributed. Riverbank slopes are gentler toward the city limits, facilitating peripheral access, whereas the central urban sectors lack viable entry points. The arrows indicate existing access location where physical barriers are lower and river contact remains possible.

This inverted pattern reveals a critical mismatch: the easiest points of entry are located in peripheral areas that remain underused, while the city center has almost no direct access to river. Such fragmentation justifies a connectivity intervention strategy that prioritize the central riverfront. The discontinuity od access along the Timiș River has contributed to an underutilized urban core and to the gradual loss of the river corridor's recreational value.

2.2 Identifying Potential Areas of Intervention

Strategic intervention along the Timis river should differentiates spatial roles in order to balance cultural activation with everyday use, aligning with core spatial design framework's multi-functional logic (Forgaci, 2018).

The differentiation of the yellow and blue zones shown in Figure 5 represents the author's analytical proposal, developed from the accessibility diagnosis, riverbank morphology, and the need to balance periodic cultural activation with everyday public use. The yellow areas indicate peripheral sectors that can absorb event-based activities due to their gentler slopes and existing access. The blue areas identify central sectors where reconnecting the river to the city through continuous public access is the primary design priority.

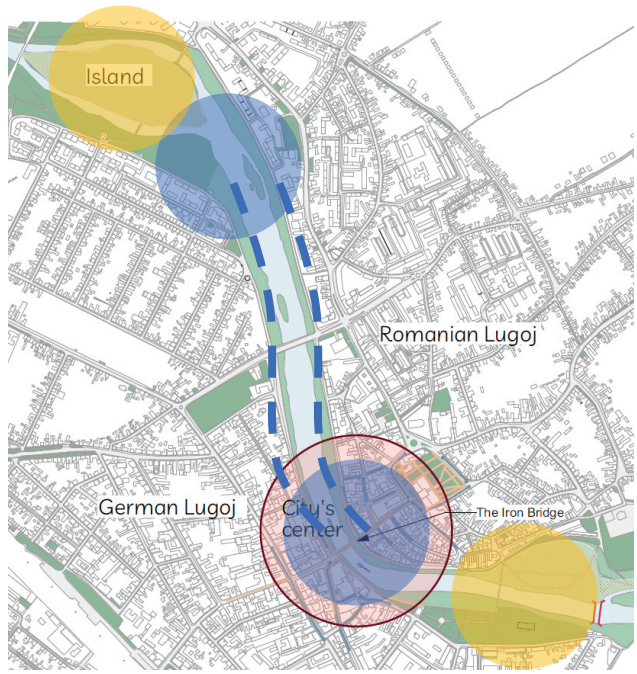

Fig. 5. Potential areas of intervention.

The central zones, marked in blue, should prioritize recreation and everyday use through bilateral bank access for continuous promenades, pedestrian paths, and bike lanes (Abo-Hashem et al., 2023). The connector and integrator instruments here resolve

central access gaps from Figure 5, creating vegetated ecotones that enable social-ecological overlap.

Multiple access points along the two key areas would boost usage and recreational value of the green spaces. Creating continuous pedestrian walkways along the Timis riverbanks would further enhance quality of life and activate the main urban zone. This approach would enable water-based activities like kayaking and paddle boating, land uses such as lounges, picnics, and leisure walks.

3 The Core Spatial Design Framework

Reintegrating the Timiș River into the urban life requires a social-ecological design approach that connects spatial structure, ecological restoration, and public use. In this study, the Core Spatial Design Framework is proposed as a multi-layered method for reviving the river corridor through five complementary dimensions: the integrated urban river corridor, strategic design instruments, nature-based solutions, community activation, and analytical resilience measures. Together, these dimensions provide an operational structure for transforming the currently fragmented riverfront into a resilient and accessible blue-green system.

3.1 Integrated Urban River Corridor

The first principle of the framework is to define the river area as an urban corridor rather than a simple linear edge. This perspective is important in Lugoj because The Timiș has historically acted both as a connector and as a line of division between differently developed urban fabrics. A corridor-based reading makes it possible to include the riverbanks, adjacent streets, public spaces ecological edges, and access sequence with one coherent system. The framework therefore focuses on three key spatial-morphological properties:

- **Three-dimensional Connectivity:** Ensuring movement for people, water and species across longitudinal, lateral and vertical dimensions (Espinosa et al., 2016; Forgaci, 2018).
- **Open Space Amenity:** Reclaiming abandoned and underused spatial capacity (Forgaci, 2018; Rybka & Mazur, 2018).
- **Social-Ecological Integration:** Spaces that perform multiple roles, such as a square that serves as a plaza during dry winter and a flood storage basin during storms (Forgaci, 2018).

In the Lugoj case, this perspective is necessary because isolated interventions would not resolve the broader separation between the city center and the river corridor.

3.2 Strategic Design Instruments

The strategic design instruments work as a coordinated set of interventions that operationalize the framework for Timiș River. They address complementary spatial and environmental issues: restoring access, increasing permeability, identifying critical nodes

of interventions, and ensuring that flood-protection measures remain compatible with urban fabric.

Applied to Lugoj, they establish a clear sequence of action from reconnection to resilience.

The framework relies on four design instruments that should be understood as an interdependent set rather than as separate actions. Together, they translate the spatial logic of the framework into operational interventions suited to the Timiș corridor:

- **The Connector**: reconfiguration of the city's spatial networks. Assigning vehicular traffic outside the river and slow lanes for pedestrians and cyclists along the riverbanks to remove the physical barrier created by roads (Abo-Hashem et al., 2023; Forgaci, 2018).
- **The Sponge**: Identification and repurpose permeable surfaces to maximize the area's ability to connect water and social activity (Forgaci, 2018).
- **The** Integrator**:** Identification of strategic points of intervention where social and ecological conflicts can be resolved (Forgaci, 2018).
- **The Scaler:** Ensuring a local flood-protection measure that does not negatively impact settlements and interventions (Forgaci, 2018).

Applied to Lugoj, these instruments suggest a sequence of actions: reconnect urban access, improve hydrological performance, intervene at critical nodes, and calibrate each intervention to wider flood dynamics.

3.3 Nature-Based Solutions

Nature-Based solutions provide the ecological and spatial means through which the framework can be implemented. Rather than treating the riverbanks as fixed edges, they allow the corridor to function as a dynamic interface between urban life and environmental processes.

- **River Rehabilitation:** Recovering natural functions such as filtration, habitat, even in dense areas (Espinosa et al., 2016).
- **Greenways:** Establishing continuous linear open spaces that serve as ecological corridors (Abo-Hashem et al., 2023).
- **Ecotones and Gradients:** Replacing vertical concrete embankments with vegetated transition zones that improve biodiversity and allow direct human interaction with water (Forgaci, 2018).

3.4 Activation of Communities Through Urban Tinkering

Restoration is not only a physical intervention but also a social process that depends on local participation and public commitment (Rybka & Mazur, 2018).

- **Participatory Processes:** Using workshops to turn residents into active stakeholders and engaging volunteers in the process.
- **Cultural Activation:** Creative awareness strategies, diverse events such as kayak activities, thematic festivals and music events to reshape the public's mental map of the river (Pattacini, 2021).

3.5 Applying Analytical Resilience Measures

Similarity and sameness: measuring the degree to which a city retains or improves its foreground network and functional characteristics after intervention.

- **Similarity and Sameness:** Measuring the degree to which a city retains its 'foreground network' and functional characteristics after a change.
- **Distributed Systems:** Aim for a 'distributed' city where global connectivity is shared across many streets rather than a 'structured' city that depends on a few vulnerable segments (Abshirini & Koch, 2017).

These analytical measures are important because help evaluate whether river-corridor revitalization improves not only the waterfront but also the wider urban structure of Lugoj.

4 Conclusion

The proposed Core Spatial Design Framework offers a structured method for reviving the Timiș River corridor as a resilient blue-green system within Lugoj. Once a focal point for navigation, commercial transport and recreation, the riverfronts had fallen inactive, with restrictive access. This framework shifts from such fragmented infrastructure toward integrated social-ecological design, redefining the river as a multi-dimensional urban corridor that reconnects divided communities (Forgaci, 2018; Rybka & Mazur, 2018).

Its strategic instruments can reconfigure the riverbanks by reducing traffic barriers, repurposing permeable surfaces, resolving social-ecological tensions, and adapting flood measures without disrupting settlements (Forgaci, 2018). Nature-based solutions like rehabilitated greenways would restore the lost functions, blending filtration, habitats, and public access even in dense context (Espinosa et al., 2016; Forgaci, 2018).

Community activation through participatory workshops and cultural events transforms residents, reshaping mental maps much like the river once anchored year-round civic life (Pattacini, 2021). Resilience analytics, emphasizing distributed networks over vulnerable segments, ensure the corridor Lugoj's dual organic-planned morphology against floods and change.

In the Lugoj case, this contribution is made concrete through the differentiated intervention logic in Figure 5, which translates the framework into site-specific priorities for access, activation, and ecological restoration.

In conclusion, this approach positions the Timiș River as a resilient urban backbone that reconnects ecological vitality, spatial continuity across historic divides, and renewed civic identity within a more coherent urban future.

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References

Abo-Hashem, M. H., Shalaby, A. S., & El Alaily, S. A. A. (2023). Linking cities to rivers in theory and practice: The case of Egyptian river cities. *Civil Engineering and Architecture*, *11*(3), 1538–1557. https://doi.org/10.13189/cea.2023.110334

Abshirini, E., & Koch, D. (2017). Resilience, space syntax and spatial interfaces: The case of river cities. *A/Z ITU Journal of the Faculty of Architecture*, *14*(1), 25–41. https://doi.org/10.5505/itujfa.2017.65265

Bureșin, C. A. (2023). *Redarea identității pierdute prin restaurare și interconnectare vizuală* [Restoring lost identity through restoration and visual interconnection] (Bachelor's thesis). Faculty of Architecture and Urban Planning, Politehnica University of Timișoara.

Espinosa, P., De Meulder, B., & Ollero, A. (2016). River restoration and rehabilitation as a new urban design strategy: Learning to re-see urban rivers. *The International Journal of the Constructed Environment*, *7*(3), 57–73. https://doi.org/10.18848/2154-8587/cgp/v07i03/57-73

Forgaci, C. (2018). *Integrated urban river corridors: Spatial design for social-ecological resilience in Bucharest and beyond* (Doctoral dissertation). Delft University of Technology. https://doi.org/10.7480/abe.2018.31

Pattacini, L. (2021). Urban design and rivers: A critical review of theories devising planning and design concepts to define riverside urbanity. *Sustainability*, *13*(13), 7039. https://doi.org/10.3390/su13137039

Rybka, A., & Mazur, R. (2018). The river as an element of urban composition. *E3S Web of Conferences*, *45*, Article 00077. https://doi.org/10.1051/e3sconf/20184500077

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