

SESSION E: THERMAL TECHNIQUE AND ENVIRONMENTAL PROTECTION

Urban acupuncture and visual activism as foundations for environmentally responsible riverside transformation: The case of the Vrbas River in Banja Luka

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ABSTRACT

Environmental protection of urban riparian spaces increasingly demands approaches that go beyond technical and regulatory frameworks - yet the role of cumulative small-scale interventions in establishing standards for future large-scale transformation remains poorly understood.

This paper asks: can student-led small-scale physical interventions and visual activism progressively build the spatial, pedagogical, and civic foundations necessary for environmentally responsible riverside transformation?

A qualitative analysis of three interrelated student initiatives along the Vrbas River in Banja Luka was conducted, spanning nearly a decade: the *Banjalučki mol* (2017), a wooden riverside platform realised through an international student workshop; the Sewage Pipes Festival (2021), combining spatial mapping and an urban installation to expose river pollution caused by absent wastewater treatment infrastructure; and the "*Vrbas is Neither a Construction Site - Nor a Trash Can*" campaign (2025), producing seven visual interventions with civil society organisations in response to illegal riverbed construction. Each case was examined through process documentation, material outcomes, institutional responses, and patterns of community engagement.

The *Banjalučki mol* revitalised a marginalised riverside location and demonstrated the public value of riparian space. The Sewage Pipes Festival initiated public debate on systemic ecological infrastructure. The 2025 campaign triggered inspection procedures and established civic monitoring as environmental advocacy.

Small-scale experimental projects, developed through student pedagogy over time, function not only as independent acts of environmental protection but as preparation for - and implicit criteria governing - future large-scale riverside transformation.

KEYWORDS

Environmental protection, Urban acupuncture, Visual activism, Vrbas River, Small-scale interventions, Riparian transformation, Student pedagogy.

1. INTRODUCTION

The relationship between cities and their rivers [1] has undergone profound transformation across the post-socialist world. In Banja Luka, the Vrbas River has long defined the city's landscape character and collective identity - a city traditionally described as green and dispersed, shaped by the presence of water [2, 3]. Yet despite this historical intimacy, the Vrbas today remains largely inaccessible along most of its urban course: its banks unregulated, its water polluted by direct

sewage discharge, and its riverbed subject to unauthorised construction interventions that proceed without public consultation or environmental assessment [4].

This condition reflects a broader pattern characteristic of post-transitional cities in the Western Balkans, where formal planning frameworks exist but function weakly, regulatory enforcement is inconsistent, and spatial decisions frequently reflect political rather than public interests [5]. In such contexts, environmental protection cannot rely solely on institutional mechanisms. It requires complementary approaches capable of operating outside - and in dialogue with - fragile regulatory systems.

This paper argues that small-scale experimental interventions, developed through student pedagogy over time, represent precisely such an approach. Rather than treating modest spatial and visual projects as ends in themselves, the paper proposes that their cumulative effect is the gradual construction of spatial precedents, ecological standards, and civic frameworks that define what environmentally responsible riverside transformation should look like. In this sense, small-scale interventions function not only as independent acts of environmental protection but as preparation for - and implicit criteria governing - future large-scale urban riverside transformation.

The argument is developed through qualitative analysis of three interrelated student initiatives along the Vrbas River in Banja Luka, spanning nearly a decade of practice: the *Banjalučki mol* (2017), the Sewage Pipes Festival (2021), and the "*Vrbas is Neither a Construction Site - Nor a Trash Can*" campaign (2025). Together, these cases trace a progression from physical revitalisation of marginalised riverside space, through the making visible of systemic ecological problems, to active resistance against environmental degradation - each intervention building on the last, and each contributing to a cumulative body of spatial and civic knowledge about what the Vrbas riverfront can and should become.

2. METHODOLOGY

This paper employs a qualitative research methodology based on case study analysis. The case study approach was selected as appropriate for the research question, which concerns the cumulative effects of small-scale interventions in a specific urban context over time - a phenomenon that resists quantification but is amenable to systematic qualitative examination [6]. Three cases were analysed: the *Banjalučki mol* (2017), the Sewage Pipes Festival (2021), and the "*Vrbas is Neither a Construction Site - Nor a Trash Can*" campaign (2025). The cases were selected on the basis of three criteria: direct engagement with the ecological and spatial conditions of the Vrbas River in Banja Luka; involvement of architecture students as primary agents; and the availability of documentary evidence sufficient for systematic analysis.

Each case was examined through four categories of evidence: process documentation, including workshop programmes, participant records, and organisational materials; material outcomes, including built structures, visual artefacts, mapping products, and installation documentation; institutional responses, including inspection records, media coverage, and administrative decisions; and patterns of community engagement, including social media metrics, civic network activity, and evidence of sustained participant involvement beyond individual projects.

Data were drawn primarily from internal project documentation produced by the Centre for Spatial Research and APLE Lab, supplemented by published conference papers, professional magazine articles, and direct observation by the authors as participants in all three initiatives. This participant-observer position carries both advantages and limitations: it provides access to process dimensions and contextual knowledge unavailable to external researchers, while requiring careful reflexive attention to the risk of confirmation bias in interpretation. The analysis addresses this risk by maintaining a consistent analytical framework across all three cases and by explicitly acknowledging the structural limitations of each intervention alongside its achievements.

The analytical framework applied across cases draws on four theoretical constructs developed in the preceding section: urban acupuncture and small-scale intervention logic; visual activism as environmental advocacy; experimental student pedagogy; and the cumulative "massive, small" logic of incremental spatial change. Each case is assessed against these constructs, and the cross-case analysis in the Discussion section identifies the cumulative pattern that emerges from their combination.

3. THEORETICAL FRAMEWORK

3.1. Small-Scale Interventions and Urban Acupuncture

Contemporary urban theory increasingly recognises that large-scale planning alone is insufficient to address the complexity of post-transitional cities. Urban space is better understood as a multi-scale system in which small, precisely located interventions can generate effects disproportionate to their physical dimensions [7]. This logic underpins the concept of urban acupuncture, developed by Jaime Lerner, which draws on the medical metaphor of the needle: an intervention at a specific point produces not only a local effect but a systemic response across the wider urban body [8]. Manuel de Solà-Morales extends this argument, proposing those small-scale urban projects - precisely because of their proximity to human dimension, perception, and everyday life - can serve as the foundation for larger strategic transformations [9].

Jan Gehl's research on public space confirms that modest interventions, such as the placement of benches or the creation of accessible edges along water, significantly improve urban activity and social interaction [10]. Small-scale is therefore not an aesthetic category but a social and psychological one: it operates at the scale of the human body, perception, and

the possibility of encounter [11]. Critically, small-scale interventions must always be understood as components of a larger system - their value lies not in isolation but in their capacity to catalyse further change and to accumulate into a coherent spatial narrative [7].

3.2. Visual Activism and Environmental Advocacy

Visual communication has emerged as a significant instrument of environmental advocacy, particularly in contexts where institutional channels are weak or captured by political interests. As W.J.T. Mitchell argues, images are not passive representations but active agents capable of producing effects that exceed those of textual or technical communication [12]. Their simultaneous, affective register enables them to cross linguistic, disciplinary, and social boundaries, reaching publics that professional planning discourse rarely engages [13].

In the specific context of spatial and environmental activism, humour and visual irony have proven particularly effective strategies. By combining emotional engagement with critical distance, they generate what Ann Thorpe describes as a redirection of visual production from market-driven persuasion toward political critique and public awareness [14]. This approach is especially relevant in post-socialist contexts, where distrust of official discourse is widespread and alternative communicative channels - social media, civic networks, informal circulation - carry significant weight in shaping public perception of spatial decisions.

3.3. Experimental Student Pedagogy and Social Responsibility

The pedagogical dimension of the interventions analysed in this paper draws on a tradition of experiential and critical learning in architectural education. Paulo Freire's critique of "banking education" - in which students passively receive knowledge for later professional application - remains foundational: authentic learning emerges through engagement with real problems, real consequences, and real communities [15]. Donald Schön's concept of reflective practice formalises this process, distinguishing between reflection-in-action and reflection-on-action as complementary modes through which professional judgment develops under conditions of genuine uncertainty [16].

Etienne Wenger's framework of communities of practice further clarifies how learning occurs through participation in collective work oriented toward shared objectives [17]. When students collaborate with civil society organisations, affected communities, and institutional actors, they develop capacities - strategic thinking, communicative flexibility, civic commitment - that conventional studio pedagogy cannot cultivate. The workshop format, as applied in the cases examined here, operationalises these frameworks: it positions students as co-investigators rather than recipients, and treats real spatial problems as the primary medium of education.

3.4. Cumulative Logic: Massive, Small

The three cases examined in this paper share a common logic that Katie Campbell terms "massive, small": the recognition that substantial urban change can emerge not from singular large-scale interventions but from the strategic accumulation of multiple modest actions, each individually limited but collectively consequential [18]. This logic has relevance for environmental protection in contexts of institutional fragility, where large-scale transformation is rarely achievable through formal planning alone. Small interventions establish spatial precedents, build community identification with place, and generate civic knowledge about what a given environment can and should become - gradually constructing the conditions under which responsible large-scale transformation becomes both possible and accountable.

4. CASE STUDIES

4.1. Banjalučki Mol (2017): Physical Revitalisation and the Public Value of Riparian Space

4.1.1. Context

The right bank of the Vrbas River in the Mejdan neighbourhood, directly across from the medieval Kastel Fortress, represents one of the most historically significant yet spatially neglected stretches of the urban riverfront in Banja Luka. Despite its proximity to the city centre and its exceptional landscape qualities, the location functioned for decades as an underused, inaccessible margin - neither properly maintained nor integrated into the everyday life of the city. It exemplified a broader condition of the Vrbas in Banja Luka: a river present in the city's identity and imagination, but largely absent from its functional public space [2, 3].

4.1.2. Process

The *Banjalučki mol* emerged from the small SCALE international student workshop, organised by the Centre for Spatial Research (Istraživački centar za prostor) in Banja Luka. The workshop brought together students from three universities - the Norwegian University of Science and Technology (NTNU) in Trondheim, the University of Sarajevo Faculty of Architecture, and the University of Banja Luka Faculty of Architecture, Civil Engineering and Geodesy [19]. The project was developed within the framework of the HERD Energy university cooperation programme, supported by the Norwegian Ministry of Foreign Affairs.

The workshop followed an established small SCALE methodology: an initial phase of research and critical analysis of the urban context, followed by collaborative architectural design, and concluded by a five-day on-site construction phase in which students themselves built the structure [6]. Throughout the design process, residents, city representatives, and

local associations were engaged through presentations and dialogue, introducing a participatory dimension uncommon in local planning practice.

The project thus operated simultaneously on three levels: as an educational experiment in applied, community-engaged architectural pedagogy; as a bottom-up spatial intervention in a context where formal planning processes had failed to address the riverside; and as a civic act demonstrating the possibility of public space activation through collaborative, non-institutional initiative.

4.1.3. Intervention

The result of the workshop was a wooden structure of 92 m², comprising a meandering walkway platform threading between existing trees, a small dock extending toward the river, and a series of benches - a combination of urban, landscape, artistic, and architectural design [19]. The simple form derives directly from the spatial conditions of the site, leaving room for appropriation and informal use by visitors. The structure was designed to fulfil two qualities considered essential for strong public space: a clear spatial identity and a concept of open, unprogrammed use [19].

The *Banjalučki mol* was one of the first architectural interventions in open public space along the Vrbas in Banja Luka, and as such attracted significant attention from both the professional community and the general public. Although built on a location previously considered marginal, it gradually became accessible to an increasing number of everyday users and acquired the reputation of one of the favorite places in the city [19]. The project received the BIG SEE Architecture Award in 2019, gaining regional recognition as an example of the possibilities and effectiveness of urban acupuncture.

4.1.4. Environmental and Spatial Significance

From the perspective of environmental protection, the *Banjalučki mol* performed a function that technical or regulatory interventions alone cannot achieve: it established an affective and social relationship between the urban population and the riparian environment. By making a neglected stretch of the Vrbas accessible, legible, and desirable as public space, it generated what can be understood as civic identification with the river - a precondition for any sustained commitment to its protection.

The project also initiated a chain of subsequent changes along the riverside, consistent with the acupuncture logic of systemic response to a precisely located intervention [7]. New activities, informal appropriations, and institutional attention followed, demonstrating that a single modest structure can alter the trajectory of an urban area over time. In this sense, the *Banjalučki mol* established the first spatial precedent in the cumulative argument this paper develops: that the Vrbas riverfront is a public asset of demonstrable value, deserving of protection, investment, and responsible transformation.



Figure 1: Banjalučki mol, 2017. a) The view towards the Kastel fortress and Ferhadija mosque; b) Student construction workshop. Photos by small SCALE

4.2. Sewage Pipes Festival (2021): Making Invisible Pollution Visible

4.2.1. Context

Despite its central role in the identity and landscape of Banja Luka, the Vrbas River functions today as the city's primary open sewage collector. Dozens of direct discharge points can be identified along its urban course, the consequence of a sewage system first constructed in 1912 that has never been complemented by a wastewater treatment facility [4]. The scale of this problem is significant: untreated municipal wastewater enters the river continuously, degrading water quality, producing persistent odour, and rendering the riverbanks inhospitable for much of the year. Yet despite its longevity and visibility, the problem has consistently remained outside political debate and public awareness [4]. This condition of systematic invisibility - in which an ecological crisis of considerable scale is collectively normalised and administratively ignored - constitutes the core problem that the Sewage Pipes Festival set out to address. The festival proceeded from the premise that environmental protection in such contexts requires not only technical solutions but communicative ones: the problem must first be made visible before it can become the object of civic demand and political action.

4.2.2. Process

The Sewage Pipes Festival was organised by the Centre for Spatial Research in Banja Luka, in partnership with the Faculty of Architecture, Civil Engineering and Geodesy and the Academy of Arts of the University of Banja Luka, with co-financing from the Embassy of France in Bosnia and Herzegovina [4]. The central component of the festival was a student workshop bringing together participants from both faculties, structured around the small SCALE methodology established in previous projects [6].

Over six days, the workshop combined analytical and design phases with public performance and installation. Lectures on hydrotechnics, water landscape, contemporary visual arts, and urban public space accompanied the students' analytical process, supporting an interdisciplinary engagement with the problem that crossed the boundaries of architecture, ecology, and visual communication [4]. The workshop thus continued and extended the pedagogical model developed through the *Banjalučki mol*, applying it to a problem that was ecological and political rather than primarily spatial.

4.2.3. Interventions

The festival produced a diverse set of outputs, each addressing the problem of river pollution through a different communicative register and targeting a different audience [4]:

Spatial mapping was conducted through public urban walks and boat rides along the Vrbas, during which students systematically documented sewage discharge points within the urban stretch between the Green and Rebrovac bridges. This produced the first publicly available visual record of the scale and distribution of the problem.

The *S.O.S. for Vrbas* performance deployed coloured smoke signals along the river, sending a clear visual message about the state of pollution to both riverside users and the broader public - a performative gesture rendering the invisible infrastructure momentarily and dramatically present. A festival walks through the city centre carried banners with visual messages that addressed the problem through humour and accessible visual language, engaging passers-by in informal dialogue about pollution and its causes.

A spatial installation on Krajina Square - the main public square of Banja Luka - was constructed from plastic sewage pipes of various lengths and configurations, placing users at the centre of a simulation of the city's sewage system. The installation materialised the problem at the heart of the city's public life, raising awareness of its immediate presence in everyday experience and communicating the scale of the infrastructure deficit through direct spatial encounter [4].

Exhibition panels presented the analytical results of the mapping exercise, demystifying the technical dimensions of the problem and providing factual grounding for public debate. A complementary exhibition, *Landscape of Vrbas - Conditionally*, presented eight urban projects treating the river under one shared condition: clean water.

4.2.4. Environmental and Spatial Significance

The Sewage Pipes Festival achieved measurable communicative impact: festival-related content reached approximately 10,000 views across social media platforms, and the event generated coverage across internet portals and television programmes [4]. More significantly, it initiated a public debate about the Vrbas pollution problem that had previously been absent from civic discourse and established a connection between the local activist and professional community and the broader initiative for the construction of a wastewater treatment system.

From the perspective of the cumulative argument developed in this paper, the festival performed a distinct and essential function within the sequence of interventions. Where the *Banjalučki mol* had established the public value of the riparian space - demonstrating what the Vrbas riverfront could be - the Sewage Pipes Festival established the ecological standard it must meet: a river that is clean, accessible, and integrated into the city's public life as a living environment rather than an open drain. This standard, articulated through visual and spatial means accessible to non-specialist publics, constitutes the second layer of the cumulative framework of criteria that small-scale interventions progressively construct.



Figure 2 a) A part of the S.O.S for Vrbas performance; b) Citizens interacting with the small-scale spatial installation on Krajina Square. Photos by small SCALE

The festival also confirmed and extended the pedagogical model: students moved beyond the design and construction of physical space into the design of communicative strategies, developing capacities for environmental advocacy that conventional architectural education does not cultivate. The multidisciplinary and multimedia character of the festival combining mapping, performance, installation, exhibition, and public dialogue demonstrated that the protection of urban ecological systems requires precisely this breadth of approach.

4.3. "Vrba Is Neither a Construction Site - nor a Trash Can" (2025): Civic Monitoring as Environmental Advocacy

4.3.1. Context

On 23 June 2025, heavy machinery appeared in the active bed of the Vrba River in Banja Luka. Without permits, environmental impact assessment, or any form of public consultation, municipal authorities initiated construction works within the riverbed: embankments were constructed, sections of the bed were paved with concrete, and the channel was narrowed at several points [20]. The ecological consequences were immediate and measurable: channel narrowing increased flood-period water velocities, embankment construction destroyed riparian habitat, and concrete paving eliminated the substrate diversity required for aquatic and semi-aquatic species.

The core problem, however, extended beyond the physical construction itself. The modifications proceeded in a condition of institutional invisibility: spatially, because construction took place in areas peripheral to regular pedestrian movement; temporally, because incremental modifications resisted dramatic media representation; and institutionally, because decisions remained confined to administrative channels inaccessible to the public [20]. This invisibility must be understood within the broader context of post-socialist Banja Luka, where environmental regulation exists formally but functions weakly, and where spatial decisions are frequently presented as political achievements rather than outcomes of democratic deliberation [5]. Without visibility, meaningful public deliberation is impossible. The campaign that followed responded directly to this condition.

4.3.2. Process

Recognition of the problem emerged organically through distributed observation: citizens posted photographs on social media, environmental activists began documenting construction, and informal conversations circulated across civic and professional networks. Students who had participated in previous APLE Lab activities recognised the construction as a continuation of a broader pattern of spatial decisions proceeding without public consultation.

By early July 2025, an informal coalition had assembled spontaneously: architecture students interested in visual communication, civic organisations documenting regulatory violations, environmental activists concerned about ecological damage, and faculty facilitating experimental engagement. This coalition operated through a Viber community of 27 participants, functioning as an informal community of practice [17] without hierarchy or institutional mandate. It adopted the name *Diverzanti* (The Subversives), signalling a deliberate stance toward institutional opacity.

An intensive collaborative workshop convened in mid-July 2025, bringing together twenty architecture students with faculty facilitators and partner organisations including the civic initiative *Za plan*, the Centre for Spatial Research, the Centre for Environment, and the Helsinki Committee for Human Rights. Students formed working groups organised around distinct visual modalities - animation, illustration, technical drawing, data visualisation, and photomontage - and engaged in structured strategic dialogue: which audiences need to understand this problem, and which visual forms will best support their comprehension [20]?

4.3.3. Interventions

On 22 August 2025, seven visual interventions were released simultaneously across multiple platforms coordinated through partner organisations. Each embodied a different representational strategy, targeting a different constituency through a distinct visual register [20]:

Fish Walk (Ribe na suvom) - an animated video employing a river-level perspective and tragicomic register - positioned public audiences within the affected environment through anthropomorphised fish confronting riverbed degradation, achieving 1,900 views and 156 shares.

Mad Scientist (Ludi naučnik) - a video using sarcasm and exaggeration - reached design communities and civically engaged audiences through a scientist celebrating riverbed destruction, generating 1,100 views and 141 shares.

Nature Remembers (Bager Family) - a hand-drawn illustration depicting construction equipment as destructive agents - addressed design communities and civic audiences through sharp visual critique, achieving 945 views and 94 shares.

Octopus (Hobotnica) - a GIF animation employing a dramatic register - generated emotional recognition of ecological consequence across social media platforms, reaching 1,300 views and 132 shares.

Promenade (Šetalište) - an architectural cross-section and plan drawing employing technical professional conventions - communicated the extent of riverbed modification to planning professionals and inspection authorities, achieving only 83 views but generating the most significant institutional response.

Canva Infographic - a data visualisation presenting quantitative dimensions of the construction in terms of extent, materials, and timeline - provided factual grounding for media and general audiences, reaching 826 views and 34 shares.

Bager Friendly - a photomontage employing visual irony - reached critically oriented audiences through juxtaposition of construction equipment and ecological degradation.



Figure 3: (a) Fish Walk (Ribe na suvom) (b) Mad Scientist (Ludi naučnik) (c) Nature Remembers (Bager Family) (d) Octopus (Hobotnica) (f) Promenade (Šetalište) (g) Canva Infographic (h) Bager Friendly (Bager prijatelj). Source: Diverzanti student group, APLE Lab Banja Luka, 2025.

4.3.4. Environmental and Spatial Significance

The institutional response was immediate. Municipal inspection authorities opened procedures and temporarily halted construction within days of the campaign's release - demonstrating that public documentation and visual visibility can activate regulatory mechanisms that administrative opacity had foreclosed [20]. This response confirmed a critical asymmetry: the *Promenade* technical drawing and the *Canva Infographic*, despite achieving the lowest social media engagement, generated the most significant institutional consequences, circulating through professional networks and reaching planning officials whose individual responses carried greater consequence than aggregate public attention.

However, the suspension did not last. Municipal authorities attempted retroactive legalisation through permits and environmental assessments previously omitted. When these were not approved, construction resumed on 23 September 2025, explicitly and in a state of acknowledged administrative illegality [20]. This sequence revealed the structural limits of communicative intervention: visibility is a necessary but insufficient condition for environmental protection when institutional asymmetries allow political authority to override regulatory findings.

Nevertheless, the campaign's effects extended beyond the immediate procedural outcome. The issue entered and remained active within planning circles, civil society organisations, human rights networks, and academic communities. Students sustained voluntary engagement across multiple subsequent workshops dedicated to documentation, hydromorphological analysis, and alternative intervention strategies. A second campaign addressing proposed amendments to Banja Luka's Urban Plan followed in September 2025, demonstrating that the methods and civic commitments developed through the Vrbas campaign had generated transferable capacities for ongoing environmental and spatial advocacy.

From the perspective of the cumulative framework, the 2025 campaign contributed a third and distinct layer to the progressive construction of criteria for responsible riverside transformation: not only must the Vrbas be accessible as public space and clean as an ecological system, but any intervention within its bed must be subject to transparent regulatory process, public participation, and democratic deliberation. This procedural standard, established through civic resistance rather than institutional initiative, represents the most explicitly political dimension of the cumulative argument.

5. DISCUSSION

5.1. Three Interventions, Three Layers of Environmental Criteria

The three case studies analysed in this paper are not isolated events. Together, they reveal a progressive and cumulative construction of environmental criteria along the Vrbas River in Banja Luka - criteria that were not established through formal planning instruments but through repeated acts of spatial, visual, and civic engagement over nearly a decade.

The *Banjalučki mol* established the first layer: a spatial precedent demonstrating that the Vrbas riverfront is a public asset of demonstrable value. By making a neglected stretch of the river accessible, desirable, and actively used, it generated civic identification with the riparian environment and demonstrated - through built reality rather than planning proposal - what the riverside could be. This is not a minor contribution: in a context where the river had long been treated as a margin rather than a resource, the simple act of building a wooden platform and watching it become a favourite place in the city constitutes an argument about environmental value that no regulatory document had previously made.

The Sewage Pipes Festival established the second layer: an ecological standard that the river must meet if it is to fulfil the public value the *Banjalučki mol* demonstrated. By making the sewage problem visible - spatially, performatively, and analytically - the festival transformed a normalised condition of ecological degradation into a publicly recognised problem demanding a solution. It articulated, in communicative terms accessible to non-specialist publics, that a river functioning as an open sewer is incompatible with the vision of riparian public life that the *Banjalučki mol* had embodied.

The 2025 campaign established the third layer: a procedural and democratic standard governing how any intervention in the riverbed must be conducted. By documenting illegal construction, activating inspection mechanisms, and sustaining public attention across professional and civic networks, the campaign asserted that the Vrbas riverbed is not available for arbitrary administrative or political appropriation - that any transformation of this space requires transparency, environmental assessment, and meaningful public participation. This procedural standard is the most explicitly political of the three layers, and the most directly relevant to the governance of future large-scale riverside transformation.

Together, these three layers - spatial value, ecological standard, procedural legitimacy - constitute an implicit framework of environmental criteria that any future large-scale transformation of the Vrbas riverside would need to address. They were not written into a plan or codified in a regulation. They were constructed through practice, demonstrated through built and visual interventions, and validated through public response and institutional reaction.

5.2. The Cumulative Logic and Its Limits

The cumulative logic described above - what Campbell terms "massive, small" [18] - operates through a mechanism distinct from conventional planning. Rather than proceeding from strategic vision to implementation, it proceeds from practice to precedent: each intervention establishes a spatial, ecological, or civic reference point that conditions what comes next. The sequence is not predetermined but retrospectively coherent: it is only in looking back across the decade that the progressive construction of an environmental argument becomes visible.

This retroactive coherence has both strengths and limitations. Its strength lies in its resilience: because the criteria are embedded in built reality, public memory, and civic practice rather than in planning documents, they are not easily reversed by administrative decision or political change. The *Banjalučki mol* continues to be used and valued; the sewage problem, once made visible, cannot be re-normalised with the same ease; the 2025 campaign established a documented record of institutional illegality that persists in professional and civil society networks regardless of subsequent administrative actions.

Its limitation, however, is equally significant. The cumulative construction of environmental criteria through small-scale interventions does not, by itself, produce the large-scale transformation it prepares. The Vrbas riverfront remains largely

inaccessible, polluted, and subject to arbitrary intervention. Inspection procedures were opened and closed; construction continued in administrative illegality; the wastewater treatment system remains unbuilt. The gap between the criteria established through practice and their institutional recognition and application remains wide.

This gap points to a structural condition of post-transitional urban governance that small-scale interventions alone cannot overcome: the asymmetry between the capacity of civic and pedagogical action to establish standards and the capacity of political and administrative authority to ignore them. Visual activism and urban acupuncture can make problems visible and demonstrate alternatives, but they cannot substitute for the institutional will and regulatory capacity required to implement large-scale environmental transformation.

5.3. Student Pedagogy as Environmental Practice

Across all three case studies, the student workshop emerges as the primary organisational and methodological unit. This is not incidental. The workshop format - combining research, design, construction or visual production, and public engagement within a compressed timeframe and outside conventional curricular structures - creates conditions for the kind of authentic, consequential learning that Freire, Schön, and Wenger identify as the basis for genuine professional and civic development [15, 16, 17].

Students who participated in these workshops did not merely acquire technical skills. They developed strategic communicative capacity, civic commitment, and an understanding of environmental problems as simultaneously spatial, ecological, political, and pedagogical. The sustained voluntary engagement documented across all three cases - students returning for subsequent workshops, initiating new campaigns, and transferring methods to new contexts - suggests that the pedagogy generated forms of environmental consciousness that extend beyond any individual project.

This finding has implications for architectural and engineering education more broadly. Environmental protection in post-transitional contexts requires practitioners capable of operating across institutional boundaries, communicating with diverse publics, and sustaining engagement under conditions of uncertainty and institutional resistance. These capacities are not developed through conventional technical training. They require pedagogical frameworks that position students as agents rather than recipients - frameworks of the kind that the small SCALE and APLE Lab models represent.

5.4. Towards Large-Scale Riverside Transformation

The argument developed in this paper is ultimately prospective. The three interventions analysed here are significant not only for what they achieved but for what they prepared. The Vrbas riverside in Banja Luka remains a largely unrealised urban potential - a corridor of exceptional landscape, ecological, cultural, and historical value that formal planning has consistently failed to integrate into the life of the city [2, 3, 5].

When large-scale transformation of this corridor eventually becomes a political and institutional possibility, the criteria for what such transformation should look like will not need to be constructed from scratch. They have been built, incrementally and through practice, over nearly a decade of student-led intervention. A riverside that is publicly accessible and spatially valued; a river that is ecologically clean and free of untreated sewage; a planning process that is transparent, participatory, and legally grounded - these are not abstract planning aspirations. They are standards demonstrated, demanded, and defended through the cumulative body of work this paper analyses.

In this sense, the small-scale interventions along the Vrbas function as more than independent acts of environmental protection. They function as the advance work of responsible large-scale transformation: establishing its criteria, building its constituency, and holding its future implementation accountable to a set of spatial, ecological, and democratic standards that have already been publicly tested and validated.

6. CONCLUSION

This paper set out to ask whether student-led small-scale physical interventions and visual activism can progressively build the spatial, pedagogical, and civic foundations necessary for environmentally responsible riverside transformation. The qualitative analysis of three interrelated initiatives along the Vrbas River in Banja Luka, spanning nearly a decade, suggests that the answer is affirmative - with important qualifications.

The *Banjalučki mol* (2017), the Sewage Pipes Festival (2021), and the "*Vrbas is Neither a Construction Site - Nor a Trash Can*" campaign (2025) each contributed a distinct and irreplaceable layer to a cumulative framework of environmental criteria. The first demonstrated the public value of riparian space through built reality. The second made a normalised ecological crisis visible and transformed it into a subject of civic demand. The third established the procedural and democratic standards that any future intervention in the riverbed must meet. Together, they constitute an implicit environmental argument - not codified in planning documents, but embedded in spatial practice, public memory, and civic commitment - that defines what responsible large-scale transformation of the Vrbas riverside should look like.

Several conclusions follow from this analysis. First, small-scale interventions are not merely compensatory responses to the failures of formal planning. When strategically sequenced and analytically connected, they perform a generative function: establishing precedents, articulating standards, and building the civic constituency that large-scale transformation requires. Second, visual activism and urban acupuncture are complementary rather than alternative strategies: physical interventions establish the spatial value of an environment, while visual interventions make its ecological and procedural

conditions legible to diverse publics. Their combination produces a more complete environmental argument than either could generate alone. Third, the student workshop – as an organisational form positioned outside conventional curricular structures – proves capable of generating both spatial outcomes and forms of civic and professional development that conventional technical education cannot cultivate.

At the same time, the analysis confirms a structural limitation that small-scale interventions cannot overcome alone. The cumulative construction of environmental criteria through practice does not, by itself, produce institutional transformation. The gap between the standards established through civic and pedagogical action and their recognition and application by political and administrative authority remains the central challenge of environmental governance in post-transitional contexts. Closing this gap requires not only the continued accumulation of small-scale precedents but the development of institutional mechanisms capable of translating civic standards into binding planning obligations.

The broader implication is significant for both environmental practice and architectural education. In contexts characterised by institutional fragility and weak regulatory enforcement, the protection of urban ecological systems depends on the gradual construction of civic and spatial knowledge about what those systems can and should be. Student pedagogy, when oriented toward real problems and real communities, is a primary vehicle for this construction. The cases examined here suggest that architecture and engineering education has a role in environmental protection that extends well beyond the technical – one that is spatial, communicative, civic, and ultimately political.

The Vrbas riverside in Banja Luka remains a largely unrealised urban potential. But the criteria for its responsible transformation have already been built. They are waiting.

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