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Reframing Urban Ecological Space Toward Systemic Ecological Thinking

Abstract

Urban ecological space has become a central concern in contemporary urban discourse, yet it continues to be approached predominantly through fragmented, function-oriented interventions. Green spaces are commonly framed as discrete amenities or technical infrastructures, rather than as integral components of relational urban ecological systems. This condition reflects not only spatial fragmentation, but a deeper conceptual rupture in how urban ecology is understood and sustained. This paper argues that the limitations of prevailing urban ecological practices stem less from insufficient ecological performance than from the absence of systemic ecological thinking. By isolating ecological functions from their relational, perceptual, and socio-cultural contexts, dominant green-space paradigms struggle to support long-term ecological continuity and regeneration. The study advances a conceptual reframing of urban ecological space as a systemic condition rather than a collection of spatial elements. The argument is grounded in the author's doctoral research and informed by long-term spatial observation and interpretive analysis of urban ecological systems. This grounding supports theoretical synthesis rather than empirical generalisation. Building on this foundation, the paper articulates systemic ecological thinking as a conceptual framework through which urban ecological space is understood as relational, continuous, and perceptually mediated. Within this reframing, regenerative aesthetics is proposed as a mediating logic that links ecological processes, lived experience, and social continuity, offering a pathway for understanding ongoing ecological regeneration at the urban scale.

Keywords: *Ongoing ecological regeneration*; *Urban ecological systems*; *Regenerative aesthetics*; *Systemic urban regeneration; City systems thinking.*

Core Challenge

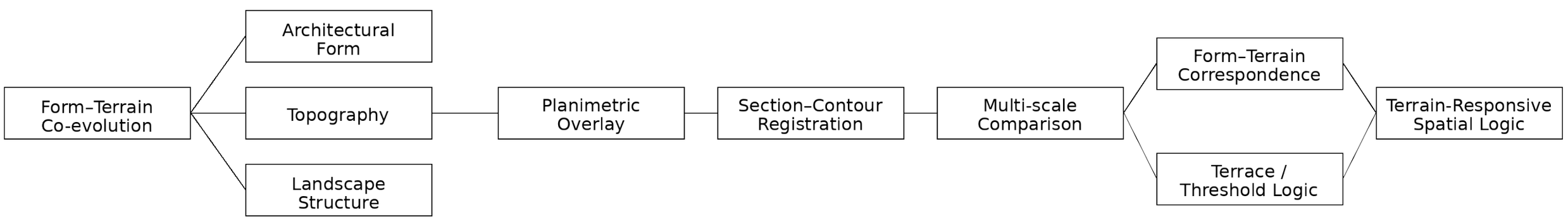
Urban ecological space is still treated as fragmented, function-oriented "amenities" instead of integrated components of relational urban ecological systems. This leads to discontinuous, unsustainable urban regeneration.

Core Proposition

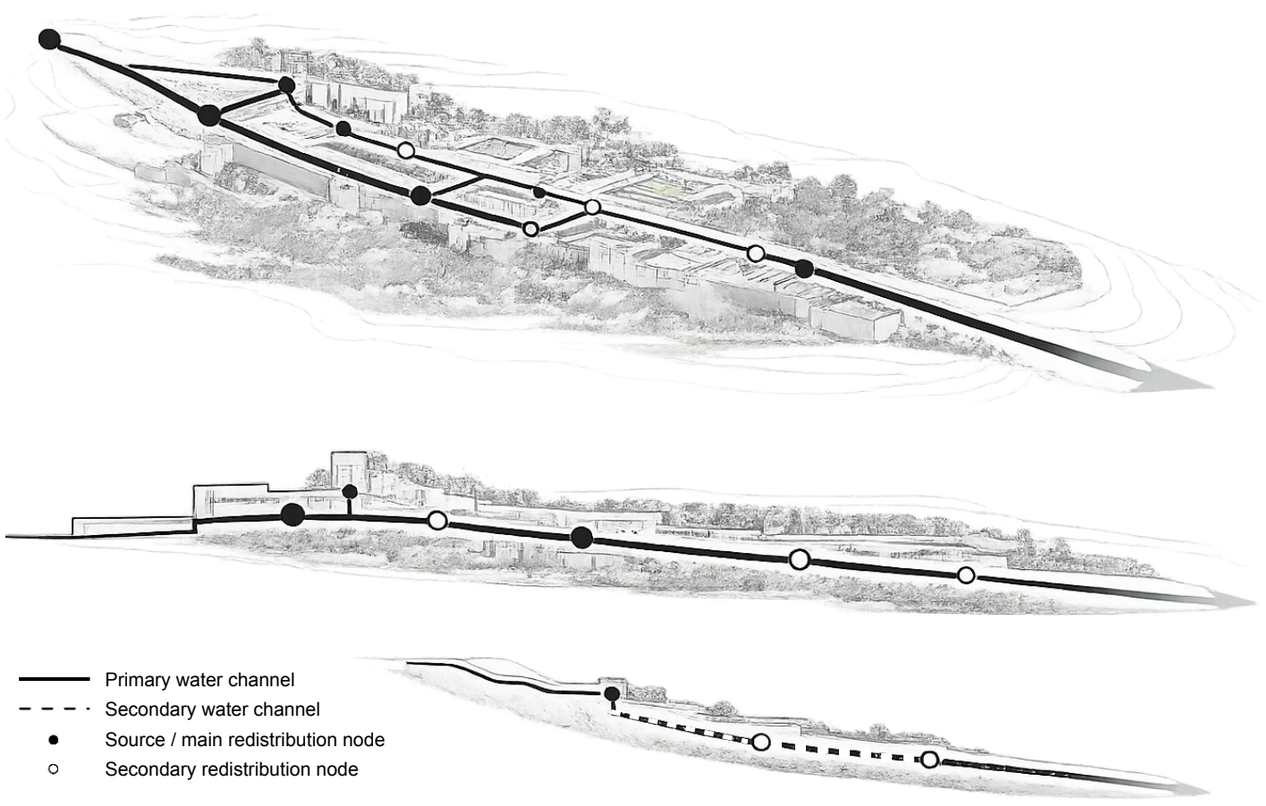
Systemic ecological thinking, paired with regenerative aesthetics, can reframe urban ecological space as a continuous, relational system, linking ecological processes, lived experience, and social continuity.

Methodological Framework

This study combines morphological, hydrological, and perceptual analysis to unpack systemic ecological relationships in urban space.



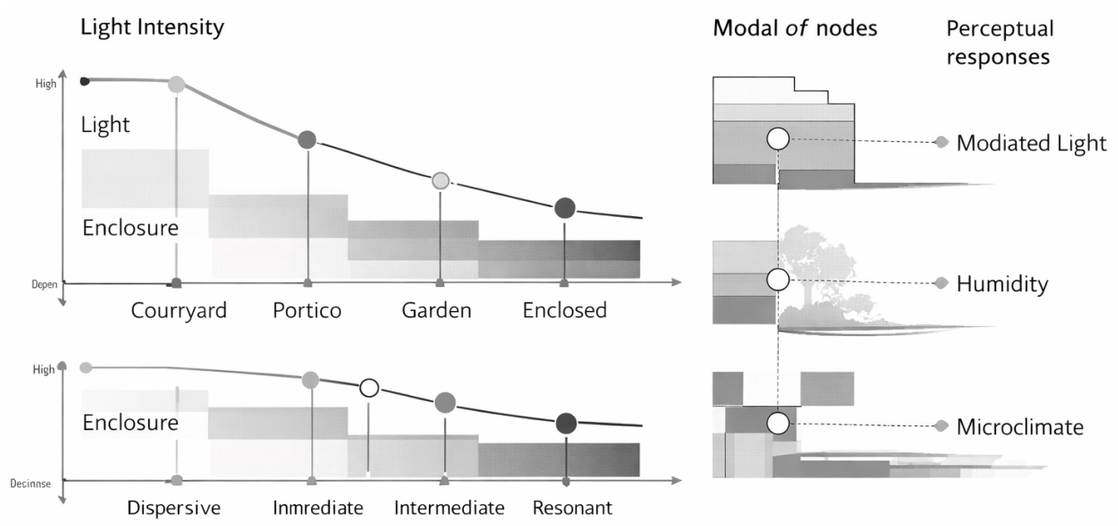
Form-Terrain Co-evolution Mapping (*Figure 2.2-1*)
Urban ecological space is shaped by the reciprocal relationship between architectural form, topography, and landscape structure.



Hydrological System Integration *(Figure 2.3-1)*
Water systems act as structuring agents, creating gravity-fed ecological networks that embed ecological continuity into the urban fabric.

Spatial Segment	Mean Illuminance (lux)*	Acoustic Condition (RT60, s)*	Enclosure Ratio (H/W)*	Vegetation Coverage (%)*	Water Presence (type)
Courtyard A → Portico	3,000–6,000 (filtered)	0.8–1.2	0.6–0.8	~35–45	Fountain + channel
Portico → Garden	1,500–3,000	1.0–1.5	0.4–0.6	~50–65	Irrigation only
Enclosed Chamber	300–700	1.8–2.4	>1.2	<10	None

Perceptual & Environmental Correlations *(Table 2.4-1)*
Spatial enclosure, light intensity, and vegetation coverage shape human experience, which mediates engagement with urban ecology.



Sequential Perceptual Variation. *(Figure 2.4-1)*
Perceptual responses (light, humidity, microclimate) are modulated by the spatial sequence, creating a continuous ecological experience.

Key Findings

1. Urban ecological space operates as a **systemic continuum** rather than discrete green patches. Spatial elements (water, vegetation, topography) are not isolated amenities but interconnected components that maintain ecological flow and continuity across the urban fabric.
2. **Regenerative aesthetics acts as a critical mediating logic** between ecological processes and human perception. It translates invisible ecological functions (hydrological cycles, microclimate regulation) into tangible, lived experiences, fostering sustained engagement with urban ecology.
3. **Ongoing ecological regeneration demands relational, context-specific thinking**, rather than one-off, episodic interventions. Success depends on designing for dynamic ecological relationships and place-specific conditions, not applying generic "best practice" solutions.

Future Outlook

Shifting from fragmented, function-oriented design to **systemic ecological thinking** is critical for building resilient, socially inclusive urban ecological systems. This framework offers a pathway to embed ecological continuity into future city systems.

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