



A Conceptual Framework for the Relationship Between Terrain Vague and Urban Ecology

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ABSTRACT

While post-industrial cities generate global environmental issues as centers of intensive production, consumption and waste; the continuous dynamic of urban transformation creates fragmentation within the urban fabric, inevitably producing residual spaces. Although these sites, conceptualized by Ignasi de Solà-Morales as "*terrain vague*", are often perceived as undefined, abandoned or obsolete zones, they hold the potential to contribute to urban resilience. This study conceptualizes the socio-ecological functions of these spaces by reinterpreting *terrain vague* from the perspectives of architectural theory and urban ecology. A qualitative content analysis of selected literature was conducted. Recurring conceptual themes were systematically coded using MAXQDA software and classified into five main categories—spatial, urban, liminal, social and ecological characteristics. By analyzing category overlaps and conceptual connections, a holistic conceptual framework regarding the relationship between *terrain vague* and urban ecology was established and visualized. Findings indicate that *terrain vague* represents not only physical voids but also dynamic ecosystems that enhance biodiversity, enable alternative public uses and support spontaneity. The study demonstrates that *terrain vague* serves as a conceptual bridge between architectural theory and urban ecology, constituting a reference for sustainable, resilient urban design strategies.

Keywords: urban void, residual space, urban nature, hybrid ecosystem, architectural theory, post-industrial cities

INTRODUCTION

Cities, as sites of intense production, consumption and waste, are regarded as the world's "hotspots", leading to global environmental problems (Grimm et al., 2008). These issues, emerging alongside the Industrial Revolution, have rendered urbanization unsustainable (Wu, 2014). Furthermore, rapid pace of industrialization and urbanization, coupled with deindustrialization since the mid-20th century, has transformed cities, generating fragmentation within the urban fabric and produced leftover spaces. Consequently, abandoned industrial sites, infrastructural voids and interstitial areas have become visible components of the contemporary urban landscape (Berger, 2006; Kamvasinou & Roberts, 2014).

Such undefined areas were conceptualized by architectural theorist Ignasi de Solà-Morales (1995) as "*terrain vague*". The concept approaches urban voids not merely as physical leftovers, but also as the "other spaces" of the city's defined image. Lying outside the formal urban system yet maintaining a dialectical relationship with it, these spaces harbor latent potential. Barron (2014) further describes *terrain vague* as an umbrella term, encompassing vacant lots, disused industrial sites and the interstitial areas of the city.



While often discussed in social terms, *terrain vague* holds significant ecological potential. Due to the lack of intervention, these areas support spontaneous vegetation and provide habitats for non-human species (Clement, 2011; Kowarik, 2005). In this sense, they can be regarded as unique ecosystems reflecting the hybrid character of contemporary cities. This research adopts an urban ecological approach that views cities as “socioecological systems” (Grimm et al., 2008) where cultural and natural processes interact (McDonnell, 2011). Moving beyond the nature–culture dichotomy, this approach evaluates *terrain vague* in relation to urban form transformation and its socio-ecological impacts. Within this framework, the potential contributions of these spaces are discussed in light of urban ecology’s goal of creating sustainable, resilient, and healthy urban environments (Alberti, 2008; Karadağ, 2009; Pickett et al., 2004; Wu, 2014).

Felson and Pickett (2005) highlight those ecological approaches can guide design strategies, while architectural and landscape projects can serve as experimental settings for ecological research. In this context, the ecological potential of *terrain vague* offers an opportunity to establish a conceptual bridge between architectural theory and urban ecology. Accordingly, the main research question of this article is formulated as: “What kinds of socio-ecological functions can *terrain vague* assume within urban ecosystems?”

This study seeks to re-examine the concept of *terrain vague* through an urban ecology perspective and to establish a conceptual framework. To this end, selected literature was analyzed through a qualitative content analysis approach and a new conceptual framework was proposed within the scope of architectural theory based on the themes identified.

AN URBAN ECOLOGICAL PERSPECTIVE ON *TERRAIN VAGUE*

The literature review presented below is organized to support the methodological structure of the study, which is based on qualitative content analysis. In this context, the theoretical development of the concept of *terrain vague* is first examined, followed by an overview of the fundamental principles of urban ecology and an exploration of the points at which the two fields intersect.

Theoretical Background of *Terrain Vague*

Architect and theorist Ignasi de Solà-Morales (1995) conceptualized the term *terrain vague*, within the field of architecture, defining urban voids not merely as physical residues but as the city’s “other” spaces maintaining a dialectical relationship with the city’s defined image. By highlighting their latent potential, as places where the city’s alternative is reflected in its “negative image”, he suggests that within their indeterminacy, established norms and control are suspended, thereby allowing various forms of freedom, critique, and creativity to emerge.



Figure 1. *Le Terrain Vague Note*. From *Le Terrain Vague* [Gelatin silver print], by Man Ray, 1932, The Museum of Modern Art, New York (<https://www.moma.org/collection/works/55651>)

This theoretical ground has been expanded through focus on the experiential and transgressive dimensions of such spaces. The art collective Stalker (1996) posits that confronting directly with these “actual territories” reveals the city’s unseen truths, while Gil Doron (2000) emphasizes their “transgressive” nature, ironically signifying them as “dead zones”, where the limits of architecture dissolve but various forms of nature and appropriations emerge. These social and ecological potentials of *terrain vague* are attributed by Krystallia Kamvasinou (2006) to the qualities of “emptiness/openness, indeterminacy, and spontaneity,” and by Matthew Gandy (2013, 2016) to the invalidation of existing spatial norms and definitions, resulting in “unintentional landscapes”. Luc Levesque (2002, 2013), on the other hand, reframes these areas as “interstices”, spaces of physical and temporal in-betweenness, open to process and transformation, highlighting the coexistence of contradictory qualities and the material diversity generated within an intermediate state.

Furthermore, the concept introduces critical dimensions to debates on publicness. Stavros Stavrides (2014) argues that these voids can be re-spatialized through “practices of commoning”, thus establishing a direct link between emptiness, spatiality and potential publicness. Karen Franck (2014) posits that recognizing the indeterminate qualities of *terrain vague* enriches the understanding of how human activity constitutes public space. On a more radical level, Francesco Careri (2014) characterizes them as “nomadic” spaces standing in opposition to modernity, acting as a spatial critique of the capitalist city. Similarly, Matthew Gandy (2013, 2022) defines these “marginal landscapes” as “counter-hegemonic” grounds, capable of disrupting normative structures and generating new socio-spatial relations.

Finally, Patrick Barron (2014) broadens the scope by positioning *terrain vague* as an umbrella term, encompassing various forms of leftover urban land, elucidating their socio-ecological potentials through concrete typologies. Collectively, these approaches demonstrate that *terrain vague* signifies not merely physical emptiness, but a site of

potential productivity and alternative publicness. A systematic summary of these key definitions is provided in Table 1.

Table 1. Prominent Definitions of *Terrain Vague*

Author/ Year	Definition	Context
Ignasi de Solà-Morales (1995, 1997)	First use of the concept in architectural context; one of the fragments of the post-industrial city; areas of "mentally exterior in the physical interior of the city"; "empty, abandoned areas"; "refuges" within the city for creative actions.	Architecture and Urban Theory: A new conceptual approach to the relationship between urban leftover spaces and the city and to their various potentials
Stalker (1996)	"Actual territories" where the city can be directly and diversely experienced	Architecture, urban experience
Luc Levesque (2002, 2013)	The notion of "interstice"; physical and temporal in-between spatial conditions; linked to processes and transformations; coexistence of contradictions; material accumulation within intermediate state	Architecture, urban and landscape theory:
Gil Doron (2000, 2007)	"Dead zones" and "zones of transgression" referring to empty, derelict and indeterminate spaces, where norms are suspended and temporal ruptures occur; spaces transgressed by nature and human actions	Architecture and urban theory
Gil Clement (2004, 2011)	"Third landscape"; abandoned areas serving as natural reserves for species	Landscape design, urban ecology, and alternative concepts of nature
Ingo Kowarik (2005)	"Fourth nature, new wilderness, urban woodlands"; abandoned industrial sites providing habitats with diverse ecological characteristics	Urban ecology and alternative concepts of nature
Alan Berger (2006)	"Drosscape"; the continuous emergence of residual spaces as a result of urban growth and processes.	Architecture and urban theory
Krystallia Kamvasinou (2006)	"emptiness/openness, indeterminacy, and spontaneity" as main qualities of terrains vague	Urban and landscape design
Sabine Hofmeister (2009)	"Second-third wilderness"; hybrid natures emerging in urban residual spaces, temporary nature simulacrum	Urban ecology and alternative concepts of nature
Matthew Gandy (2013, 2016, 2022)	"Unintentional landscapes/marginal spaces"; social and ecological spaces formed outside of planning, challenging conventional norms	Urban ecology, urban nature, urban development policies and landscape concepts
Patrick Barron (2014)	An umbrella term for various types of leftover land; "seemingly abandoned or overgrown sites"; "areas found within the margins and interstices of cities"; "vacant lots, derelict industrial sites, or unkempt border areas."	Architecture and urban theory
Stavros Stavrides (2014)	"Threshold spaces"; spaces without content, where the spatiality is constituted by social practices	Architecture theory, social practices and debates on publicness
Francesco Careri (2014)	"Nomadic voids" that are part of the urban system; nomadic public spaces, opposing modernity	Architecture and urban theory
Karen Franck (2014)	Existing public uses in terrains vague; ambiguous qualities present in public spaces	Architecture theory, urban open areas and debates on publicness

As observed, the concept of terrain vague, within the architectural context, was conceptualized by Solà-Morales in 1995 as a framework where the urban wastelands' ambivalent connections with the city, their conflicting characteristics, the potential underlying them and the uncertainty created by all of these elements, form overlapping, intersecting, contradictory layers of meaning. Over the years, various theorists have engaged with the concept on a theoretical level, exploring its multiple dimensions, including emptiness, in-betweenness, ambiguity, spontaneity, public and ecological values, thereby elaborating and expanding its multilayered structure.



Urban Ecology and the Socio-Ecological Potentials of *Terrain Vague*

Emerging as an independent field in the 1970s, urban ecology has evolved from early biological studies of urban flora and fauna into an interdisciplinary domain (McDonnell, 2011) that views cities as "complex socioecological systems" (Grimm et al., 2008). Departing from conventional approaches that define the city as separate from nature, contemporary urban ecology conceptualizes the city as a "hybrid ecosystem" where human activities, cultural values, and natural processes mutually influence and transform one another (Alberti, 2008; Pickett & Cadenasso, 2013; Wu, 2014). Within this framework, the focus shifts towards understanding the complexity of urban systems and integrating ecological processes into urban planning to maintain biodiversity, enhance resilience and address global environmental challenges (Ahern, 2012; Niemela, 1999; Pickett et al., 2004; Wu, 2014).

From this perspective, *terrain vague* holds significant potential due to its position at the intersection of socio-cultural and natural processes. Rather than being viewed as empty, these unmanaged areas are understood as "disturbed" or "ruderal" sites that foster spontaneous vegetation and high species diversity (Alberti, 2008; Ahern, 2012; Niemela, 1999; Sukopp & Werner, 1983). This inherent hybridity allows them to function as unique "artificial natures" (Solà-Morales, 1995), "cyborgian landscapes" (Doron, 2000), "third landscapes" (Clement, 2004) or "fourth nature" (Kowarik, 2005), where the nature-city distinction dissolves. Beyond serving as refuges for migratory species and distinct "urban woodlands" (Gandy, 2022; Kowarik, 2005), these voids provide critical ecosystem services, such as stormwater management, soil remediation, and climate change mitigation, thereby contributing to urban resilience (Mathey et al., 2015; Spirn, 1985).

The ecological capacity of *terrain vague* is intrinsically linked to its social dimensions. The lack of surveillance in such overlooked areas enables not only illicit uses but also creative actions, informal sheltering, and gardening (Barron, 2014; Foster, 2013; Kullmann, 2014; Solà-Morales, 1995, 1997). As "marginal places," they provide opportunities for spontaneous, "non-design" experiences, in contrast to formal parks (Gandy, 2022) and foster bottom-up public uses that enhance social flexibility (Kamvasinou & Roberts, 2014). Recognizing these qualities could guide new design strategies, ranging from "vague parks" (Kamvasinou, 2006) and "thin parks" (Kullmann, 2011) and integrating these voids into the city's green infrastructure to deliver ecosystem services (Mathey et al., 2015). Ultimately, through cultivating their public and ecological potential, such spaces could serve as catalysts for the 'post-post-industrial era', enabling the transition toward a new hybrid city model referred to as "sixth nature" (Desimini, 2014).



Figure 2. A railroad artifact, 30th St note. From a railroad artifact, 30th St [Photograph], by J. Sternfeld, 2000. Friends of the High Line
(https://www.thehighline.org/photos/historical/?gallery=5146&media_item=2744)

METHODOLOGY

This research was conducted with the aim of analyzing the relationship between the concept of *terrain vague* and urban ecology at a theoretical level. Given the multilayered, ambiguous and interdisciplinary nature of the concept, qualitative content analysis, offering contextual interpretation, was selected as the methodological approach. This method enables systematic examination of conceptual structures, recurring themes and relationships within textual data (Mayring, 2014). Through this approach, the social and ecological potentials of *terrain vague* are highlighted within the context of urban ecosystems.

The study is based on a theoretically grounded content analysis and does not include empirical field data. While this limits the direct observation of *terrain vague* in physical and social contexts, it provides an opportunity to assess the conceptual depth and interdisciplinary connections of the term more comprehensively.

Research Approach

Since its introduction by Ignasi de Solà-Morales, the concept of *terrain vague* has been discussed within various disciplines, including architecture, urban theory, landscape studies and ecology. Hence, qualitative content analysis was employed to reveal the theoretical layers of the concept and its relationship with urban ecology was structured through these layers.

Data Source and Sample List

The data source of the study consists of international academic publications on *terrain vague* and urban ecology. The following criteria were defined for sample selection:

1. Theoretical or applied studies that examine the concept of *terrain vague* and studies focusing on its potential within the context of architecture, urban and landscape design
2. Studies that discuss the socio-ecological potential of wastelands within the context of urban ecology

The selected texts were examined through the content analysis process according to their contextual relationships and their conceptual contributions and evaluated in a manner, supporting the construction of a theoretical framework for *terrain vague*. The complete list of the documents included in the qualitative content analysis is provided in Appendix 1.

Analysis Process and Category Development

Within the scope of this research, the textual data related to the *terrain vague* phenomenon was analyzed using content analysis, to reveal relational embedded contextual and semantic layers. Güçlü (2021) describes the data analysis process simply as "coding." Raw data is first segmented, then organized into conceptual units and finally "integrated into theory."

Guided by Mayring (2014), coding was conducted as a systematic process of applying categories to text segments within their context. To uncover the multilayered structure of the concept and reinterpret it within the context of urban ecosystems, the analysis was executed in three interlinked stages:

- **Coding:** Descriptive statements regarding the foundational qualities of *terrain vague* were identified and coded according to their contextual setting, forming preliminary codes.
- **Category Formation:** Initial codes were clustered into five overarching categories based on thematic similarity, specifying the qualities of *terrain vague* in a broader framework.
- **Conceptual Framing:** The frequency of each category and the relationships among categories were analyzed to propose a unique conceptual framework illustrating how *terrain vague* contributes to urban ecology.

To ensure systematic execution of the analysis, the process was conducted using MAXQDA software, which allowed the detailed examination of texts, immediate coding of text segments, enabled tracking the frequency of categories, their interrelationships, overlaps and visualization of the results in graphic form.

Although there were no predefined categories, recurring attributes associated with *terrains vague* in the literature guided the establishment of preliminary codes. The resulting conceptual codes and their contextual layers are detailed in Table 2.

Table 2. Categories Identified for *Terrain Vague*

	Context/Layer	Core categories
Negatively perceived attributes	Spatial	Empty
		Indeterminate
		Irregular
	Urban	Other
		Residual
Potential	Liminal	In-between
		Juxtaposition
	Social	Informal use
		Urban memory & critique
		Aesthetic experience
		Ecological research
	Ecological	Urban nature
		Hybrid

Following the initial stage of coding, the interrelations among codes were examined and initial codes were organized into main categories based on thematic recurrences (see Table 2).

- Spatial Qualities: Due to their causal interconnections and their shared role in describing the physical-functional void and disordered, undefined characteristics of *terrain vague*, codes such as *empty*, *irregular* and *indeterminate* were grouped under this category.
- Urban Qualities: Highlighting the dialectical relationship with the city, codes like *other* and *residual* were consolidated to reflect the ambivalent position of *terrain vague* within the urban fabric.
- Liminal Qualities: Guided by Lévesque's (2002) conceptualization, codes referring to *in-between* conditions and material *juxtaposition* of *terrain vague* were grouped under this category.
- Social Qualities: Given the interplay between emptiness, indeterminacy and freedom which are evident in spontaneous and temporary uses in such spaces, codes relating to *informal use*, *aesthetic experience*, and *urban memory* formed this category, acknowledging the human role in urban ecosystems.
- Ecological Qualities: Emphasizing the ecological significance of these spaces for non-human species as natural refuges (Gandy, 2013), codes reflecting *urban nature* and *hybrid ecosystems* were grouped under ecological this category.

FINDINGS

Within the scope of this study, codes derived from the analysis of the texts, should be regarded as conceptual indicators that define *terrain vague's* various aspects. The organization of these codes into a hierarchy of sub and main categories constituted the first step in identifying the vertical relationships among concepts. The subsequent step involved determining the horizontal relationships between categories. Moreover, to detect connections not directly observable during analysis, the frequencies of codes and their overlaps were examined quantitatively.

Considering the distribution of preliminary codes (Figure 3), it appears that *terrain vague* is predominantly defined as physical-functional voids in spatial terms and as residual/by-product elements of space production processes in the urban context. Thus, the relationship between these voids being outside the urban order as "other spaces" and simultaneously being by-products of the same processes becomes evident.

Regarding the distribution of social and ecological attributes of *terrain vague*, providing space for spontaneous and informal activities emerges as the most significant social contribution, while the creation of urban nature reserves stands out as an ecological contribution. Consequently, since these places are empty and abandoned, the limits of architecture and planning are "transgressed", allowing them to be 'transgressed' by human and non-human agents (Doron, 2000, 2007). Looking at the frequency of main categories, social and spatial qualities are found to be dominant. Overall, the consistency between sub and main categories indicates that the emptiness of *terrain vague*, along with its social and ecological potential, occupies a central position in the conceptual understanding of the phenomenon.

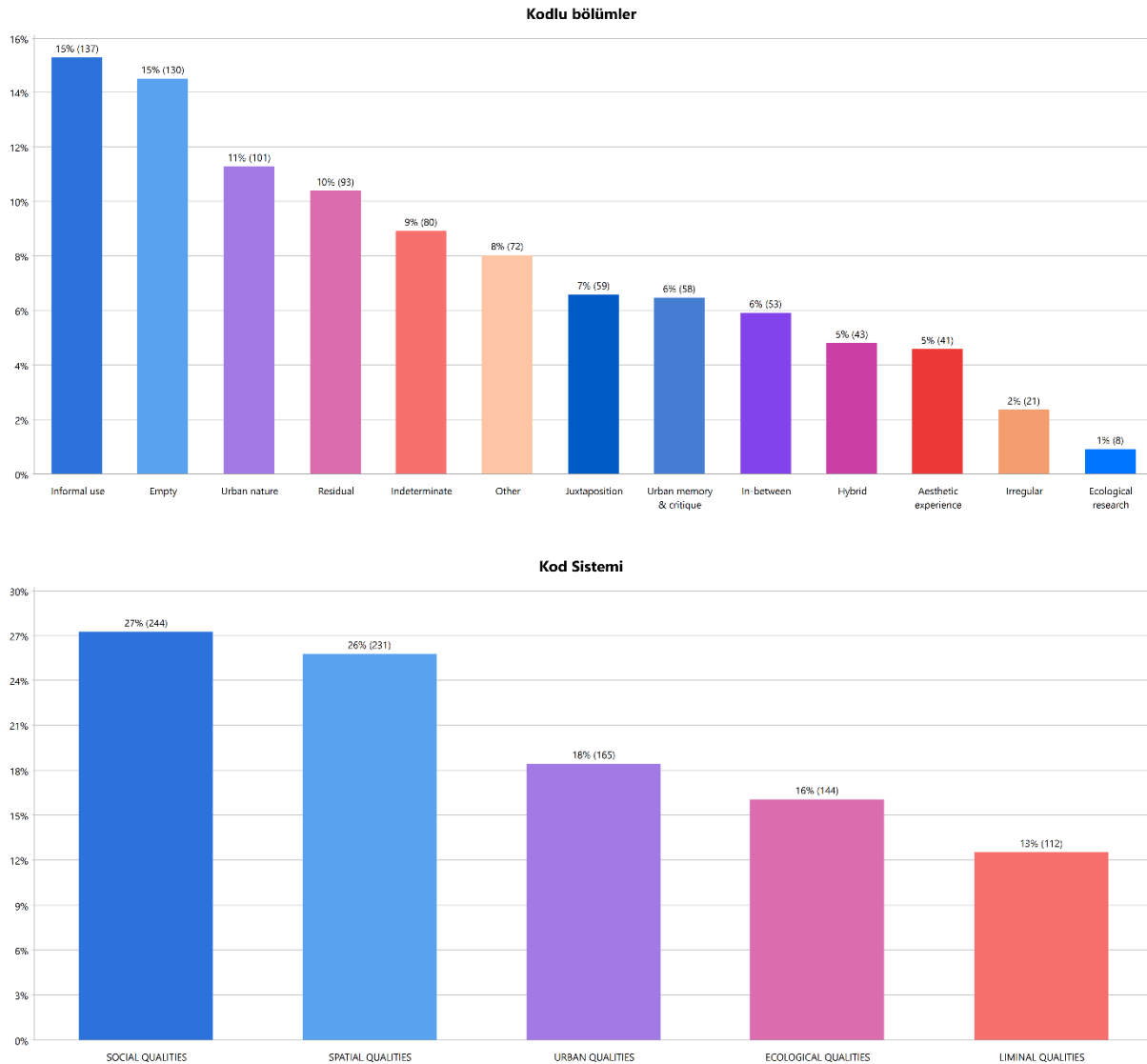


Figure 3. Frequencies of sub and main categories (Created by the authors)

To further clarify the structural connections, code overlaps and their frequencies were examined. Thematic relationships among sub-categories are presented in Figure 4, which illustrates the extent of intersecting semantic domains and how the multi-layered structure of the concept forms a pattern. Examining the connections among codes (Figures 4 and 5), a clear pattern of relationships can be identified between *emptiness* and *indeterminacy* in spatial dimension, *otherness* and *residual* in the urban context, *informal use* and *urban nature* in socio-ecological terms. Moreover, the condition of *otherness* appears to be interconnected with *juxtaposition* and *hybridity*.

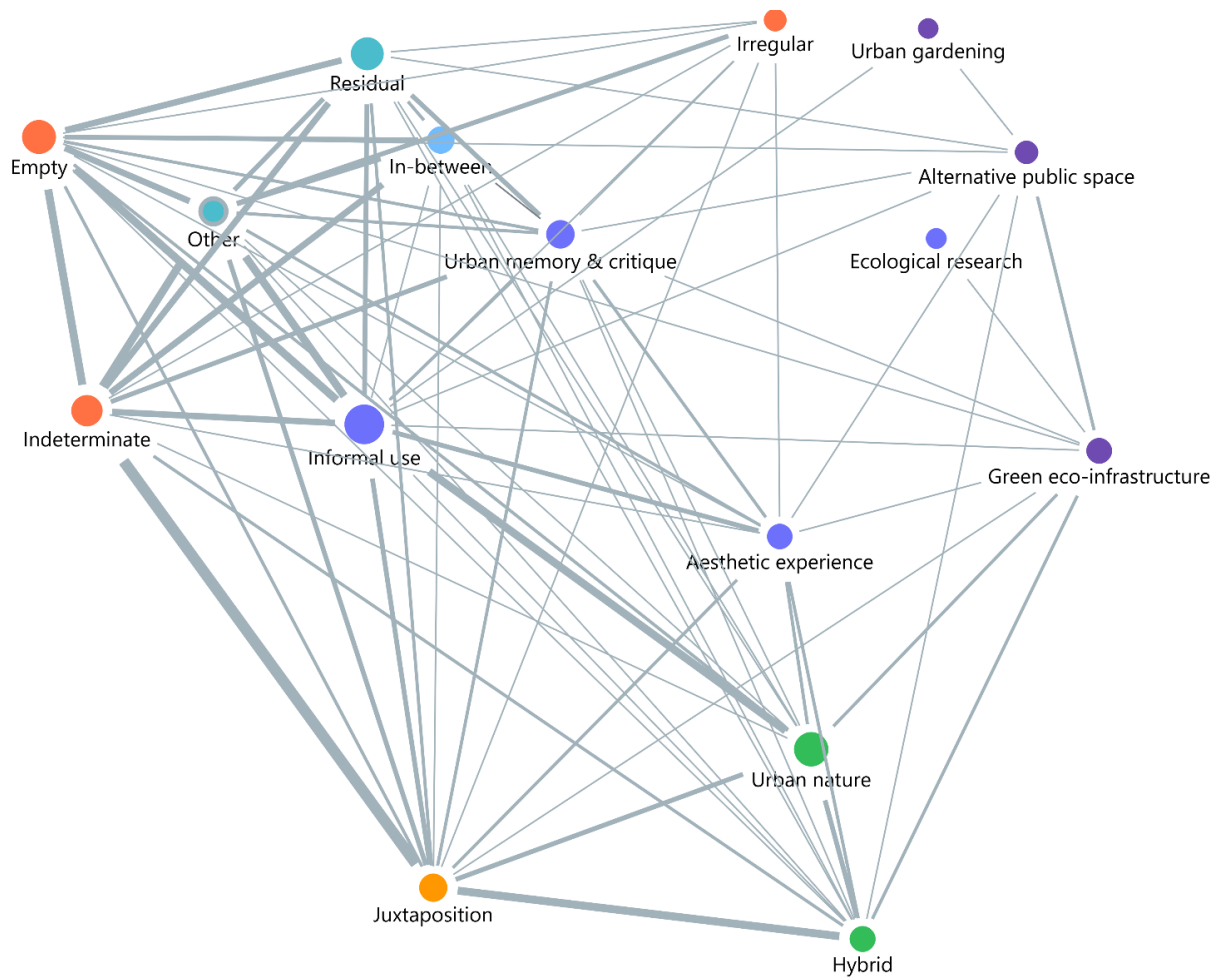


Figure 4. Conceptual code map referring to the interrelations among codes (Created by the authors)

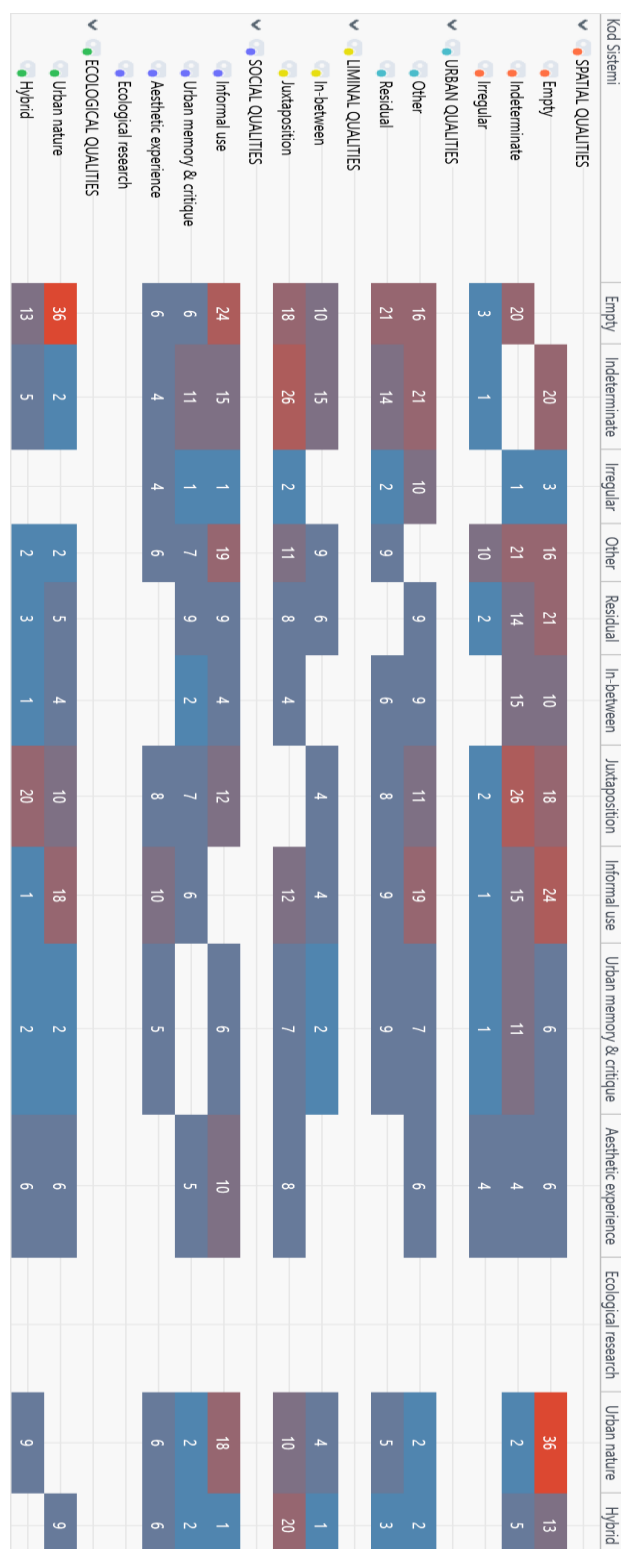


Figure 5. Relationships among sub-categories: Intersections of code frequencies, revealing conceptual layers and thematic overlaps (Created by the authors)

DISCUSSION: A SOCIO-ECOLOGICAL CONCEPTUAL FRAMEWORK

Based on the findings, conceptual pattern concerning the phenomenon of *terrain vague* emerges when the overlaps between categories are interpreted. *Empty*, *irregular* and *indeterminate* constitute the abstract spatial qualities of these areas, interconnected through a cause-effect relationship: the condition of *emptiness* renders these areas devoid of clear spatial characteristics, leaving them in a state of *indeterminacy*. In the urban

context, it becomes apparent that spaces characterized as empty and uncertain are positioned as *other*, outside or at the margins of what represents the urban order. However, the underlying causes of this *otherness* should be sought in the transformation processes of the city itself. From this perspective, *terrain vague* can also be defined as a morphological phenomenon: the continuous formation of urban form produces *residual spaces*, creating *intervals* within the city's physical and temporal continuities. Within these indeterminate boundaries, processes emerge that differ from the city's dynamics, possessing their own internal rhythms; where a variety of objects, humans, non-human species, experiences, activities accumulate. The *juxtaposition* of these differences and contradictions continually reproduces the vagueness of such spaces, while simultaneously constituting their socio-ecological potential. In this sense, the suspension of urban norms provides open and flexible environments that accommodate spontaneous, temporary and *informal activities*. Moreover, during periods of non-intervention, *terrain vague* can host spontaneous or refuge-seeking species, evolving into *hybrid ecosystems* and *urban natural reserves*, representing a crucial component of the city's ecological services and green/eco-infrastructure.

In this context, *terrain vague* emerges as a space that contributes to the urban ecosystem through its unique hybrid character, which enables alternative imaginations of the nature-city relationship. Beyond being physical location, it can be defined as a phenomenon of process. The emergence of spontaneous and temporary uses, as well as hybrid ecosystems within and following the formation of these spaces, simultaneously reflects particular sections of the city's ecological dynamics. Thus, awareness of the potential of such areas contributes to improving the socio-ecological condition of the city.

Ultimately, the phenomenon of *terrain vague* is understood to establish a conceptual ground between urban ecology and architectural theory. It enables a dialogue between ecological processes and the theoretical discourse of architecture by revealing how spatial ambiguity, informality and indeterminacy can generate alternative forms of urban ecological resilience and adaptation. This theoretical proposition, which visualizes the holistic relationship between *terrain vague* and urban ecology, is summarized in Figure 6.

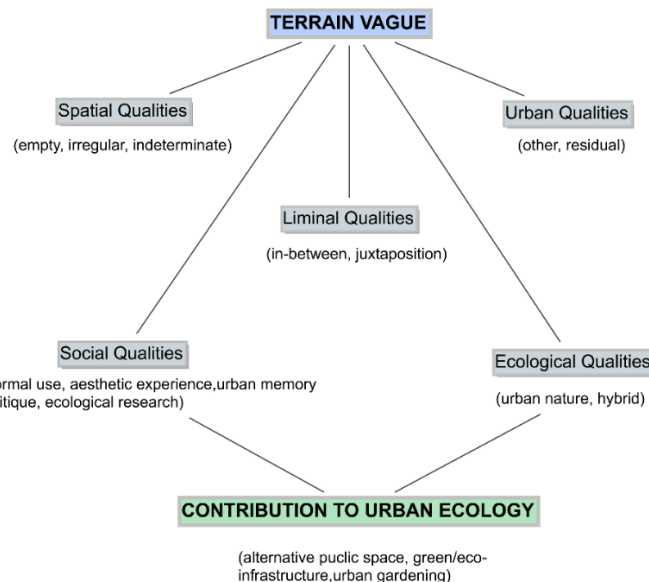


Figure 6. Conceptual diagram of terrain vague in the context of urban ecology (Created by the authors)

Solà-Morales (1995), in his seminal essay on *terrain vague*, expresses his doubts about how architecture should approach such spaces. Instead of following the city's formal structure driven by economic efficiency, he calls for attentiveness to the "flows" and "continuities" generated by voids and temporal processes. The conceptual framework



presented in this study, situated within the context of urban ecology, is hoped to contribute to the development of these very flows and continuities emphasized by Solà-Morales.

CONCLUSION

The study demonstrates that *terrain vague* should not be seen merely as urban waste, but as a dynamic component of urban ecosystems. By redefining Solà-Morales' conceptualization within an ecological framework, it reveals that the core characteristics of these spaces, *emptiness*, *indeterminacy* and *otherness* enable a unique state of *liminality* that fosters both ecological resilience and social productivity. Functioning as hybrid natural reserves, these areas constitute the city's hidden ecological infrastructure and play a critical role in maintaining the continuity of non-human life forms.

At the interdisciplinary level, the analysis establishes a mutually enriching ground between urban ecology and architectural theory. It posits that the absence of intervention creates alternative spaces of freedom for human activities while offering protected conditions for spontaneous natural processes, redefining the notion of socio-ecological systems and highlighting the productivity of "non-design" (Gandy, 2022). Consequently, the role of architecture shifts from producing functional forms to analyzing and cultivating existing potentials with minimal intervention.

Recognizing this potential opens new paths for sustainable urban and architectural design practices. Rather than imposing permanent structures, interventions should prioritize the protection of these areas as potential urban nature reserves and their integration into green infrastructure. Design strategies should focus on preserving spontaneous landscapes, utilizing existing structures with lightweight, temporary interventions, and balancing social access with biodiversity conservation.

Future research should empirically examine the effects of residual areas on urban biodiversity, microclimate regulation and social inclusivity to deepen the theoretical model. This approach will allow the socio-ecological potential of *terrain vague* to be assessed not only at a theoretical level but also in design and policy-making processes.

In conclusion, the presence of *terrain vague* within urban ecosystems represents not only an issue of reusing residual urban spaces but also a strategic opportunity for the ecological and cultural sustainability of cities. The conceptual framework presented in this study contributes to the ecological reinterpretation of concepts such as *emptiness*, *liminality* and *urban nature*, expanding the possibilities of interpreting cities as living, transforming and regenerating hybrid ecosystems.

Conflict of Interest: *The author(s) declare that they do not have a conflict of interest with themselves and/or other third parties and institutions, or if so, how this conflict of interest arose and will be resolved, and author contribution declaration forms are added to the article process files with wet signatures.*

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APPENDIX 1 (List of Documents Included in the Qualitative Content Analysis):

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