Rethinking the waste of planetary urbanization for urban challenges: Potential, Strategies and Governance in Terrain Vague projects

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Abstract
Planetary Urbanisation puts pressure on undeveloped spaces in cities. Although perceived as wastelands, such spaces are of unacknowledged socioenvironmental value. Conceptualised as *Terrain Vague*, they have potential to address social and ecological urban challenges. This paper demonstrates how the Terrain Vague can be activated through alternative repurposing strategies and governance. We present three case studies indicative of diverse strategies adopted from different European contexts: Porto Healthy Corridor, a nature-based solution part of URBINAT research project; R-Urban (2013-2017), a community garden in Colombes, near Paris, managed as Urban Commons; Cody Dock, a community-led regeneration and river revitalisation project in London. The analysis shows how rethinking the waste of planetary urbanization can support the circular economy, biodiversity, urban ecology, community development and climate sustainability.

Keywords: wastelands, strategies of repurposing, socioenvironmental value, urban commons, urban ecology

1. **Introduction**

In a world of cities and of Planetary Urbanisation (Brenner and Schmid 2011; Brenner 2013) advancing with increasing speed and frequency, the scale of the urbanization process, the alternation between sprawling and urban shrinking, and the complexity and ineffectiveness of planning processes have led to the emergence of uncertain urban spaces that seem to challenge the traditional dichotomies between urban and rural, city and countryside, value and use.

To refer to such spaces, we adopt the term 'Terrain Vague' coined by Catalan architect and academic Ignasi de Sola-Morales (1995) as a more pluralistic, metaphorical framing, allowing multiple interdisciplinary interpretations. The origins of Terrain Vague spaces can be of different natures (Berger 2006; Clément 2022; Kamvasinou 2011): geography, the presence of particular natural elements, alternating sprawling and shrinking, processes of deindustrialization, ineffective planning or lack of cooperation between different political entities, the abandonment or obsolescence of large built-up areas, spaces awaiting future development, leftover spaces related to large infrastructures such as bridges, motorways, railways, and the design and construction of large public buildings. Such spaces are not integrated into the urban system of public spaces and are temporarily cut off from the city's productive system, usually unnamed and without a specific productive function. In contrast to traditional public spaces of collective use, nowadays increasingly controlled and institutionalized, these spaces are often reclaimed for activities not allowed elsewhere (Kamvasinou 2011). Although often identified as problems and sites of precarity, they have great potential for addressing socioecological challenges.

Indeed, Terrain Vague spaces are refuges for plant and animal species at risk and dynamic places of encounters between different species, generating a rich biodiversity (Gandy 2022, 2013; Clément 2022). They are places of spontaneous appropriation by different communities, informal uses, community gardens, informal agriculture, artistic experimentation (Kamvasinou and Roberts 2014; LaFond 2010). Alternative practices in these spaces challenge traditional planning dichotomies between temporary use and long-term visions, between ownership and use, between top-down and bottom-up planning. Even initial spontaneous and temporary occupations can both bring immediate benefits (such as the strengthening of a sense of community) and influence long-term transformation; even if the property is private, it may be granted temporary public status through concessions to incentivize use of space, bringing benefits to both the user and the owner; finally, there may be an integration of spontaneous and bottom-up initiatives with top-down planning policies and visions (Kamvasinou, 2017).

2. Theoretical Background

Since the late 20th century, terrain vague spaces have been the subject of increasing multidisciplinary interest and study (from architecture to biology, from urban planning to economics, from social sciences to geography). Due to their ambiguous, uncertain, and changing nature, their peculiar characteristics, the inapplicability of the traditional categories of urban public space theory, and the wide variety of disciplines that study them, there isn't one single and unequivocal definition or term for these spaces. Many authors have attempted definitions using varied terms, including Terrain Vague (Solà-Morales 1995; Mariani and Barron 2014; Lévesque 2001), Urban Voids (Lopez-Pineiro 2020), Vacant Land/Lot (Kamvasinou 2011; Bowman and Pagano 2004; Accordino and Johnson 2000; Northam 1971), Drosscape (Berger 2006), Third Landscape (Clément 2022), Urban Wildscapes (Jorgensen and Keenan 2012), and Wasteland or Brownfield (Gandy 2013; Berger 2006). While the specific terminology differs, this range of scholarly attempts to categorize such interstitial spaces not

integrated into the formal urban fabric highlights their ambiguous yet increasingly recognized potential from multidisciplinary perspectives. Although these definitions refer to essentially the same object of study, each of them reveals a disciplinary perspective, a particular nuance, a set of values and visions for the future of these spaces. In a generic and synthetic form, these spaces can be described as open, abandoned, underdeveloped and underused, without a specific function and outside the city's productive circuit, which are not traditional public open spaces such as squares, plazas, or gardens, nor formal agricultural spaces. Among the various definitions, we prefer the definition of Terrain Vague, for several reasons.

First, this definition represents a turning point in the 1990s, because for the first time it values emptiness positively, not as a lack but as freedom, hope, possibility. Secondly because, by tracing the first discovery of these spaces back to artists and photographers, it reveals their close connection with artistic practices and activities and with a free, creative, and utopic vision for these spaces. Finally, because Ignasi de Solà-Morales (1995) advocates the need for a new approach, a new vision for these spaces, which goes beyond functionalism and the traditional dichotomies of urban planning, to preserve and fully exploit the potential of terrain vague spaces.

2.1 From Waste to Terrain Vague

The causes behind the creation of Terrain Vague spaces are undoubtedly the processes of urbanisation and the ineffectiveness of urban planning in controlling the scale of these processes. In the last thirty years, increasingly invasive and rapid urbanisation processes, have challenged traditional definitions of the city. Many authors have attempted to define this form of urbanisation (Sieverts 2003; Brenner and Schmid 2011; Balducci, Fedeli, and Curci 2017; Soja 2000; Brenner 2013), with some common points: i) the end of the traditional dichotomy between urban and non-urban, between town and country; ii) a new scale of urbanisation, reaching as far as the regional, national or global scale, generating increasingly hybrid and blurred boundaries; iii) the creation of a new urban form, which often lacks the fundamental characteristics of the city (Sawyer et al. 2021), characterized by sprawl and dispersion. Furthermore, it is possible to think of wastelands as urbanisation's inevitable by-product (Berger 2006).

However, if we turn upside down our way of thinking, in a vision of recycling and reuse, valuing the local dimension rather than the large scale, we can conceive of these spaces as valuable resources, easily accessible and with great social potential: "Spaces discarded by productive logic but valuable for local communities" (Perrone and Russo 2019, p. 13).

2.2 Social and Ecological Value of Terrain Vague

Terrain Vague spaces intersect social and ecological interests, functioning as sites of daily informal appropriation by local communities (Kamvasinou and Roberts 2014; Careri 2006; Brighenti 2013; Iannizzotto 2023; Mariani and Barron 2014) and biodiversity hotspots where species prohibited elsewhere find refuge and coexist (Gandy 2022; 2013; Clément 2022; McPhearson, Kremer, and Hamstead 2013). Their abandoned state devoid of human control enables spontaneous community uses revealing local needs (Kamvasinou and Roberts 2014), catalysing relationships between residents, collective space management, and an enhanced sense of community (Iannizzotto 2023).

Terrain Vague spaces also hold immense ecological value, already performing vital environmental functions like absorbing rainwater, cleaning air, enabling biodiversity corridors, and providing ecosystem services (McPhearson et al. 2013; Cortinovis and Geneletti 2018). Studies highlight their richness in rare wild species (Gandy 2022, 2016, 2013, 2011; Clément 2022), revealing potential for enhancement through simple interventions and design as nature-based urban solutions (Nunes et al. 2021).

2.3 Terrain Vague as Urban Commons

A reciprocal relationship exists between terrain vague spaces and Urban Commons, allowing projects and practices in these spaces to be viewed through the Urban Commoning lens (Akbil et al. 2022; Dellenbaugh-Losse et al. 2018; Borch & Kornberger 2015; Petrescu et al. 2021; Stavrides 2016). First, the origin and history of many terrains vagues link to common lands, like the UK's common land system, Portugal's rural baldios (Travasso 2022), and Italian movements reclaiming abandoned spaces (Perrone et al. 2022). Second, the informal everyday practices (Chase, Kaliski, and Crawford 1999) and experimental projects occurring in these spaces exemplify "commoning" - managing urban resources not-for-profit and participatorily as Urban Commons (Dellenbaugh-Losse et al. 2018). The Terrain vague suits such projects due to immediate availability, existing community management, its green potential, and separation from market logic favoring use over exchange value (Moniz 2021; Petrescu & Petcou 2023). Urban community gardens epitomize this ecological Urban Commons model (Urban Commons Research Collective 2022).

3. Methodology

We present a qualitative comparative case study analysis of three projects indicative of different strategies adopted for repurposing terrain vague spaces, intentionally chosen from different European contexts - Southern (Porto Healthy Corridor, a nature-based green corridor realized through co-creation processes as part of the URBINAT research project in Porto, Portugal), Central (R-Urban, a community garden with agriculture and cultural events managed as Urban Commons in Colombes near Paris, France from 2013-2017), and Northern Europe (Cody Dock, a community-led post-industrial site regeneration, river revitalization and social enterprise project in Newham, East London, UK). By analysing these varied case studies from different scales, terrain vague types, time durations, strategies and governance models presented side by side, we aim to demonstrate how rethinking the waste of planetary urbanization through alternative repurposing approaches can support the circular economy, biodiversity, urban ecology, community development, and sustainability against climate change.
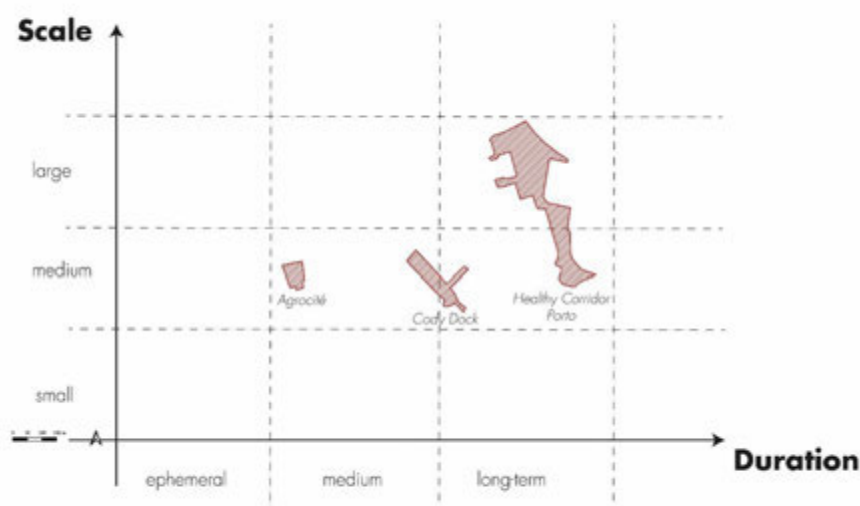
Image 1. Graphical comparison of case studies, represented according to scale and duration.

4. Case studies

4.1 Porto Healthy Corridor

Urbinat (2018-2024), whose acronym stands for 'URBan Inclusive and Innovative NATure', was a six-year project funded within the Horizon 2020 programme, focused on the regeneration and integration of underserved city districts through the design and implementation of nature-based solutions and using participatory and co-creation methodologies (Nunes, Björner, and Hilding-Hamann 2021). The consortium, consisting of partners from public institutions, universities, and private entities from seven European cities (Porto, Nantes, Brussels, Høje Taastrup, Siena, Sofia, Nova Gorica) and other institutions from all over the world, was based on the simultaneous achievement of academic goals and realization of concrete examples, the work of local units and network collaboration at European and international level.

The Project interventions focus on the design and realization of a new type of urban green corridor in the seven partner cities, called healthy corridor, conceived as linear public spaces and clusters of different nature-based solutions, through the inclusion and involvement of residents and local communities in the different project phases, using participatory and collaborative methodologies and the co-creation process. For the entire duration of the process, the Project operates simultaneously through the integration of two different scales: a local scale, through the creation of local living laboratories, relations with the municipality and institutions, involvement of residents, the community, local associations, with events and activities; the international scale of the network, coordinated mainly by universities and academic entities, with the main objective of developing and sharing a single language, a catalogue of solutions,

methodologies, processes and toolkits in common, through continuous activities between partners, meetings, workshops, shared platforms, publications.

The Healthy Corridor concept and strategy, as it was conceived and defined by the network, is based on the creation of linear parks or green corridors connecting different areas, specifically social housing neighborhoods, that are clusters of different nature-based solutions, which are chosen, designed and implemented in stages through a process of co-creation, thus initiating an attempt to connect human and ecological interests and goals (Moniz 2021).

Since the objective of the healthy corridor is the creation of new paths and green public spaces in neighborhoods with fewer services and infrastructures, by intervening in the existing city and without proposing major demolitions, it is consequently quite clear that one of the privileged sites of intervention are the terrain vague or abandoned spaces. Indeed, in the first conception and theoretical definition of the healthy corridor, terrains vagues are proposed as privileged intervention spaces, implicitly revealing their social and ecological potential: "the Healthy Corridor is a cluster of NBS that can occupy urban voids or common ground that is not being used or needs regeneration, becoming a link between different areas of the city, contributing to avoidance of the segregation effect and to the promotion of social and urban cohesion" (Moniz 2021, p.19).

In the city of Porto, *Campanhã* parish has been identified as one of the priority areas to intervene on and chosen for the design of the healthy corridor. This area, mainly residential and with a high percentage of public social housing, presents some criticalities and challenges, mainly due to partial isolation, fragmentation, lack of accessibility, lack of a sense of security or safety itself, scarcity of quality public spaces and public services. However, this area is particularly rich in Terrain Vague spaces, which are, from the early stages of study, analysis, and diagnosis, identified as possible areas for intervention and as spaces with high potential. As in many other cases, as we have reported previously, the presence of terrain vague spaces is due to the fragmentation of the territory, which, from being an agricultural area until the relatively recent past, has been subjected to rapid, invasive processes of urbanization, punctual, zonal and in the absence of an effective overall plan or vision, which, together with the creation of various road infrastructures (motorways and railways) has contributed to the fragmentation of the area.

In fact, even today these abandoned spaces retain ruins, traces, and memories of their agricultural past, blending in and almost disappearing amidst the new residential buildings, and "this represents a unique opportunity to properly occupy such areas in order to connect key areas and create a multifunctional green continuum in the territory – a Healthy Corridor" (Moniz 2021, pp.36-37).

From the very first phases carried out together with the residents and the population, i.e. the phase called co-diagnosis, these spaces were immediately identified both by the community as priority spaces on which to intervene, and by the experts who recognized their ecological and social potential. An initial phase of identification and mapping of these voids was followed by a second phase in which cadastral checks were carried out to identify abandoned areas owned by the municipality, with the aim of selecting the areas on which it was easiest to intervene. Then, through local activities with residents and the community, solutions and functions began to be outlined. Thanks to the flexibility of the proposed solutions and the methodology used, the consortium's catalogue of solutions was enriched with solutions proposed during the activities, and it was also possible to think up solutions that were suitable in specific contexts and in accordance with the community's wishes, as in the specific case of the historical ruins of

an old farm, which it was decided to keep because it was part of the inhabitants' collective memory.

In fact, the diversity and peculiarity of terrain vague spaces stimulates a variety of different solutions, difficult to design or plan a priori, without knowledge of the context and the actors involved. Due to the large scale, the large number of institutions, bodies, associations involved, the costs and the complexity of the healthy corridor, the project envisaged several implementation and feasibility phases, thus taking time into account as a factor in the project.

At the end of the Research Project, the Project was presented to and accepted by the municipality and all the various stakeholders, and on 20 February 2024 the Porto Healthy Corridor was officially realised, inaugurated and opened to the public: "The realisation of the Campanhã URBiNAT Healthy Corridor is a good example of how collaborative planning and community involvement can lead to meaningful and beautiful urban transformations, setting a precedent for future projects in Porto, in other cities across Europe, and beyond" ('[Porto PT] Inauguration of the URBiNAT Healthy Corridor in the District of Campanhã, Porto', n.d.).

4.2 R-Urban, Paris

R-Urban (Petcou and Petrescu 2020, 2015; Petrescu and Petcou 2023; Atelier Architecture Autogérée 2022) is an ambitious strategy, conceived by Atelier Architecture Autogérée, based on the introduction of a network, entirely managed by the residents in a bottom-up way, made up of a series of hubs, each with its own specific function but interconnected with each other, with the objective of managing material and immaterial flows by promoting a new model and lifestyle, sustainable and resilient, managed directly and autonomously by the residents and alternative to the capitalistic and profit oriented model of the city.

R-Urban, was conceived after three years of research by the collective platform Atelier Architecture Autogérée as a model, as a theoretical network that can be applied and implemented in various contexts, then adapted to the specificities of the local context; some hubs have already been tested in Colombes (near Paris), Paris and London. The concept, which is inspired by models of resilient cities from the history of architecture and town planning (Garden City, Regional City and Transition Town), is guided by a clear ecological and political approach based on Lefebvre's concept of the right to city (Lefebvre 1968) and especially Harvey's more recent reformulation of it (Harvey 2008) as not only the right to live, but above all the right to decide and change the city by residents.

The Project is conceived as an infrastructure, a network capable of managing material flows (production, consumption) but also, and above all, immaterial flows (exchange of knowledge, relationships), which proposes another model of urban lifestyle, alternative to that of profit, the capitalist state and the logic of the market and exploitation, based on flows of production and consumption based on sustainability and resilience and entirely managed from below, in accordance with the vision that sees closely correlated ecological, social and political instances.

The fundamental concept is resilience, "…a dynamic concept, which does not have a stable definition and identity outside the circumstances that produce it… resilience is adaptive and transformative, inducing change that offers huge potential to rethink assumptions and build new systems" (Petcou and Petrescu 2020). R-Urban operates simultaneously at the global, regional and local scales: while on the one hand it proposes almost a concrete utopia, a strong political critique realized in practice, on the other hand it proposes a system of resource flows and

exchanges that functions on a regional scale, at the same time it is based on the complete and direct bottom-up management of residents, thus absolutely flexible to local peculiarities and contexts.

In fact, the aim is to boost, together with experts and institutions, a process that will later be completely autonomous and managed directly by residents and associations. Finally, it is useful to note that in the case of R-Urban, but also of other projects, Atelier Architecture Autogérée, on the basis of its direct experience, prefers as intervention spaces abandoned or underused, easily accessible and outside the city's production and profit circuits, i.e. exactly the terrain vague spaces, revealing a real strategy of interstices that "involves spaces, actors, local partners, time" (Petcou and Petrescu 2020).

There are at least two reasons for this: it enables prompt action by avoiding lengthy negotiations over private property, and more importantly, it redefines and devalues the power of private property as the basis for urban planning choices, instead revaluing the use value of spaces. After three years of research, the collective proposed R-Urban to local authorities and grassroots organizations in France. In 2011, the first implementation began in Colombes, a Parisian suburb of 84,000 residents with a "typical mix of private and council housing estates," with support from local institutions, associations, and residents. Three interconnected hubs were planned, though only two were realized: Agrocité, an agricultural unit with a small farm, community gardens, and educational spaces on sustainable resource management; and Recyclab, a space for recycling, tool storage, and resident-built eco-housing using discarded materials. The unrealized Ecohab was envisioned as a cooperative, partly self-built eco-housing project with shared spaces. Significantly, all the realized Colombes hubs occupied abandoned spaces resulting from large-scale planning oversights, exemplifying the potential of terrain vague: "Agrocité was located on a 2000 sqm vacant lot near Fossés Jean; Recyclab was built on a disused road; and Ecohab was planned for a vacant plot between the other two hubs" (Petrescu and Petcou 2023), demonstrating in practice the value of these ambiguous urban spaces.

During the period of regular activity, from 2011 to 2016, the Colombes R-Urban network achieved important objectives and results and a considerable involvement of the population, in fact from the ecological point of view, it has initiated processes of information, sustainable production and consumption of food, agriculture and livestock, recycling, rainwater absorption, air cleaning, and many others; from the social point of view, around 6900 people have participated in the site's activities, 400 of whom have become active stakeholders, learning and sharing skills, techniques and knowledge on agriculture, recycling and sustainability, as well as participating in workshops and cultural activities of various kinds; some residents have started small business activities within the network, thanks to the skills acquired and the voluntary work carried out. Paradoxically, the greatest threat and difficulty for the project came from the municipality and politics: in the name of a phase of urban regeneration of the neighborhood and social housing complexes, and following a change in the city's political direction, the mayor of Colombes decided to replace Agrocitè with a car park and to dismantle Recyclab to clear the space for new projects in the future.

This negative and unexpected occurrence demonstrates both the fragility and transience of projects implemented in terrain vague spaces, especially of a temporary and tactical urbanism nature, when they are not adequately foreseen, framed and protected within the legislative framework; and the difficulty of proposing and implementing real alternatives to speculation and the private market linked to investment and profit in the context of the contemporary city.

However, this threat stimulated several interesting reactions and reflections. First, it gave rise to a protest movement against the demolition by residents, thus demonstrating people's attachment to the project and the community's positive assessment of the benefits.

Then, in order to counter the municipality's main thesis, i.e. a faster economic return resulting from the activity as a car park, it stimulated a research aimed at calculating the economic value of the value produced by urban commons and resilience, i.e. calculating quantitatively and economically, in a language more easily understood by the business enterprises and the municipality, all those advantages, benefits and acquired values, both material and immaterial, resulting from the network's activity in those years.

Finally, despite the decision of the court and the municipality in 2017 to proceed with the actual demolition of the two R-Urban hubs in Colombes, the project and the community showed a great spirit of adaptation that brought the project to a second life, in another location. In fact, following negotiations with some neighbouring municipalities that were more attentive to the project, both Agrocité and Recyclab were dismantled and reconstituted in other locations, in Gennevilliers and Nanterre respectively, thus testing and demonstrating both the conception and adaptability of both the project (conceived with recycled material and following the principles of resilience, ready to be quickly assembled and disassembled) and the community, which had over time acquired the knowledge and experience necessary to carry out and manage this type of relocation.

4.3 Cody Dock, London

Cody Dock is a community-focused environmental project that aims to promote ecology, biodiversity, and creative industries in an urban setting. It is located in a post-industrial site along the River Lea in the East London borough of Newham. It has undergone a transformation from an industrial dock used for transporting coal and byproducts in the Victorian era, to a derelict and contaminated brownfield site after its decommissioning as a port in 1967. The surrounding area features a mix of warehouses, industrial parks, cement works, and vacant post-industrial sites.

In the early 2000s, Simon Myers, the current CEO of the Gasworks Dock Partnership (GDP) who are the legal tenants and manage the site, discovered the dilapidated Cody Dock while living on a boat on the River Lea (Interview with Myers 2013). He began engaging with the key stakeholder, Thames Water who owned the site, to acquire a lease. After initial failed attempts, the 2008 economic crash provided an opportunity and in 2009 Myers secured a 999-year lease for the site (Kamvasinou 2017). GDP was established first as a social enterprise in 2009, and later formalized as a charity in 2011. Its mission was to transform Cody Dock into a working marina and arts hub through providing moorings for live-in boats, renting artist studios, and restoring public access to the River Lea. Environmental restoration, education about local history and ecology, and community-building through events and partnerships were core aims (Kamvasinou 2017).

The project's governance model is anchored in GDP as the lead organization, but involves collaborations with numerous other charities, businesses, individuals and community groups who help shape the site through partnerships (Interview with Myers 2013). An openness to unexpected events, like increased visitors during the Covid-19 lockdowns, allowed new meanings around health, wellbeing and greenspace to emerge.

While Thames Water owns the dock itself, the London Borough of Newham controls the access points. This multi-stakeholder situation, along with Cody Dock's complex history across pre-industrial, industrial and post-industrial eras, creates challenges but also opportunities for innovative governance models bridging top-down and bottom-up approaches.

Over time, the focus evolved from temporary activities like music events and art exhibitions, to more permanent facilities like an exhibition space, a therapeutic horticultural classroom ('The Growing Space'), and ecological infrastructure like floating reedbeds, the last two interventions associated and built in collaboration with live studio student work at the School of Architecture and Cities, University of Westminster (see https://www.architectsjournal.co.uk/buildings/university-of-westminster-completes-community-space-at-londons-cody-dock). Community participation and an incremental, organic approach to placemaking have been central philosophies in the evolution of the project from temporary to permanent, and from a physical site to a site of education and knowledge exchange, including the University of Westminster's research, teaching projects and community engagement exercises exploring topics like temporary urbanism, climate urbanism, biodiversity, socio-ecological relationships, and skills for interdisciplinary climate/health projects (Kamvasinou et al 2023).

The project combines ecological conservation efforts with artistic and creative installations. For instance, as Gino Brignoli, biodiversity officer, informed us on the occasion of a University of Westminster staff and students visit in March 2024, they are currently working with an artist to install a sound art piece that incorporates recordings from the area and involves placing hydrophones in the river to allow visitors to listen to the underwater sounds and aquatic life. Cody Dock also provides affordable studio spaces for artists, sculptors, sound designers, and architects, helping to keep the creative industries alive in the area. However, the demand for these studios far outweighs the supply.

Cody Dock aims to enhance biodiversity along the River Lea corridor through habitat creation and management efforts on their site. Part of Cody Dock's work involves ecological restoration of the dock area, carried out largely by volunteers. The charity collects ecological data and conducts biodiversity monitoring and conservation through various means. For example, as Brignoli mentioned, they conduct regular bird surveys every Friday along the river, culminating in collecting 8 years' worth of data that are shared with the British Trust for Ornithology to contribute to nationwide monitoring efforts. They host monthly "Beer and Bats" events where they teach about bat identification and conduct bat surveys, sharing the data with the Bat Conservation Trust, thus contributing to national databases and research.

Brignoli highlighted that the project heavily relies on volunteers who participate in various ecological activities, such as identifying bumblebees, bird watching, bat monitoring, and gardening. Field training and workshops are provided to volunteers to equip them with necessary skills, while community engagement is a significant aspect of the project. They host seasonal open days, film clubs, and workshops that are open to the public. They also work with local schools, bringing students to the site and conducting educational activities. A major focus is providing environmental education opportunities, especially for urban youth who may have limited exposure to natural areas. To this end, they bring school groups on boat trips on the river to experience being on the water in a natural setting. Some of the school children visiting have never even sat on grass before, so they aim to connect urban communities to local ecology. They are transitioning from movable planters to building permanent brick planters with help from local college students and volunteers, establishing more permanent green spaces.

Not everything is easy, however. As Brignoli confirmed, the project faces challenges in securing long-term funding. While they receive grants and funding from sources like the National Lottery, many of the staff positions are grant-funded and have limited duration. There is an ongoing conflict with local developers who sometimes engage with the project for consultation but then proceed with their plans without fully considering the recommendations. The project aims to expand its operations to other parts of the dock area, with plans to build a musical pavilion and restore an old lifeboat if funding becomes available.

Overall, Cody Dock represents a unique initiative that combines environmental conservation, community engagement, artistic expression, and support for creative industries in an urban setting. Particularly biodiversity conservation through monitoring, habitat restoration, and promoting awareness and appreciation of local ecology and wildlife seem to be core tenets of their environmental efforts at Cody Dock. They encourage volunteer participation and partnerships to achieve these goals, highlighting the importance of such projects in promoting biodiversity, education, and sustainable development.

5. Discussion: Potential, Strategies and Governance in Terrain Vague projects

The three case studies provide an overview of the potential of projects in Terrain Vague sites. Below we discuss this potential and compare and contrast the strategies and governance models adopted in the three case study projects as well as how these projects support the circular economy, biodiversity, urban ecology, community development, and sustainability against climate change.

5.1 Potential in Terrain Vague

By approaching terrains vagues as not just 'empty' or 'abandoned' but as transitional spaces with the potential for transformation, architects, planners, nonprofits and community stakeholders can draw upon their inherent ambiguities to reimagine and revitalize the urban narrative and to integrate with formal design and planning practices on terrain vague sites. The abundance and variety of Terrain Vague spaces in urban areas, as seen in Porto and Colombes, highlights their potential for repurposing.

The socio-ecological value of these neglected spaces lies in offering opportunities for nature integration and community appropriation, both crucial for a more resilient and regenerative approach to urban development. In this process, important features are the flexibility and adaptability of Terrain Vague projects, as showcased by R-Urban's relocation capabilities. Temporary uses of such sites contain clues to the potential diversity of future activities they might contain (Mostafavi and Najle 2003, p.7). The theory of Urban Political Ecology discusses the concept of nature as 'a constructed rather than a pre-given concept…subject to political re-definition and re-articulation' (Keil 2003, pp.726-27). Indeed, the Landscape Urbanism movement supports the idea that urban and natural landscapes come together in complex and important ways; under this theory, abandoned terrain vague sites form part of a larger urban ecosystem (Corner 2003). Vacant land is thus an opportunity, not just a problem, more easily incorporating interim uses that can reveal potential for bottom-up, community-driven placemaking that creates more inclusive spaces than top-down imposed development.

5.2 Strategies applied

Several distinct strategies can be discerned through the case studies. First, co-creation and participatory processes, as employed in Cody Dock's community-focused and participatory approach involving volunteers, local communities, and local partnerships, and in the Porto Healthy Corridor project, involving residents and local communities in various project phases of design and implementation. This strategy involved also a multi-scalar approach, operating at both local and international levels, with local living laboratories and a network of partners sharing knowledge and resources. Similarly, R-Urban employed a bottom-up, resident-managed network of interconnected hubs, each with specific functions (e.g., agriculture, recycling, eco-housing), suggesting a model that be adapted to local contexts and specificities. In addition, this strategy was enhanced through environmental education in the case of Cody Dock.

Second, tactical urbanism and temporary interventions acting as experiments, exemplified by R-Urban's temporary hubs that can be relocated and reassemblied in different locations when necessary, and Cody Dock's incremental and organic placemaking approach based on community engagement through temporary events, artistic installations and workshops, evolving over time to more permanent facilities.

Third, Terrains Vague spaces as intervention sites for the implementation of nature-based solutions (NBS) and ecological restoration, as seen in the green corridors and clusters of Porto, and in the ecological conservation and habitat creation efforts at Cody Dock.

Finally, intentional focus on intervening in abandoned or underused urban spaces (terrain vague) like R-Urban's approach, promoting adaptive reuse and repurposing of post-industrial sites in a way that respects their inherent qualities and history, like Cody Dock's transformation from an industrial dock to a community hub.

5.3 Governance models

The case studies show that temporary interventions allow for more experimentation, iteration and organic evolution based on diverse users and that partnerships between grassroots groups, local authorities, and developers can be mutually beneficial if balanced. Programming and activities are important - physical spaces alone don't guarantee inclusivity.

In the Porto project, a collaborative governance model operated at two scales involving a local scale consortium of local authorities, public institutions, universities, private entities, and local communities, engaged as stakeholders in the project, and an international scale a network of partners, universities, and academic entities. Community involvement and co-creation processes allowed residents to participate in the decision-making and design of the interventions.

R-Urban championed a bottom-up, resident-led governance and management of the hubs and network, involving local institutions, associations, and residents in the implementation process. This model was conceptualized as an alternative, autonomous model managed by residents, independent from capitalist urban development.

Collaborative and multi-stakeholder governance with the Gasworks Dock Partnership (GDP) as the lead organization was the model at Cody Dock while partnerships with various charities, businesses, individuals, and community groups contributed to shaping the site. An expansion of this model included the involvement of the University of Westminster through research,

teaching projects, and community engagement exercises, culminating in the building of structures on the site as part of live student projects. GDP had also to navigate a complex governance situation with multiple stakeholders, including Thames Water (site owners) and the London Borough of Newham (controlling access points).

In conclusion, Terrain Vague projects tend to promote bottom-up, community-led initiatives, and multi-stakeholder collaborations and partnerships, as demonstrated by Cody Dock's evolution and governance by the Gasworks Dock Partnership, as well as urban commons and collective management, as practiced in the R-Urban project's resident-managed hubs. However, these models of governance are not without their challenges, exemplified in the role of municipalities and potential conflicts, as seen in R-Urban's clash with the municipality of Colombes, and a precarious balance relating to funding (of jobs, maintenance works and everyday running costs) seen in the case of Cody Dock.

5.4 Addressing Urban Challenges

Circular Economy
The reuse and repurposing of Terrain Vague spaces could be considered a form of urban resource optimization. For example, Cody Dock has been turned from a working dock and industrial site to a community and arts hub, working marina for live-in boats and river restoration project.
Practices of material reuse and recycling are at the foreground, highlighted by R-Urban's Recyclab hub and the reuse and recycling of discarded materials in their eco-housing construction, as is promotion of sustainable resource management and urban agriculture, as illustrated by Agrocité in R-Urban and the community gardens in Porto.

Biodiversity
Both Cody Dock and the Porto Healthy Corridor project demonstrate significant efforts in habitat creation and ecological restoration, like the floating reedbeds and horticultural interventions at Cody Dock, enhancing biodiversity along the River Lea corridor through habitat creation and management, or the bird surveys and bat monitoring activities contributing to national databases and research. Similarly, integration of nature-based solutions and green corridors, which can contribute to enhancing urban biodiversity and creating ecological connections, as seen in the Porto Healthy Corridor project. Crucially, awareness and appreciation of local ecology and wildlife can be strongly promoted through educational activities and community engagement, as seed in Cody Dock, reiterating the importance not just of the physical space but of programming and appropriate activities to provide an alternative experience of the urban environment that can have transformational effects in addressing urban challenges.

Urban Ecology
The role of Terrain Vague projects in enhancing urban biodiversity and creating ecological corridors is exemplified by all three case studies. The implementation of linear green corridors and nature-based solutions can support urban ecology by introducing green infrastructure, creating habitats, and promoting ecological connectivity within the urban fabric. The projects chart the evolution of the potential for spontaneous nature to thrive in these neglected spaces, free from human control, to a purposeful integration of urban agriculture, community gardens, eco-housing principles, and promotion of rainwater absorption and air cleaning through green infrastructure as seen in the work of R-Urban. The projects connect urban communities to local

ecology through educational and community engagement activities, like Cody Dock's river trips and educational work with local schools, especially targeting urban youth, or their ecological restoration work of the dock area, carried out largely by volunteers, including integration of ecological infrastructure like floating reedbeds and permanent green spaces (brick planters).

Climate and Sustainability
The ease of integration of green infrastructure and nature-based solutions in terrain vague sites can contribute to urban greening, climate resilience and sustainability by mitigating the urban heat island effect, promoting rainwater absorption, and enhancing air quality. The promotion of green spaces and ecological conservation efforts as seen in Cody Dock and the Porto Healthy Corridor can contribute to urban resilience and sustainability Community gardens and urban agriculture, as seen in R-Urban, can contribute to local food production and reducing carbon footprints, while putting emphasis on resilience, adaptability, and sustainable urban lifestyles as an alternative to profit-oriented urban development through promotion of sustainable resource management, production, and consumption practices.

Community Development
The case studies demonstrated diverse strategies for fostering community development through participatory processes, capacity building, and the creation of shared spaces and resources.

In Porto, the Healthy Corridor project actively involved residents and local communities through co-creation processes, participatory activities, and capacity-building initiatives. This approach promoted social cohesion and cultivated a sense of community ownership over the urban interventions. Similarly, Cody Dock adopted a community-led approach, emphasizing strong community participation, engagement, and capacity building through various activities, workshops, and volunteer opportunities.

The R-Urban project placed significant emphasis on community involvement, facilitating skill-sharing and knowledge exchange through workshops and cultural activities. It provided shared spaces for collective resource management and enabled residents to initiate small business activities based on the skills and voluntary work within the network. Crucially, R-Urban championed the "right to the city" principle, empowering residents to actively shape their urban environment.

All three projects contributed to enhancing community connections and environmental awareness. For example, Cody Dock collaborated with local schools and hosted educational programs, strengthening community ties and promoting appreciation for local ecology. Similarly, the provision of affordable creative spaces, such as artist studios and moorings for boat dwellers, supported alternative lifestyles and artistic expression within the community. Overall, by creating green public spaces and integrating community-driven activities, these projects aimed to improve the well-being and quality of life for residents, particularly in underserved areas, promoting social and environmental sustainability.

6. Conclusions

This analysis has demonstrated the immense potential of rethinking and repurposing terrain vague spaces beyond their perception as 'waste' through alternative strategies and governance models. The case studies of the Porto Healthy Corridor, R-Urban in Colombes, and Cody Dock in London reveal how activating these neglected urban sites can powerfully address critical

urban challenges related to the circular economy, biodiversity conservation, urban ecology, community development, and sustainability against climate change.

The projects exemplify diverse approaches ranging from participatory co-creation processes involving residents and multiscalar collaborations, to tactical urbanism through temporary interventions acting as urban testing grounds. A unifying strategy lies in the intentional focus on terrain vague as prime intervention spaces - embracing the inherent ambiguities and indeterminacies of these sites to integrate nature-based solutions, test alternative living, and enable community appropriation.

Significantly, the cases point towards governance models promoting urban commons and bottom-up, resident-led initiatives over profit-driven urban development. Multi-stakeholder collaborations between grassroots groups, local authorities, NGOs and academic partners enabled knowledge exchange and capacity building. However, the projects also navigated complex stakeholder relationships and precarious balances relating to political conflicts and funding insecurities.

Ultimately, rethinking terrain vague through an ethos of shared resources, environmental stewardship and community empowerment can catalyse more equitable, resilient, and regenerative forms of urbanism. As cities grapple with intensifying social and ecological pressures, the latent potential of terrain vague offers an opportunity to re-envision the urban experience through smaller-scale, locally-attuned interventions capable of transformative impacts.

Acknowledgements

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