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Editorial

Spatial Knowledge and Urban Planning

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Abstract
Urban planning is simultaneously shaped by and creates new (spatial) knowledge. The changes in planning culture that have taken place in the last decades—especially the so-called communicative turn in planning in the 1990s—have brought about an increased attention to a growing range of stakeholders of urban development, their interests, logics, and participation in planning as well as the negotiation processes between these stakeholders. However, while this has also been researched in breadth and depth, only scant attention has been paid to the knowledge (claims) of these stakeholders. In planning practice, knowledge, implicit and explicit, has been a highly relevant topic for quite some time: It is discussed how local knowledge can inform urban planning, how experimental knowledge on urban development can be generated in living labs, and what infrastructures can process "big data" and make it usable for planning, to name a few examples. With the thematic issue on "Spatial Knowledge and Urban Planning" we invited articles aiming at exploring the diverse understandings of (spatial) knowledge, and how knowledge influences planning and how planning itself constitutes processes of knowledge generation. The editorial gives a brief introduction to the general topic. Subsequently, abstracts of all articles illustrate what contents the issue has to offer and the specific contribution of each text is carved out. In the conclusion, common and recurring themes as well as remaining gaps and open questions at the interface of spatial knowledge and urban planning are discussed.

Keywords
evidence-based planning; knowledge; knowledge orders; learning; negotiation; planning; stakeholders; urban living labs

Issue
This editorial is part of the issue "Spatial Knowledge and Urban Planning" edited by Anna Juliane Heinrich (TU Berlin), Angela Million (TU Berlin), and Karsten Zimmermann (TU Dortmund).

1. Introduction

Current urban transformations are not only changing the spatiality of cities and regions. They influence spatial knowledge and also lead to new processes of knowledge production. Spatial transformations can be seen "as processes of communicative actions and social practices embedded in people's everyday lives. What people experience, want, believe, know, do, and how they interact in turn engenders new institutions and novel forms of localization, interconnectedness, and spatially shaped (self-)experience" (Million et al., 2022a, p. 3). In such actions and practices stakeholders gain knowledge, but they can also draw on more available knowledge. This, nowadays, regularly includes knowledge that goes beyond the local and beyond people's own experience. One driver here is the advancing (digital) mediatization of spatial knowledge. Today, knowledge is at least potentially available worldwide through a growing number and variety of media (e.g., print, television, internet, social media) and institutions (e.g., foundations, academia, consultancies, government agencies). At the same time, local and situated knowledge does not lose its relevance and is stressed as "a socially situated, contextualized 'knowledge' that is always aware of its split, its ambiguity and instability" (Maurer, 2019,

p. 373, referring also to Haraway, 1995; own translation from German). Urban planners and decision-makers are increasingly confronted with the dilemma of making a choice out of ubiquitous knowledge sources and this includes a thorough and legitimate review of what counts as valid knowledge. Having said this, it is the aim of this thematic issue to address changes in spatial knowledge production and its significance as a resource in planning. Of interest are further the growing complexity of negotiating between different stocks of knowledge and validity claims of participating stakeholders within planning processes.

Changes in planning culture have been discussed many times in recent decades, especially the turn towards participatory and cooperative forms of planning—the so-called communicative turn in planning (Healey, 1992)—in the 1990s. More recently the rise of the concept of co-production of knowledge has found increasing attention (Watson, 2014). However, while the interests of stakeholders, logics, and strategies of planning have been analysed in detail, we believe that only scant attention has been paid to the knowledge (claims) of these stakeholders and how this could inform planning, decision-making, and the materiality of implementations (Campbell, 2012; Rydin, 2007). In the face of increasingly complex stakeholder constellations in planning on the one hand and an ever-increasing availability of information (to also mention big data here) on the other hand, planning processes can be re-read as processes of exchanging and negotiating knowledge and knowledge claims, processing information, and generating broadly "accepted" spatial knowledge. Since different spatial knowledge stocks can be identified—such as planning-related expert knowledge, political knowledge, local knowledge, knowledge of citizens, or of knowledge communities—the question of legitimacy and the role of counter-knowledge in the negotiation processes of these different knowledge stocks in planning arises.

Spatial knowledge appears in many different forms such as indicators, ideas, and visions and these forms of spatial knowledge organize and stabilize expectations (i.e., futures states of spatial development). For us, spatial knowledge also encompasses the (socialized) experience of space, spatial concepts, and the emotions and affects associated with space. It includes implicit and physical, linguistic, or otherwise communicatively objectified knowledge that is thought of as guiding action. In practice, spatial knowledge is an assemblage of everyday ideas and scientific-technical concepts (Läpple, 1991), aesthetical experiences (Sturm, 2019), as well as affects and geographical ideas or imaginations (Gregory, 1994; Ingold, 2011; Urry, 2006). Current interdisciplinary research on "imagining, producing, and negotiating space" (Million et al., 2022b, pp. 241–309) suggests that different forms of knowledge production come into play and that subjective and objective knowledge stocks on space are more and more mediatized within modes of fast circulation, again due to digitalization.

Against this background we invited articles aiming at exploring the diverse understandings of (spatial) knowledge, and how knowledge influences planning and how planning itself constitutes processes of knowledge generation. We wanted the authors to address the following subjects:

- Theoretical reflections on negotiating knowledge claims in planning;
- The role of digitization of planning for spatial knowledge and its distribution;
- The role of indicators for valid knowledge production and evidence-based planning;
- Subjective spatial knowledge and its relevance for planning;
- Circulation of spatial knowledge;
- Informal production of knowledge;
- Policy expertise and the role of policy advice;
- Contested knowledge and conflict resolution.

As editors we have to acknowledge that the contributions to the thematic issue do not cover all of these topics. There are several reasons for this, but one is certainly the fact that living labs and co-production are timely issues in planning while evidence-based planning and policy advice seem to be less popular. The next section shall navigate the reader through the structure of the issue as a whole and show what contents the issue has to offer. Following this overview over the specific contribution each article makes, we discuss the common and recurring themes as well as remaining gaps and open questions at the interface of spatial knowledge and urban planning in the last section of this editorial.

2. The Contributions to the Thematic Issue

The thematic issue is opened by the article ""DALSTON! WHO ASKED U?": A Knowledge-Centred Perspective on the Mapping of Socio-Spatial Relations in East London" (Jungfer et al., 2022). The authors, Carsten Jungfer, Fernanda Palmieri, and Norbert Kling, introduce their topic with a comprehensive literature review of the theme of the thematic issue. Subsequently, insights from the "Relational States of Dalston" mapping project are presented. The starting point of the investigation was a planning controversy, which erupted around a masterplan by the London Borough of Hackney whose implementation would have required the displacement of several cultural and social enterprises in the Dalston Quarter. The design-led enquiry makes a convincing case for maps as tools for visualizing and thereby assembling, processing, ordering, layering, and generating local knowledge in processes of urban transformation.

The following two articles enrich the thematic issue by challenging commonly asserted knowledge hierarchies with feminist perspectives on voices and knowledge resources of marginalized groups that are often excluded from urban planning practices. Taking

a decolonial stance, Stephanie Butcher, Camila Cociña, Alexandre Apsan Frediani, Michele Acuto, Brenda Pérez-Castro, Jorge Peña-Díaz, Joiselen Cazanave-Macías, Braima Koroma, and Joseph Macarthy frame processes of knowledge mobilization and co-production as "emancipatory circuits of knowledge" (Butcher et al., 2022). The authors identify three cross-cutting strategies to decenter knowledge and thus to reduce urban injustice. What sets their article on ""Emancipatory Circuits of Knowledge" for Urban Equality: Experiences From Havana, Freetown, And Asia" apart is that they do not only engage with small-scale case studies but also embrace an example for a supra-regional network of co-learning.

Zuzana Tabačková (2022) adds to the thematic issue a perspective from Central and Eastern Europe. In her contribution, entitled "Transforming Spatial Practices Through Knowledges on the Margins," she portraits two organizations operating in Slovakia and Czechia and carves out how their practices make marginalized spatial knowledge matter. Following a praxeological approach, the focus of the study is on spatial practices, know-hows, and visions.

In contrast to these good practice examples, Ulrik Kohl and John Andersen (2022) discuss what they call a "knowledge co-creation fiasco." Under the heading "Copenhagen's Struggle to Become the World's First Carbon Neutral Capital: How Corporatist Power Beats Sustainability," they illustrate how differing knowledge claims were made and enforced around the planning, permission, building, and operation of a waste-to-energy plant. Their case stresses the relevance of coalitions of knowledge (production) and shows that combining different knowledge stocks is of utmost importance for maximum impact on discourses and ultimately decision-making.

Hanna Seydel and Sandra Huning (2022) present storytelling as an approach to tackle power imbalances in planning processes and to provide for a productive co-creation of knowledge. "Mobilising Situated Local Knowledge for Participatory Urban Planning Through Storytelling" is the first of three articles which deal with experimental planning approaches, mostly urban living labs and real-world labs. The specific added value of this contribution is the conceptual linking of the issues of positionality and situated knowledge in the context of participatory planning.

After that, a comparison between urban living labs in four European capital cities is drawn by Doina Petrescu, Helena Cermeño, Carsten Keller, Carola Moujan, Andrew Belfield, Florian Koch, Denise Goff, Meike Schalk, and Floris Bernhardt. While the article also discusses the generation of spatial knowledge and the negotiation of knowledge claims, it focusses on urban living labs as a methodology for these purposes. As indicated by the title "Sharing and Space-Commoning Knowledge Through Urban Living Labs Across Different European Cities," practices and experiences of sharing and space-commoning in different cities are the empirical reference of this article (Petrescu et al., 2022).

The text that follows focusses on "The Scaling Potential of Experimental Knowledge in the Case of the Bauhaus.MobilityLab, Erfurt (Germany)" (Kraaz et al., 2022). Central to this article is the question of how we can evaluate scaling potentials of real-world labs and thus tap potentials of transferability. The authors, Luise Kraaz, Maria Kopp, Maximilian Wunsch, and Uwe Plank-Wiedenbeck, offer a methodical approach to capture transferable implications from site-specific, experimental knowledge in planning.

With the next contribution to the thematic issue, an evidence-based planning tool for the generation and accumulation of spatial knowledge is introduced. Under the title "Evidence-Based Planning: A Multi-Criteria Index for Identifying Vacant Properties in Large Urban Centres," Thiago C. Jacovine, Kaio Nogueira, Camila N. Fernandes, and Gabriel M. da Silva adopt a methodological perspective. The authors explain in detail the developed tool to identify the vacancy probability for properties in São Paulo's downtown area and thereby emphasize the relevance of large-scale, data-based planning approaches for urban planning policy (Jacovine et al., 2022).

Sophie Mélix and Gabriela Christmann (2022) top off the thematic issue with their article on "Rendering Affective Atmospheres: The Visual Construction of Spatial Knowledge About Urban Development Projects." Two unique features characterize this contribution: Firstly, it takes into consideration spatial knowledge about imaginaries of potential urban futures. Secondly, visuals are discussed as media of knowledge generation and knowledge transfer. Focusing on renderings, the authors work out how digital visualizations of envisaged urban developments are designed and what spatial knowledge they convey and how.

We are grateful to all authors for responding to our call and taking up many of the issues of knowledge and planning we raised in it. As it stands, the thematic issue provides an overview of current discussions on spatial knowledge and urban planning, with a particular focus on the relevance of local and situated knowledge. In addition, the various methodological contributions provide approaches for further research. Notwithstanding, we ask ourselves how the contributions fit into the existing body of publications on knowledge and planning and what conclusions need to be drawn with regard to future research. In the conclusion, we would like to look at this.

3. Knowledge in Planning: Avenues for Future Research

The discussion on knowledge in planning was (and still is) shaped by the difference between lay knowledge and expert knowledge. In her book *Knowledge and Public Policy*, Judith Innes (1990) introduced the notion of "usable knowledge" by contrasting technocratic indicators with a more cooperative mode of knowledge

generation. From then on, formulations such as inclusive knowledge, participation, and communicative planning dominated the discussion. We see a continuity here with regard to the current widespread use of living labs. Living labs are seen as new ways of producing a kind of practical or usable knowledge.

Though not explicitly mentioned in many of the contributions, this refers also to the well-established distinction between tacit and explicit knowledge. The differentiation of knowledge forms is a widespread approach in the planning sciences (Vigar, 2017). Although a variety of approaches and typologies of knowledge forms exists, all these approaches share the view that planning needs more than technical and professional knowledge and that ways need to be found in order to mobilize informal knowledge, lay knowledge, etc.

In continuation of this, the procedural dimension of knowledge production and learning have been emphasized. Usable knowledge is generated in practice; that means (planning) practice is also a means of testing validity claims of knowledge (Campbell, 2012). This way of thinking about knowledge and knowledge generation ("the deliberative and reflective practitioner") is popular in the planning sciences (Schön, 1991). But, at the same time, this prevents stronger theoretical reflections. We share a view expressed by a group of authors in a contribution to *Planning Theory*:

> If planning theory has long concerned itself with the translation of knowledge to action (Campbell, 2012; Friedmann, 1987), we argue here that any response to unsettling times must reexamine where and how planning knowledge is produced, shared, and valued and how that affects the forms of action such knowledge makes possible. (Barry et al., 2018, p. 420)

In fact, many contributions fall short of a proper definition of knowledge and interpret knowledge as something that is used, owned, or contested. More complex definitions that would consider knowledge as cognitive orders or civic epistemology that stabilize cognitive expectations seem to be more appropriate and offer greater analytical capacity (Jung et al., 2014; Zimmermann et al., 2015). It seems that more generalized statements are possible when an appropriate theoretical reference is used. To give an example: living labs, seen from a theoretical perspective, are a type of *boundary arrangement*, i.e., a rules-based arrangement that works at the nexus of science-based expertise and other forms of knowledge (Hoppe, 2005). How this boundary arrangements evolve in planning practice and what the consequences are needs further scrutiny. Implicitly, this confirms that the attribution of stocks of knowledge to actors, organisations, or groups of actors is possible (and many notions exist: advocacy coalitions, epistemic communities, experts, social movements, networks, discourse communities). At least for the empirical study of knowledge in planning this seems to be highly relevant as these (collective) actors can be identified empirically (rather than knowledge as such).

To our surprise, the aspect of learning (as the process of adapting and changing knowledge claims or just skills) has found only scant attention in the contributions to the thematic issue (see, for different conceptions of learning, McFarlane, 2011, as well as Dunlop & Radaelli, 2020). In any case, knowledge integration still seems to be the main concern of the authors and it seems that there is—at least in planning—only one mechanism for this integration: communicative action as a way to test and negotiate different validity claims and knowledge forms. Other procedural perspectives have not been taken into account and organization science has a rich offer for operationalizations such as internalization, objectification, and externalization of knowledge (Tsoukas, 2005).

We also missed further reflections on complexity and uncertainty and, related to this, the crisis of (expert) knowledge (including fake news, etc.). Expert knowledge has lost a lot of its credibility but it seems that expert knowledge is still the main foundation for decision-making in planning. Research that sheds light on this would enrich the discussion on (spatial) knowledge and urban planning continued with this thematic issue.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

"DALSTON! WHO ASKED U?": A Knowledge-Centred Perspective on the Mapping of Socio-Spatial Relations in East London

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Abstract
Since the turn of the millennium, Dalston in the London Borough of Hackney has experienced fundamental change through public and private investment in new infrastructure and processes of urban restructuring. This was paralleled by the reform of the national planning system, which aimed to devolve decision-making to the local level and increase the possibilities for residents and stakeholders to participate in planning processes. However, the difficulty of translating local needs and aspirations into policy goals and broadly accepted area action plans resulted in a crisis, which, in 2018, led to the introduction of the Dalston Conversation and subsequently the revision of planning goals. It is in this context that the Relational States of Dalston mapping project generated and assembled local knowledge about the web of socio-spatial relations between different local actors and in this way highlighted the significance and fragility of the communities' networks and their spatial dimensions. The collection, ordering, integration, and production of knowledge can be seen as part of the core work in urban planning processes and policymaking. Which forms of knowledge are routinely used in planning contexts and define the relationship between planning action and urban transformation? To what extent could the mapping of local community relations add to this knowledge and help to improve decision-making processes in contested spaces of knowledge? In what ways could a relational understanding of space and architectural modes of research and representation contribute to the analysis, conceptualisation, and communication of local community relations? This article engages with these questions, using the mapping project in Dalston as a case study.

Keywords
East London; local knowledge; mapping; Relational States of Dalston; socio-spatial project; urban planning

Issue
This article is part of the issue "Spatial Knowledge and Urban Planning" edited by Anna Juliane Heinrich (TU Berlin), Angela Million (TU Berlin), and Karsten Zimmermann (TU Dortmund).

1. Introduction

In September 2007, when the burnt-out shells of the Georgian terraces at 60–64 Dalston Lane in the London Borough of Hackney (LBH) were demolished, the widely visible graffiti "DALSTON! WHO ASKED U?" (Figure 1) was also removed ("Run to ruin," 2016). It gave expression to public discontent with local policymaking and the processes through which decisions had been made by the authorities. The slogan was used in local campaigns that support communities, safeguard heritage, and work to enhance the quality of the urban environment in the Dalston area of Hackney. The Dalston Lane controversy lasted for almost two decades and was closely linked to other contested projects in Dalston, including the Dalston Junction infrastructure project and the Dalston Square development, as well as the recent proposals for Ridley Road Market and sites around Ashwin Street known as the Dalston Quarter. Critics of the dominant market-led redevelopment strategies in Dalston town

centre expressed concerns about the loss of the area's identity as a characterful, diverse, and vibrant place for people (OPEN Dalston, 2007a).

Figure 1. Key moment during the Dalston Lane controversy: Demolition of historically significant examples of early 19th century Georgian terraces on Dalston Lane after years of neglect and fire damage, 2007. Source: OPEN Dalston (2007b).

The Dalston case should be seen in the broader context of the substantial urban restructuring of the eastern part of London and the challenges faced by the city as a whole, as well as within the specific context of the LBH (Figure 2). Historically, the area today defined as the LBH has been a place of arrival and diversity. Its residents have different cultural and ethnic backgrounds, speak 89 different languages, and are members of different religious communities (LBH Policy and Insight Team, 2020, p. 12). The 2011 Census records Hackney's population at 246,300, of which around 40% come from Black/African/Caribbean/Asian/mixed ethnic groups (LBH Policy and Insight Team, 2020, p. 10). Hackney is home to large Turkish/Kurdish and Charedi Jewish communities (LBH Policy and Insight Team, 2020, p. 3). While ethnic, cultural, and social diversity are seen as a prime source of local pride in the borough (LBH Policy and Insight Team, 2020, pp. 3–4), rising costs of living and the lack of affordable space are putting local households, businesses, and cultural and social organisations increasingly under pressure (LBH Policy and Insight Team, 2020, p. 33) and are contributing to persistently high rates of deprivation (LBH Policy and Insight Team, 2020, p. 4). The Hackney Profile states that, while East London has become an "area of growing economic opportunity" (LBH Policy and Insight Team, 2020, p. 22), as a result of processes of economic concentration in Southeast Britain and local improvement of transport infrastructure and public services, "this growth sits alongside significant deprivation. Some local people continue to face persistent inequalities and are disproportionately affected by child poverty, worklessness and welfare dependency" (LBH Policy and Insight Team, 2020, p. 22). The coexistence of very different dynamics and problems in the LBH poses a major challenge for planning and policymaking, in particular where they directly affect the dense and often fragile web of socio-spatial relations.

The situation in Dalston exemplifies the difficulties in connecting local needs to planning action since the aspirations and issues at stake are diverse and difficult to identify, measure, and communicate. In the case of Dalston, the introduction of the Localism Act 2011, far-reaching national planning reform, and criticism and opposition from local stakeholders and campaign groups did not seem to result in more comprehensive planning processes and broadly accepted outcomes. This culminated in a crisis, which, in 2018, led to the introduction of the

Figure 2. Dalston town centre in 2017–2018. From top left to right: Kingsland High Street, Ridley Road Market, Ashwin Street, Dalston Square development, Dalston Eastern Curve Garden, and Rio Cinema.

public consultation, titled the Dalston Conversation (LBH, 2018) and subsequently to the revision of planning goals.

Knowledge is assigned a key legitimising role in urban planning contexts and decision-making in the public domain. If we assume that actors, organisations, and stakeholders use, produce, and relate to different kinds of knowledge forms and claims to knowledge, the processing of knowledge will not be straightforward in planning contexts and therefore is subject to contestation and negotiation. The complexity of urban situations seems to be mirrored by the complexity of knowledge both about and within urban conditions, especially if the focus is on the fine grain of socio-spatial relations at the neighbourhood level. Local community exchanges and their spatial dimensions are hard to grasp, making it difficult to communicate and evaluate the social values that are generated within their respective contexts. However, it is on this level in particular that the effects of urban planning and policymaking become entangled with everyday life in the most consequential ways, since multiple aspects of people's lives—including the social, environmental, spatial, and economic dimensions—may be directly affected.

In this article, we employ Dalston as a case study to connect the local perspective with the broader level perspectives of the production, control, and use of knowledge in planning and urban transformation. We discuss shifts in the demand for knowledge, in particular local and locally embedded spatial knowledge, before we present the project of mapping socio-spatial relations as a means of generating and processing local knowledge. In the final section, we expand the discussion about knowledge through a reflection on the transformation of knowledge during the mapping project.

2. Knowledge and Planning

Like architecture, urban design, landscape architecture, and other spatial disciplines, urban planning operates within transdisciplinary settings and conflict-driven spatial processes, while being closely related to the norms of policymaking and politics. In the following sections, we argue that the relationship between knowledge and urban planning has been subjected to repeated re-framing and adaptation, whereby the more recent changes resulting from diversification, digitalisation, and multiplication of knowledge, as well as from the polarisation of knowledge claims, have produced new conditions that are currently challenging urban planning practices and processes. We further argue that the cross-disciplinary sharing of histories of epistemic re-conceptualisation opened new possibilities for interdisciplinary work and the exchange of methodological framings. We will briefly introduce representations of forms of knowledge by Beecroft et al. (2018), Healey (2007), and Matthiesen and Reisinger (2011) before we discuss the more specific framings of knowledge as local knowledge and spatial knowledge, arguing that they could play a more decisive role in the development of locally grounded concretisations of planning goals. We conclude this section by drawing conceptual connections between local knowledge and Löw's (2016) theory of relational space.

2.1. Multiple Framings of Knowledge

The relationship between urban planning and knowledge is not static and has changed considerably since the dissolution of the modernist paradigm that entailed the questioning of knowledge as a reified object (Rydin, 2007, p. 52) together with the technocratic empiricist orientation in policy analysis (Fischer, 2003, p. vii) and "naïve objectivism" (Sayer, 1992, as cited in Brenner et al., 2011, p. 233). The "rational model" (Innes & Booher, 2014, p. 197) gave way to more complex understandings of knowledge. Philosophers and sociologists like John Dewey, Peter Berger, Thomas Luckmann, Jürgen Habermas, Michel Foucault, and Niklas Luhmann, among others, are understood to have influenced these shifts in epistemic orientation by offering their pragmatist, interpretive, constructivist, autopoietic, and critical perspectives to the conceptualisation of knowledge in planning theory (Healey, 2007, pp. 239–240, 244–245; Innes & Booher, 2014, p. 196; Matthiesen & Reisinger, 2011, pp. 96–97). This, in turn, required the revision of the formal and informal processes through which knowledge is gathered, constructed, distributed, justified, and communicated in planning and policymaking.

Different concepts have been developed to represent the multiplicity of knowledge together with the related actors, networks, and processes, be it as producers, brokers, or bearers of knowledge. Based on the understanding that dualist concepts like explicit/tacit knowledge capture only a part of the knowledge universe and its entanglements with power structures, processes, and networks, more complex concepts evolved such as "epistemic communities" (Haas & Haas, 1995, p. 261), "communities of practice" (Healey, 2007, p. 27; Wenger, 1998), or "discourse coalitions" (Hajer, 1993). They share the assumption that knowledge is socially produced, related to power structures, and mediated, and that different forms of knowledge and knowledge claims compete with each other.

Because knowledge is tied up with numerous institutional settings and modes of processing and production, its successive waves of reframing have contributed towards differentiation. Digitalisation and the growing significance of "*zone*[s] *of knowledge transactions*" (Matthiesen & Reisinger, 2011, p. 95, emphasis in the original) are considered a means of multiplying the amount and heterogeneity of knowledge produced (Matthiesen & Reisinger, 2011, p. 104), as well as controversies about the validity of knowledge claims.

Drawing from the analysis of different situations in which knowledge and action unfold in planning contexts, Healey (2007, p. 255) suggests that "policy groups, scientific teams or local neighbourhoods" are likely to

draw on different forms of knowledge rather than only one, whereby differences occur in the combination and mix of knowledge and the "processes through which what counts as valid knowledge and legitimate inference is established." Matthiesen and Reisinger (2011, pp. 97–98) speak of regional variations of "knowledge cultures" as defining the structural and interpretative framework for the translation of locally produced forms of knowledge.

The successive reframing of knowledge has established new epistemological intersections between disciplines, which has opened new possibilities for the cross-disciplinary application of theory, research methods, and thinking. Over the last two decades, modes of enquiry in urban research experienced significant changes through technological innovation and new methods of data generation, accumulation, and processing. At the same time, the possibilities for the methodological framing of urban research and analysis diversified, for example through the migration of theory/methods packages and multi-site research designs that integrate elements of urban ethnography (Schwanhäußer, 2016), assemblage theory and actor-network theory (Blok & Farias, 2016; Yaneva, 2012), grounded theory (Harnack, 2012), and social worlds/arenas and situational analysis (Kling, 2020).

2.2. Ordering and Integrating Knowledge

Urban planning and other spatial disciplines are increasingly challenged by the integration of knowledge produced by a growing number of specialist sub-disciplines, data generation processes, administrative requirements, and the opening-up of fields of urban practice. Different models have been conceived to structure and categorise these forms of knowledge. The model proposed by Healey (2007) in the context of strategic regional planning consists of four axes: explicit, implicit, experiential/practical, and systematised (Healey, 2007, p. 244). The quadrants contain forms of knowledge that draw from its two adjacent axes. "Local knowledge," for example, is positioned between the implicit and experiential/practical axes, while "good practice guides" are between the experiential/practical and explicit axes. Healey's (2007, p. 243) understanding of knowledge is closely linked to interpretive and constructivist perspectives, emphasising the relatedness of knowledge to action. "Knowing" is conceived as an activity, a process (Healey, 2007, p. 244). Accordingly, the category "practical engagement" is positioned at the centre and intersects with all quadrants (Healey, 2007, p. 245). The model implies the possibility of movement and stresses the co-presence of multiple forms of knowledge.

The categorisation of knowledge by Beecroft et al. (2018) is used in the context of processes of urban transformation and real-world laboratories. It distinguishes between systems knowledge, target knowledge, and transformation knowledge (Beecroft et al., 2018, pp. 79, 149; CASS & ProClim, 1997, p. 15).

The model developed by Matthiesen and the Leibniz Institute for Research on Society and Space aims at elaborating "a more adequate working concept of knowledge in technological, research, government *and* everyday life contexts" (Matthiesen, 2005, p. 4, emphasis in the original). Its flower-like shape initially integrated eight forms of knowledge. Matthiesen and Reisinger adopted this conceptual framework for the study of knowledge transactions in the Governance for Sustainability project (Atkinson et al., 2011) and expanded it to 10 forms of knowledge (Matthiesen & Reisinger, 2011, pp. 99–102):

1. Knowledge of everyday life;
2. Expert/professional/scientific knowledge;
3. Product knowledge;
4. Steering knowledge, including management and leadership knowledge;
5. Institutional knowledge;
6. Economic (market) knowledge;
7. Local knowledge;
8. Milieu knowledge;
9. Reflective knowledge;
10. "?," an open, non-specified form of knowledge that is represented as a question mark.

Within this categorisation, knowledge of everyday life and reflective knowledge are assigned special roles. Knowledge of everyday life is "serving as a resource of general reference and as a starting point of knowledge differentiation" (Matthiesen & Reisinger, 2011, p. 103). Accordingly, this form of knowledge is presented as the referential backdrop in the diagram. Reflective knowledge rests at the centre and overlaps with the other forms. It is defined as "a product of learning and evaluating of knowledge-in-action, coupling and re-coupling the whole process and the different knowledge forms involved" (Matthiesen & Reisinger, 2011, p. 103).

In a further conceptualisation, Matthiesen and Reisinger (2011, p. 105) cluster the different forms of knowledge within institutionalised settings and represent them as operationalised knowledge in action. The authors refer to the clusters as "knowledge domains," whereby they distinguish between (a) the "science, research and expert domain" (with an emphasis on expert/professional/scientific/product knowledge), (b) the "policy and governance domain" (with an emphasis on steering/institutional knowledge), (c) the "market domain" (with an emphasis on economic knowledge), and (d) the "life world domain" (with an emphasis on everyday/milieu/local knowledge). The work of each domain includes the collection, control, and storing of relevant forms of knowledge, while actions between the domains include the joint filtering, trading, and translating of knowledge, which is facilitated by the "media" (Matthiesen & Reisinger, 2011, pp. 105–106). Reflective knowledge is shown as a transversal category that spans above and between the domains.

Among the three models, Healey (2007) establishes the most direct and numerous conceptual links with design, while the models of Beecroft et al. (2018) and Matthiesen and Reisinger (2011) seem to offer various implicit options for such connections, in particular in the fields of target and transformation knowledge, as a further transversal category that relates different forms of knowledge with each other, or as a companion to reflective knowledge. From the perspective of architects, urban designers, and other design-related disciplines, the connections are of significance because large parts of their professional, research, and expert contributions are centred around design work. Theorising on the re-conceptualisation of design as a reflexive research practice, Buchert (2014, p. 20) speaks of an "understanding of the process of design as a particular form of knowledge production and as a projective practice, as a highly integrative and creative knowledge culture that combines various forms of knowledge with reflection and production." This idea is also present in "design build," "live projects" (Anderson, 2017), or real-world laboratories (Beecroft et al., 2018) in architectural education.

The models by Beecroft et al. (2018), Healey (2007), and Matthiesen and Reisinger (2011), as well as the concept offered by Buchert (2014), mirror the interrelatedness of knowledge and action. Their conceptual frameworks share the understanding that much of the knowledge involved in processes of urban transformation is located outside the institutionalised and formalised domain of planning. In the following section, we focus on the interrelatedness of knowledge and space, and on the conceptualisation and processing of local knowledge.

2.3. Local Knowledge and Spaces of the Everyday

From the perspective of knowledge theory, "DALSTON! WHO ASKED U?" could be read as the failure of the expert and institutional knowledge domains to identify and integrate relevant local knowledge through the political process and planning. The construction of "local knowledge" as a legitimate form of knowledge in European planning processes and policymaking is related to the broader shifts in basic assumptions about knowledge formation, democratic processes, and governance as mentioned above. The question of what counts as local knowledge is not fixed and is subject to agreement, negotiation, and controversy. Matthiesen and Reisinger's (2011, p. 98) multi-level approach and concept of "knowledge cultures" offers an interpretive framework for representing higher-level influences on local knowledge that is related to the ordering power of legal and institutional conditions, as well as cultures of governance and politics. Based on the understanding that forms of knowledge do not occur in isolation, Matthiesen (2005, p. 8) suggests that "local knowledge addresses locally situated forms of knowledge-based competencies, integrating more or less systematically fragments of different knowledge forms on the local level. This knowledge form operates in close contact to everyday and professional experiences." The forms of knowledge that are of particular relevance in this context are, according to Matthiesen (2005, p. 8), "knowledge of everyday life," "milieu knowledge," and "product knowledge." If knowledge is closely related to action, local knowledge will be discernible in actions performed on the local level, urban quarter, or neighbourhood, in particular in everyday activities, social relations, conflicts, processes, goods, materialities, and everyday spaces, including actions that establish and maintain translocal connections to broader discourses (Zimmermann, 2009, p. 60).

In this respect, spaces of the everyday qualify as prime sites for the analysis of local knowledge. If we assume that both knowledge and space are socially produced and that the production of space is based on processes of "spacing" and "operation[s] of synthesis" (Löw, 2016, p. 134), that is, positioning, connecting, and integrating, we may conceptually position the production of local knowledge in close proximity to the production of space, if not within the production of space itself. Producing local knowledge could then be considered an act of producing space. Löw (2016, p. 191) stresses that "the constitution of spaces in action" is a collective effort that "takes place in processes of negotiation with other actors." If, as Löw (2016, p. 191) continues, the "negotiation of power structures is an immanent aspect of this process" and if spaces of the everyday are affected by and closely related to macro-level processes (Lefebvre, 1961/2002, p. 141), the analysis of local spaces, knowledge and relations will not end with questions that are of local relevance but include political issues of broader concern. In this sense, the reframing of local knowledge production as a process of spatial production opens up modes of analysis that consider the relational aspects of knowing together with its spatial, social, and political dimensions.

3. Shifts in the Relationship of Knowledge and Planning in the UK

The Localism Act 2011 was adopted to "devolve greater powers to councils and neighbourhoods and give local communities more control over housing and planning decisions" (House of Commons, 2011, para. 2). It could be seen as part of the gradual process of decentralisation of governmental and administrative powers in the UK, as well as part of ongoing changes in the culture of governance and local decision-making towards more inclusive processes and higher levels of participation (Healey, 2007, p. 18). We argue that this shift went hand in hand with changes to expectations about the use of knowledge in planning, in particular local knowledge, its production and filtering, the negotiation of local knowledge, as well as the discursive formation of local "KnowledgeScapes" (Matthiesen, 2005, 2009; Matthiesen & Reisinger, 2011; Zimmermann, 2009).

3.1. Changing Demands on Local Knowledge

The summary of the bill of the Localism Act 2011 emphasised the expected mutual benefit for all parties involved in urban transformation, in particular investors, local authorities, and the local communities, based on the understanding that localised decision-making would produce better decisions about resource allocation and investment, ensure high levels of acceptance in the local communities, streamline planning processes, and reduce bureaucratic overheads (House of Commons, 2011). Addressing the problems that led to the reform, the Department for Communities and Local Government stated in the impact assessment of the proposed bill on housing supply, that "the planning system has been too top-down, marginalising local communities from decisions and causing delays to local authority plans" (Department for Communities and Local Government, 2011, p. 2). It also highlighted potential problems of authorship, local identification, and democratic responsibility caused by the partial rewriting of development plan documents through external inspectors (Department for Communities and Local Government, 2011, p. 2). Summing up the reform's objectives, the report stated the aim "to return control over planning decisions to local communities by allowing local authorities the choice to adopt plans which are the right reflection of local aspirations for development in their area, in line with national policy" (Department for Communities and Local Government, 2011, p. 2). However, critics observed that local governments continued to be highly dependent on grants controlled by the central government, which sought to maintain its powers through funding regimes in which local councils compete with each other (Harris, 2021; Pipe, 2013). They suggested that the promise of decentralisation and the reduction of administrative work has yet to be fulfilled.

Where mayors and new bodies of local representation were introduced, regimes of local governance did change. The legislation increased both the possibilities and responsibilities for communities and stakeholders to act more independently and be actively involved in local policymaking and planning processes. At the same time, council officials and elected mayors had to respond to increased levels of personal accountability as demanded by the act (Harris, 2021; Pipe, 2013). While local knowledge is often assigned the role of challenging and counterbalancing expert and institutionalised forms of knowledge within constellations of hierarchical organisation, it will have to contribute towards the legitimisation of far-reaching formal decisions and actions in the new planning situation, thus changing general expectations about its capacity, reliability, and grounding.

Furthermore, the devolution of power seems to have opened up new arenas in which different local communities and groups engage in conflict with and against each other over planning goals (Geoghegan, 2013). While conflicts continue to be present within the hierarchy of administrative and political powers, we may see a growing number of controversies on the horizontal level and within the local knowledge category. In such constellations, the idea of a single, homogeneous local knowledge gives way to more complex concepts in which different local groups confront and negotiate their respective claims. Analysis and mapping of "KnowledgeScapes" must then take this multiplicity into account both in terms of conceptualisation and methodology.

3.2. Crisis of Adaptation: The Dalston Case

The Dalston Quarter (LBH, 2017a) in Dalston's town centre (Figure 2) is home to a vibrant mix of community stakeholders, which have established themselves there over several decades. However, in 2017, the LBH put forward a narrowly framed public consultation about their plan to redevelop a number of Council owned sites in the Dalston Quarter, driven by pressures to capitalise on increased land value as a result of the Council's ongoing financial difficulties (Rayner, 2000). All sites proposed for redevelopment were occupied and used by rent-subsidised, cultural, and social enterprises, including the Arcola Theatre, Café Oto, Dalston Eastern Curve Garden, V22, Bootstrap Charity, and HCVS.

The Dalston Eastern Curve Garden is a small green space that has operated as a social enterprise since 2012 and is an example of an initiative valued by the community. The Council's proposals to displace the garden caused a considerable outcry, resulting in a successful campaign that established a case for the garden's community value. The final consultation report stated that many respondents felt "strong distrust in the motives of the Council" and that "the [consultation] document was deliberately written to be unclear…to allow for the introduction of commercial development to replace existing organisations" (LBH, 2017b, p. 11, para. 4.17) and that the "importance [of the Dalston Eastern Curve Garden] to the community had not been recognised" by the Council (LBH, 2017b, p. 9, para. 4.6). Due to the strong opposition, the Council eventually stepped back from its redevelopment plans and embarked on a second public consultation that ran between 2018 and 2020 and was titled the Dalston Conversation (LBH, 2018), with the aim to collect further local knowledge and engage in public debate.

4. Mapping Socio-Spatial Relations in Dalston

The research project Relational States of Dalston (RSD; Figure 3; Jungfer & Palmieri, 2019) aimed to gain an understanding of the "the complex inter-relation between place qualities and multiple space-time relational dynamics" (Healey, 2006, p. 542) and respond to the limitations of institutional knowledge in relation to socially produced spaces, which Healey (2006, p. 541) refers to as the "institutional challenge" in governance.

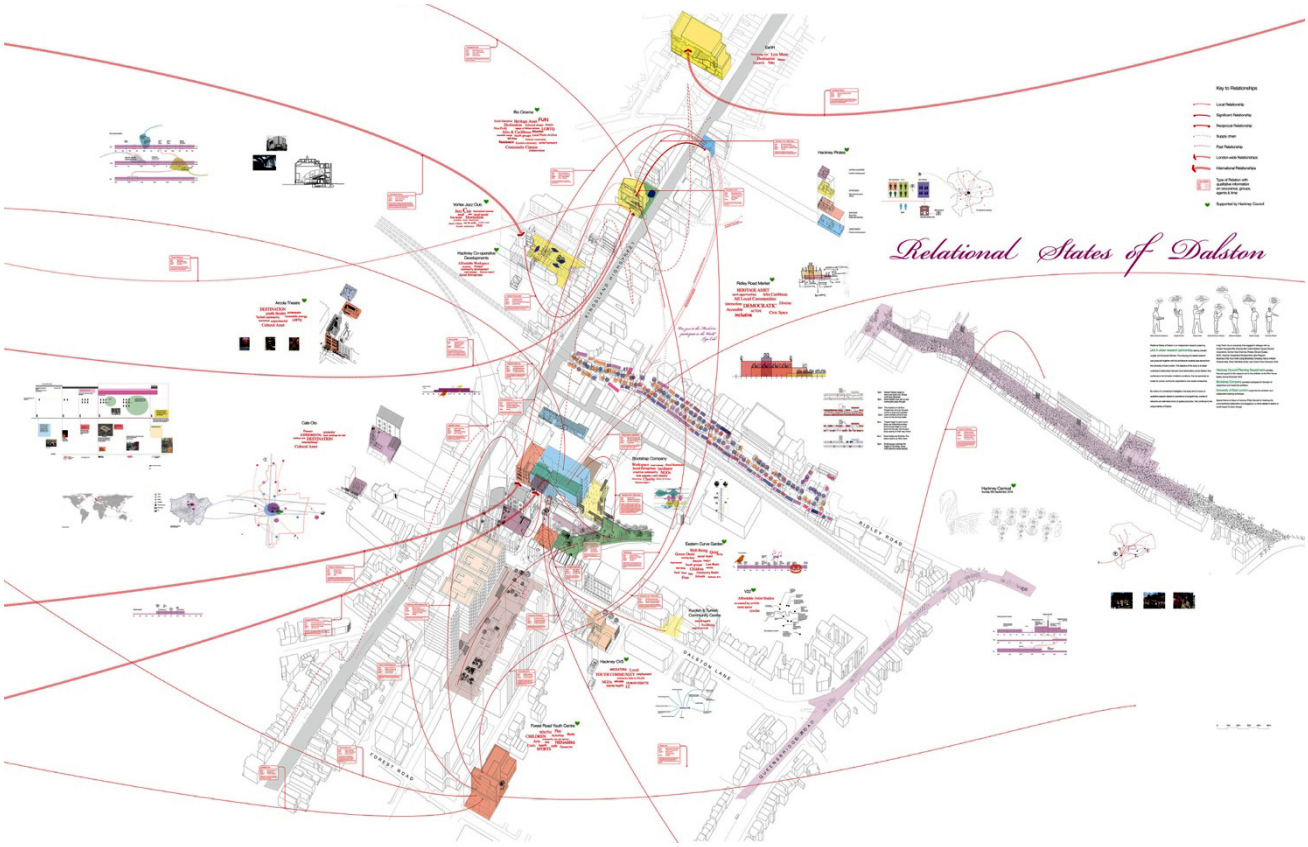

Figure 3. RSD map showing socio-spatial relationships between 15 community stakeholders across Dalston town centre: Axonometric drawing, original size 3.5 m by 2.4 m, third iteration, March 2019. Source: Courtesy of Unit A research partnership.

4.1. Starting the Mapping Project

Just before the launch of the Dalston Conversation by Hackney Council, design studio Unit A (Jungfer & Palmieri, 2019, p. 2) at the Architecture Department at the University of East London took the controversy created by the failed Dalston Quarter proposal (LBH, 2017a) as a starting point for an alternative design-led enquiry for the 2017/2018 academic year. Twenty-one architecture students were asked to engage with and research the stakeholders based in the Dalston Quarter, then threatened with displacement by the Council's redevelopment plans. The brief focused on the situation with an emphasis on locally rooted social-spatial relationships to discover local knowledge that would consequently inform the students' design proposals. The students' observations, findings, and the analysis of the stakeholders' everyday activities, spaces, social relations, conflicts, and connections were collated and translated into analytical spatial drawings and diagrams, which allowed multiple streams of information to be overlaid and visualised in context, building a collective socio-spatial understanding of the area. During this design research process, it became apparent that the actors' formal and informal activities produced formal and informal spaces, which actively shaped the urban environment, and that those different activities intersected and supported each other at various points in time and space, revealing the "necessity of a relational understanding of space" (Löw, 2016, p. xiii), especially in connection with dynamic processes of spatial production in urban conditions under change. The local knowledge, which was produced by students working with a relational approach, was recognised by members of Hackney's planning department when they saw this work at the end of the academic year. As a result, the Council commissioned the Unit A research partnership to carry out further research by expanding the study area from the Dalston Quarter to the Dalston town centre.

4.2. Local Communities and Urban Transformation in Dalston

The context in which the RSD project was commissioned was very specific and seemed to be defined by the conflict between two different modes of space production, one of which is profit-oriented and operates on a large scale, while the other is led by small scale initiatives, which draw on their local knowledge to unlock development opportunities within the specific social and spatial contexts of the area (Kling & Jungfer, 2018). The stakeholders threatened by displacement through the Council's controversial masterplan for Dalston Quarter in 2017 represent the small-scale agents of change, some of whom have been operating in

Dalston for nearly four decades, while the Dalston Lane renewal scheme and the Dalston Square development are representatives of the large-scale process of spatial restructuring. The Dalston Square development was an infrastructure-driven development completed in 2011 by Hackney Council, the London Development Agency, and Transport for London, in partnership with Barratt Homes, the largest residential property development company in the UK. It delivered the biggest redevelopment of the town centre, demolishing and reshaping part of the historic centre of Dalston, despite objections from the community and local heritage groups (OPEN Dalston, 2007a). More than a decade after completion, the mixed development still fails on the scale of the street to capitalise on the vitality of the town centre; thus, its merit and the value it brings to the local community are increasingly questioned.

The Dalston Quarter masterplan controversy in 2017 showed that the planners seemed to have an understanding of the concept of a large-scale market-led mode of space reproduction in practice but found it difficult to grasp the existing dynamics of the small-scale initiatives, their relational social-spatial complexities, and their significance for the quality of the town centre as a place for people. This awareness and the necessity to find new responses to the urban questions posed by the considerable urban changes in the area created the conditions in which the RSD project became possible.

4.3. Mapping Design Concept

If the significance of a place can be described as a relationship between cultural, social, economic, environmental, and spatial values, for local authorities that manage change through governance it seems critical to gain an inclusive understanding of an area prior to recommending interventions that support responsive, sensitive, and sustainable planning outcomes. Drawing from cultural heritage methodologies (Avrami & Mason, 2019), where understanding a place and assessing its cultural significance are the two first steps that should be taken prior to any policy development or recommendation, the main goal of the RSD project was to contribute to the understanding of Dalston town centre as a place and to assess the social and cultural significance of key locations in Dalston that are perceived as nodes for innovative culture, community organisations, and creative enterprises. In order to achieve this, the project proposed to research and map all social and cultural stakeholders interacting within a network of shared and coexisting programmes, where the collective diversity of place-stakeholder relations seemed to generate intrinsic value for the area and wider community.

Architectural tools of analysis and spatial representation, in combination with research instruments used in urban ethnography and other fields of qualitative research, offered the ability to survey, map and analyse. However, it was from the cultural heritage field that a methodology to evaluate the tangible and intangible qualities of the existing urban conditions was found, leading to the compilation of a list of assessment criteria, including activities (formal, informal, indeterminate), transactions, timelines, ownership, scale, grain, openness, access, inclusivity, uniqueness, rarity, destination, and vulnerability. This evaluation was then communicated with the map (Figure 4) through diagrams and tag clouds where words change in size and weight to represent their value at that moment and place.

The multiple method-based RSD mapping made use of the "relational complexities approach" (Healey, 2006, p. 542) and drew from "community mapping" (von Unger, 2014, pp. 78–83) and "live project" design pedagogy (Anderson, 2017) as ways to produce and exchange knowledge. The conceptual design also drew on a previous study of spatial production around Ashwin Street, Dalston (Kling & Jungfer, 2018), and proposed to engage in a "transdisciplinary understanding of urban knowledge," "situated knowledge of citizens," and local "knowledge cultures" (Giseke et al., 2021, p. 7) through co-production and collaboration between numerous community stakeholders, the local planning authority, and a higher education institution, with cycles of communication and consultation across all its different phases.

4.4. Relational States of Dalston: The Project

The research process evolved over five phases, whereby phases two to four advanced in a series of consecutive loops (see Figure 5).

4.4.1. Initial Access to the Field

This phase comprised a selection of stakeholder groups and sites that were perceived as vulnerable and acutely threatened by transformation plans. It also involved working with an open sampling approach. The expectation was that initial interviews would offer direction to further groups and stakeholders and, in this way, gradually enlarge and evolve the relational network.

4.4.2. Data Collection

Stakeholder organisations were visited and interviewed and key architectural spaces, their uses, their relationships with other stakeholders and the public realm, and wider community impact were surveyed and documented.

4.4.3. Contextualisation and Representation of Observed Relations

Observations, findings, and collected data were internally reviewed and discussed by the group of researchers at the same time as concepts were translated and contextualised using hybrid-drawing and graphical techniques over a scaled spatial axonometric map of the town centre.

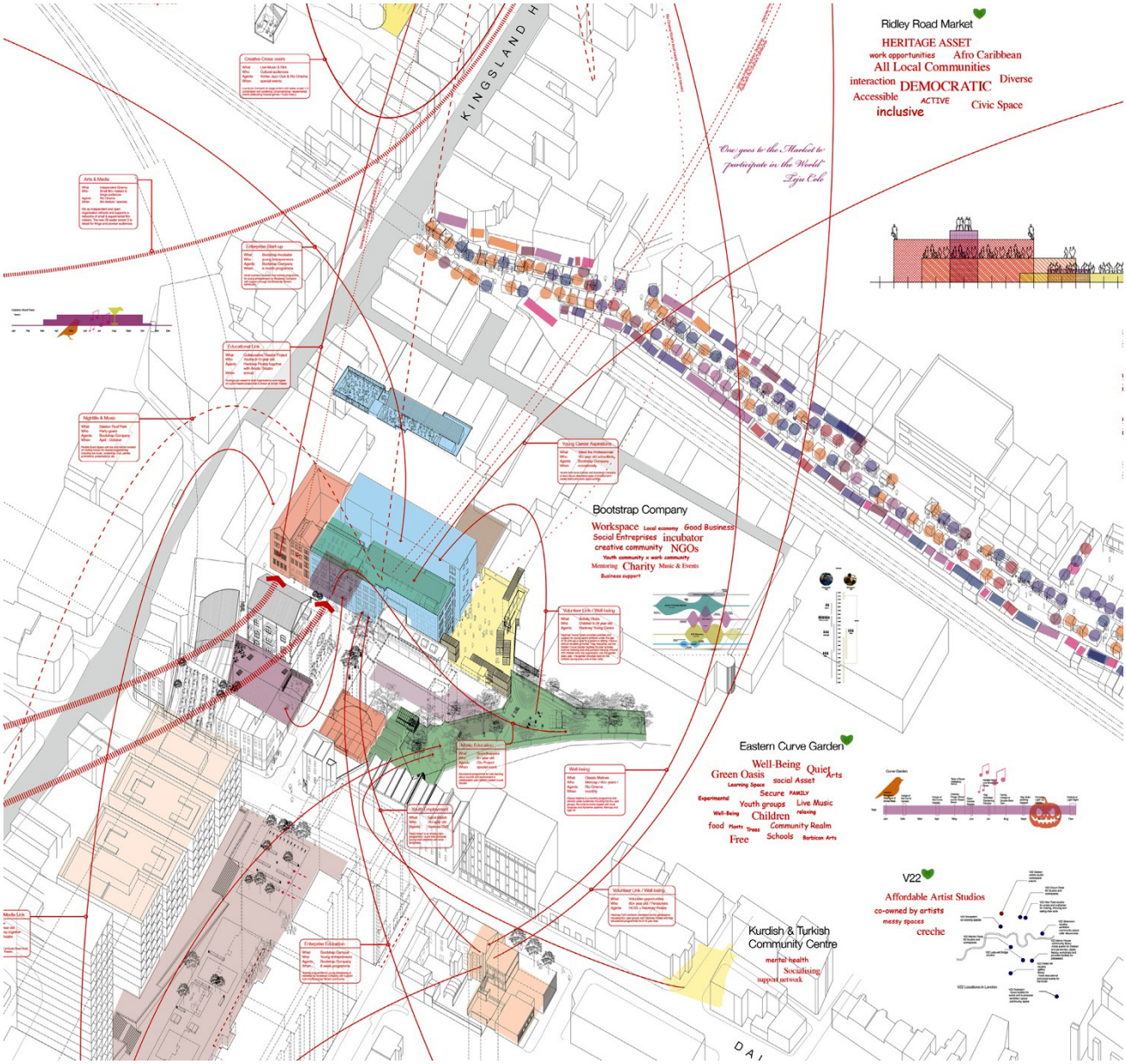

Figure 4. Extract from RSD map with stakeholder Bootstrap Charity's relations and activities across the Dalston Quarter using "tag-clouds" and Ridley Road Market that was found to have a significant status and which became subject to further research during 2019. Source: Courtesy of Unit A research partnership.

4.4.4. Consolidation of Interpretations and Representations

Stakeholder representatives were invited to participate in co-design drawing workshops to revise, debate, and draw over the initial drafts of the map. The map was continually reviewed, expanded, and amended, thereby collaboratively consolidating local knowledge.

4.4.5. Migration of Research Outcomes

The mapping outcome—a 3.5 m wide by 2.4 m high drawing—was formally presented to the Mayor of Hackney and members of the planning department and exhibited to the public on two different occasions. The first exhibition was at the Bootstrap Gallery as part of the research and consultation process, the second in a shop on the High Street as part of the Dalston Conversation consultation process. After a series of further iterations informed by the open exhibition feedback, the final drawing was integrated into the evidence base studies of the Draft Dalston Plan, a plan that sets out the spatial strategy to guide new developments and change in Dalston over the next 15 years (LBH, 2021).

The final drawing presents a non-linear narrative that synthesises multiple relationships between stakeholders (Figure 6). For example, Hackney Pirates, a social enterprise supporting children who are falling behind at

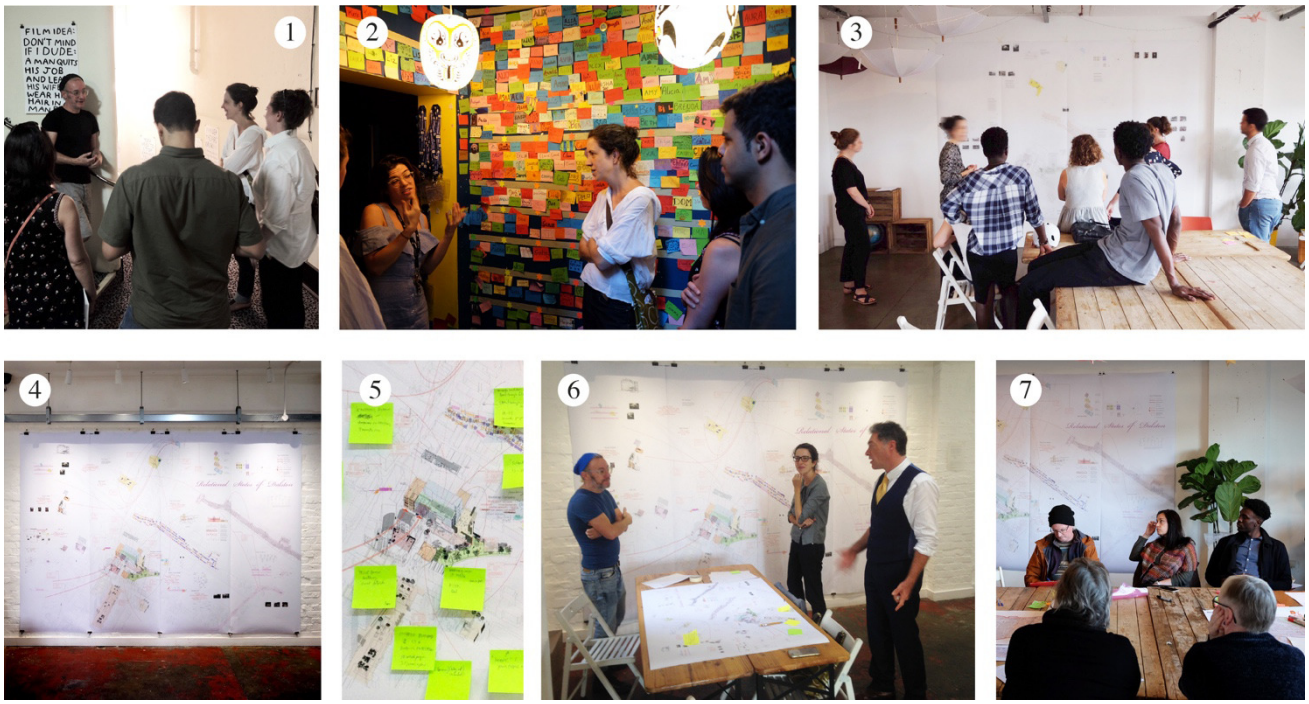

Figure 5. Documentation of engagement during the mapping process: The student researcher team interviews stakeholders, September 2018 (1 and 2); interim review with LBH in Dalston, September 2018 (3); public exhibition at Bootstrap Gallery, October and November 2018 (4); feedback workshops with stakeholders, October 2018 (5 and 6); the student researcher team participates in LBH's "Dalston Unique" stakeholder consultation event, February 2019 (7).

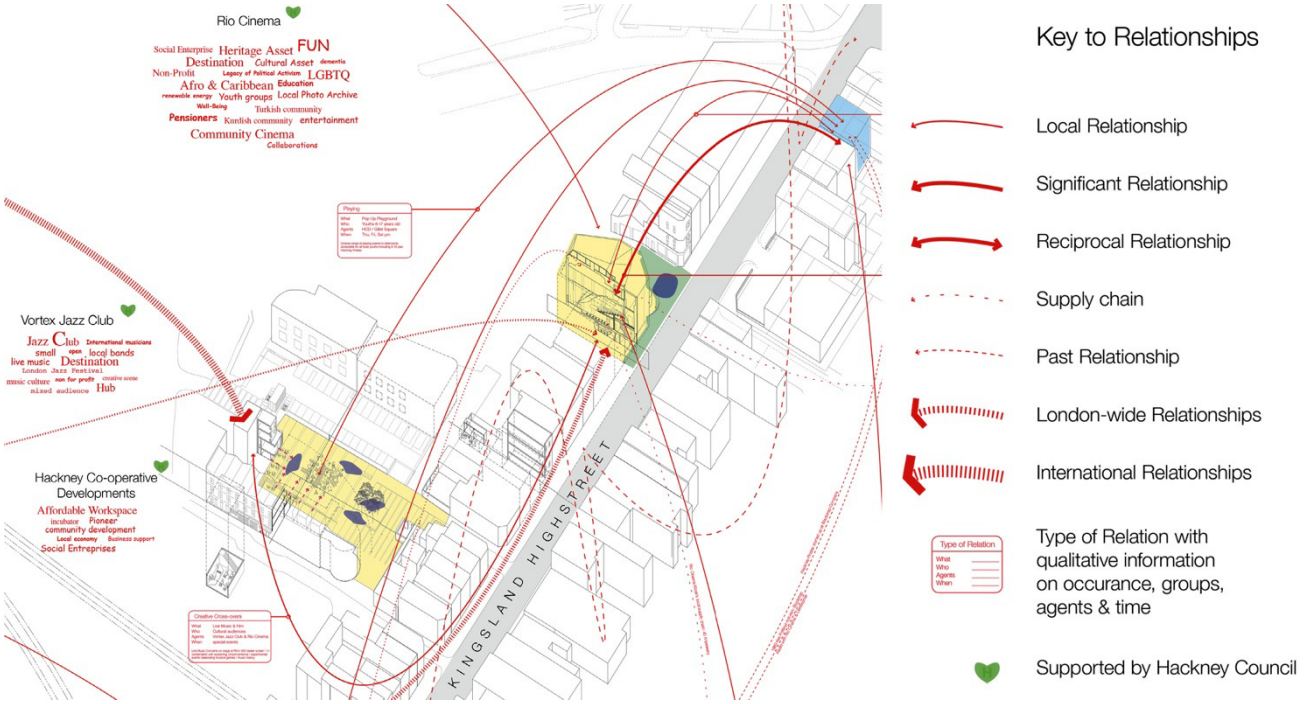

Figure 6. Detailed extract of RSD map showing labels with stakeholder information, including council subsidies, together with key to different types of relationships. Areas shown: Gillett Square and Kingsland High Street. Source: Courtesy of Unit A research partnership.

school, is based across the road from the Rio, a community cinema. Hackney Pirates works with local volunteers to provide one-to-one literacy support to the children, and the Rio Cinema puts on regular "classic matinees" that are popular with the elderly and an opportunity to recruit local volunteers. Also, films written and produced by the children are screened at the Rio Cinema, and a nearby partner sound studio records podcasts of readings of the children's stories and poems. The Arcola Theatre, just down the road, helps to produce and perform plays written by the children.

While the initial focus of the research was the Dalston Quarter, it became clear that Ridley Road Market, a daily street market that has existed for more than 150 years, was the most inclusive and most democratic territory in the town centre, serving "as an extended home to many" and "a place of community" (Stoll, 2019, p. 7). Its significance and high level of vulnerability against the pressures of private-market urban redevelopment in the area led to a shift in the drawing, placing Ridley Road Market at the centre of the map. The understanding of Ridley Road Market as instrumental in the anchoring of cultural, social, and community activities in Dalston was unexpected but crucial in the dialogue with the Council. Recently, responding to a long-standing campaign to Save Ridley Road Market (Save Ridley Road, 2019), which focussed on the opposition to the redevelopment of the privately owned and strategically located Ridley Road Market Shopping Village, the Council declared it an asset of community value. To ensure long-term affordability for market traders, LBH acquired the ground floor of the building (LBH, 2022).

4.5. Informing the Dalston Plan

In the published Draft Dalston Plan (LBH, 2021), the RSD project is listed alongside 25 technical studies commissioned by the Council. The RSD mapping drawing is reproduced in the chapter titled "Vibrant Dalston, Evening, Night-Time Economy, Culture and Safety," and, in wider parts of the planning document, the sensitive terminology from the RSD project has been adopted in reference to existing community stakeholders with the use of words such a uniqueness, identity, asset, inclusive, safeguarding, and vulnerability, among others. This was the result of various processes of knowledge exchange and institutional learning, involving meetings, workshops, presentations, reviews, and formal stakeholder consultation events. According to a member of the Council's planning team, an "in-depth understanding of networks" was gained, which was "informing future planning and regeneration decisions for Dalston town centre" (Hay, 2018). The Mayor of Hackney stated that "unconventional knowledge exchanges are in critical need in contexts of public debates relating to the social impact of urban development and gentrification" (P. Glanville, personal communication, October 17, 2018).

5. Migration and Transformation of Knowledge in Action: Reflections on the Process

In the following section, we draw on the empirical elements of the mapping project and the experience of the overall process to expand the earlier theoretical discussion about knowledge in urban planning contexts. The focus is on the dynamic nature of knowledge, its migrations, and transformations, as well as the relatedness of knowledge and knowledge producers and users.

5.1. Maps as Sites of Knowledge Encounters and Transactions

When the research team—consisting of students and teaching staff—entered the field with a mixed set of analytical and conceptual tools and research questions and preconceptions about the context in which their activities would be situated, they did so with different kinds of knowledge on board. The fieldwork included many direct encounters with community stakeholders and local organisations for interviews and discussions, or participant observations, as well as more indirect encounters through the study of the physical elements of spatial arrangements or the materialised traces of interactions. These encounters could be conceived of as the sites where knowledge transactions between different "bundles of knowledge forms" occurred (Matthiesen & Reisinger, 2011, p. 105).

The map produced in the RSD project assumed a special role in this process (Figure 3). Next to observing, the key work of mapping was related to selecting and abstracting, since not all of the data gathered or observed in the field was included in the final map. In this sense, the mapping equals the transaction process of filtering in which local and practical knowledge about socio-spatial relations is transformed into a more visible form of knowledge that can be shared and debated. If this supports processes of joint learning and empowerment, based on developing a better understanding of the social and spatial dimensions of local lifeworlds, as intended by the practical research approaches of "community mapping" (von Unger, 2014, pp. 78–83) or "live project" pedagogy (Anderson, 2017), the transformation of knowledge from one form to the other could be seen as an inclusive act. Since the bearers of local knowledge were actively involved in the research process, by providing essential information and feedback on the mapping and its evolution, they assumed active roles in both the "lifeworld domain" and the "science, research, and expert domain" (Matthiesen & Reisinger, 2011, p. 105).

We argue that the relational map could be seen as the vehicle, or "media" (Matthiesen & Reisinger, 2011, p. 105), through which the knowledge and the bearers of knowledge could make the transition. While action-centred models like social worlds/arenas emphasise that actors may participate in different social worlds at the same time (Clarke et al., 2018, p. 72), which in our case could be

the social world of producers of local knowledge and the social world of producers of expert knowledge, institutional frameworks, and social constructs set limits on such intersections between different knowledge domains.

5.2. Permeability and Rigidity of Boundaries

In their graphic representation of knowledge domains, Matthiesen and Reisinger (2011) use solid lines to define the boundaries of knowledge bundles, which could be read as the protective layers constructed by the respective domains. Here, we may draw parallels with earlier concepts in the sociology of knowledge, where the science-related knowledge domains have been traditionally associated with "boundary work" (Gieryn, 1983) or the maintenance of "protective belts" (Lakatos, 1978/2012). Matthiesen and Reisinger (2011, p. 105) suggest that among the different knowledge forms expert knowledge "has acquired the undisputed position of the meta-referee," since it asserts to deliver both the solutions to major problems and the instruments for their evaluation. Given the complexity of filtering mechanisms and boundary work, we can only speculate on whether a representation that differentiates between degrees of permeability would show the "science, research, and expert domain" and the "policy and governance domain" to be less permeable than the "lifeworld domain."

Referring to the economic and political relevance of expert knowledge, Matthiesen and Reisinger (2011, p. 100) suggest that the "expertise of professionals, administrators, planners and lawyers often becomes encapsulated into access-restricting exclusive knowledge cultures," a condition which they refer to as "knowledge regimes" (Matthiesen & Reisinger, 2011, p. 104) if it is coupled with excessive powers. They suggest that "these exclusive formations of knowledge are in constant danger of becoming too homogenous and too hermetic, therefore diminishing creativity and innovation" (Matthiesen & Reisinger, 2011, pp. 100–101). Hence, one of the main difficulties for organisations and actors, which operate with bundles of expert and other knowledge forms, is the definition of the right degree of permeability, or porosity, of their respective boundaries since they need to reconcile their institutionalised protective layers with knowledge exchange.

In the field of planning, rigid boundaries may result in difficulties to respond to change and develop an understanding of the less visible social and spatial processes and qualities affected by decision-making, whereas the waiving of all filtering is likely to cause problems with the justification of knowledge claims and the accumulation of data.

5.3. Closing and Re-Activating Processes of Knowledge Migration

In the case of the RSD project, the planning authority admitted the relational map—after stages of refinement, public scrutiny, and filtering—to the body of its institutionalised and formalised knowledge as a supplementary document to the Dalston Plan. According to one planner involved with the Draft Dalston Plan, it informed not only the final policy but was also used to strengthen the argument in internal discussions by making visible the existing web of local socio-spatial relations which was, until then, part of the common knowledge but inaccessible to other knowledge domains (B. Hay's interview with Fernanda Palmieri, March 3, 2022).

However, the moment of internalisation has effectively withdrawn the mapping from the domain in which it was produced. The transition has placed the project behind a protective layer that is maintained by the institutionalised mechanisms of filtering and access control. Since the mapping project took place, the constellation of actors in the administration has changed, not without consequences for the planning department's approach to knowledge production. For the time being, the continuation of projects that engage with local knowledge in the described way have become uncertain. Hence, we may speak of a condition of closure that results from the institutionalised fixing of knowledge as part of formalised planning processes, as well as the control of knowledge through shifts in the constellation of the "gatekeepers" (Matthiesen & Reisinger, 2011, p. 108) in the knowledge transaction zone.

Since knowledge is increasingly negotiated in semi-public or public settings (Matthiesen & Reisinger, 2011, p. 109) and the field of knowledge producers is diversifying and growing, the concluding question could be how the situation in Dalston may have to change in the future so that the continuous and intensive exchange between different knowledge domains and knowledge forms is seen as an integral necessity to enhance planning decisions and policymaking.

6. Conclusion and Further Research

Shifts in the cultures of governance and urban planning, as well as the ongoing diversification, digitalisation, multiplication of knowledge, and the polarisation of knowledge claims are producing new conditions, which are challenging urban planning practices and processes in the UK and other countries. Socially produced spatial relationships are difficult to understand and their significance difficult to evaluate. The RSD project contributed to the planners' and policymakers' understanding of the area but also invited local stakeholders and the wider community to reflect on the socio-spatial dimensions of the communities. The collective assembling and production of local knowledge, through mapping and exchange, drew from the participants' "capacity to 'see,' 'hear,' 'feel' and read the multiple dynamics of a place" (Healey, 2006, pp. 541–542). The mapping project experience demonstrates that the shared understanding of socio-spatial relations and local knowledge, and their integration into public discourses and

planning processes, could contribute towards the permeability of knowledge domains in planning contexts. Relational maps can inform public and institutional learning and perform as a "zone of knowledge transaction" (Matthiesen & Reisinger, 2011, p. 95) with the capacity to integrate different knowledge forms, discourses, and actors. Since mapping is an abstraction of the observed urban reality, its strength lies in the capacity to highlight specific aspects, and in this way include them in the shared bodies of knowledge that inform debates in different domains. At the same time, it excludes information and simplifies urban complexity. Hence, if integrated into planning action and policymaking, mapping becomes a political act.

The observed and mapped relations can be seen as part of large, densely constructed and never fully comprehensible socio-spatial networks that are at the basis of everyday life and which link the everyday with the urban and beyond. The models of knowledge under discussion emphasised the dynamic nature of knowledge transactions as well as the coevolutionary process that interrelates knowledge and space (Matthiesen, 2005, p. 2) and knowledge and society (Matthiesen & Reisinger, 2011, p. 94). Further research into relational mapping could address time as an object of analysis, looking at the changes in socio-spatial relations over time, for example, or as a question of representation. Another potential field for time-sensitive maps could be their operationalisation in scenario and strategic planning.

The growing recognition of conflict and agonistic conditions (Mouffe, 2013) as constituent elements of processes of urban transformation seems to call for a better understanding of the role of conflict in the production, filtering, and application of knowledge, including local knowledge. Further research into this topic could involve the application of conflict theory and analytical tools like the social worlds/arenas model or situational analysis (Clarke et al., 2018).

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Conflict of Interests

The authors declare no conflict of interests.

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Article

"Emancipatory Circuits of Knowledge" for Urban Equality: Experiences From Havana, Freetown, and Asia

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Abstract
Feminist, Southern, and decolonial thinkers have long argued that epistemological questions about how knowledge is produced and whose knowledge is valued and actioned are crucial in addressing inequalities, and a key challenge for planning. This collaborative article interrogates how knowledge is mobilised in urban planning and practice, discussing three experiences which have actively centred often-excluded voices, as a way of disrupting knowledge hierarchies in planning. We term these "emancipatory circuits of knowledge"—processes whereby diverse, situated, and marginalised forms of knowledge are co-produced and mobilised across urban research and planning, to address inequalities. We discuss experiences from the Technological University José Antonio Echeverría (CUJAE), a university in Havana, Cuba, that privileges a fluid and collaborative understanding of universities as social actors; the Sierra Leone Urban Research Centre, a research institute in the city of Freetown, which curates collective and inclusive spaces for community action planning, to challenge the legacies of colonial-era planning; and the Asian Coalition for Housing Rights, a regional network across Asia, which facilitates processes of exchange and co-learning which are highly strategic and situated in context, to advance community-led development. Shared across these "emancipatory circuits" are three "sites of impact" through which these partners have generated changes: encouraging inclusive policy and planning outcomes; shifting the planning praxis of authorities, bureaucrats, and researchers; and nurturing collective trajectories through building solidarities. Examining these three sites and their challenges, we query how urban knowledge is produced and translated towards epistemic justice, examining the tensions and the possibilities for building pathways to urban equality.

Keywords
Asia; co-production; epistemic justice; Freetown; Havana; knowledge translation; participation; planning; urban equality

Issue
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1. Introduction

Addressing deep, growing, and multidimensional urban inequalities requires a reframing of policy, planning, and governance, and how these are shaped by and relate to diverse urban knowledge(s). There is a growing acknowledgement of the necessity of engaging with historically marginalised groups, represented in discourses of

participation and co-production in planning and practice (Castán-Broto et al., 2015; Healey, 2006; Watson, 2014). Yet, if urban inequality is understood from a multidimensional social justice perspective (Fraser, 1995; Young, 1990)—beyond the (mal)distribution of resources to also include recognition, participation, and solidarity and care (Allen & Frediani, 2013; Levy, 2015; Yap et al., 2021)—this generates important questions for how we understand knowledge. Feminist, Southern, and decolonial thinkers have long argued that addressing "epistemic injustices"—or the systematic exclusion, misrepresentation, or undervaluing of particular knowledges, rationales, or geographies—is central to understanding inequalities (Fricker, 2007; Santos, 2014). Attention to epistemic injustice requires engaging with how knowledge is produced, whose knowledge is valued, and how different knowledge claims are negotiated. Such questions go beyond the "inclusion" of marginalised voices, drawing attention to deeply contested and power-laden processes through which diverse knowledges are (or are not) mobilised, recognised, and actioned.

What does it entail to work through multiple knowledge claims to challenge injustices? What are the challenges of working across diverse actors and contested histories, and the strategies to navigate these tensions? This article interrogates these questions through three experiences which have actively centred excluded or marginalised groups, as a way of disrupting hierarchies in knowledge production and promoting transformative urban practices. We term these experiences "emancipatory circuits of knowledge"—processes of co-producing and mobilising knowledges across research and practice, actors, and scales, with their emancipatory character lying in the capacity to build on often-invisibilised voices, to challenge historical and structural multidimensional inequalities.

This article discusses experiences from Havana (Cuba), Freetown (Sierra Leone), and across Asia. First, we examine how the Technological University José Antonio Echeverría (CUJAE), a university in Havana, Cuba, has engaged in practices of *collaboration and co-production*, which sees knowledge produced through practice, and through the interaction of traditional and non-traditional knowledge institutions. We see in this experience an "emancipatory circuit" which privileges a less linear, more fluid, and collaborative understanding of the role of universities as knowledge producers. Second, in Freetown, we explore how the Sierra Leone Urban Research Centre (SLURC) has supported processes of *community action planning.* This case offers an example of an "emancipatory circuit" which moves beyond apolitical and technical approaches to participation, to an approach which is deeply reflexive and seeks to address unequal legacies of colonial-era planning. Finally, we discuss the Asian Coalition for Housing Rights (ACHR) and the approach of this regional network in nurturing situated practices of *exchange and co-learning*. This example demonstrates an "emancipatory circuit" which challenges the idea of de-contextualized knowledge, policy transfer, or "best practices," to instead facilitate flexible learning processes based on mutual trust, common experiences, and the advancement of shared principles of action, as a way of building a collective identity. Though still deeply entangled in the legacies of inequalities, these three experiences unsettle assumptions within prevailing paradigms of knowledge and planning, revealing the possibilities for knowledge translation (Cociña et al., 2019) to generate emancipatory outcomes.

This article proceeds by firstly outlining the link between knowledge and inequalities, before defining "emancipatory circuits of knowledge." Second, we discuss the methodology and cases, outlining how these institutions challenge historical structural deprivations through multi-directional, situated, and political planning practices. Third, we identify three "sites of impact" in which these emancipatory circuits address a multidimensional understanding of urban inequalities: firstly, transforming material policy and planning outcomes; secondly, expanding the sites and understandings through which planning knowledge is produced by researchers and practitioners; and thirdly, changing the collective lives of those historically misrecognized groups involved in knowledge production. We discuss the shared strategies to mobilise knowledge towards these multi-layered outcomes, as well as their deep and enduring challenges. Finally, we conclude with a reflection on what these "emancipatory circuits" teach us about how urban planning knowledge can be produced and translated towards epistemic justice, and the lessons for building pathways to urban equality.

2. Centring "Knowledge" Questions: Epistemic Dimensions in the Pursuit of Urban Equality

2.1. Changing the Conversation: Towards Epistemic Planning Questions

The last few decades have witnessed increased efforts across disciplines to engage with questions of knowledge as linked with social justice. Looking at what Fricker (2007, p. 1) terms "epistemic injustice," some injustices are "distinctively epistemic in kind," in that they consist of "a wrong done to someone specifically in their capacity as a knower," through the devaluing or misrecognition of their experiences. Similar philosophical questions have configured a tradition which engages explicitly with global political economy, with Boaventura de Sousa Santos' work being crucial in this regard. In dialogue with decolonial discourses (Escobar, 2010; Quijano, 2000), Santos (2014) has called for *global cognitive justice*, grounded in an acknowledgement of the history of colonialism and oppression that renders certain types of knowledge invisible. He advocates for "epistemologies of the South," built on multiple *ecologies of knowledge* and *intercultural translations*, which have been historically

misrecognised by global structures and local institutions. Santos (2014, p. 212) defines an *ecology of knowledge* by acknowledging that "different types of knowledge are incomplete in different ways, and that raising the consciousness of such reciprocal incompleteness (rather than looking for completeness) will be a precondition for achieving cognitive justice"; and *intercultural translation* as the search for "concerns and underlying assumptions among cultures, identifying differences and similarities, and developing, whenever appropriate, new hybrid forms of cultural understanding and intercommunication." "It is time to change the conversation," Santos (2014, p. 2) claims in his provocative reading "against *epistemicide*," contributing to discussions of "epistemic violence" as crucial in the constitution of the colonial subject (Spivak, 1994).

These epistemic questions have been taken forward by the urban field in general and planning in particular. Building upon feminist notions of situated knowledge (Haraway, 1988) and ideas of collaborative planning (Healey, 2006), debates on planning within complexity have acknowledged that "experts cannot provide a complete response to the questions of planning" (Castán-Broto et al., 2015, p. 10), requiring the engagement of diverse types of knowledge through a "collaborative rationality" (Innes & Booher, 2010). Some of these discourses have gained traction under what has been called Southern urban theory—or the "South-Eastern" perspective, as termed by Yiftachel (2006). Likewise, there is a rising interest in the "co-production of knowledge" in urban research (Mitlin & Bartlett, 2018; Osuteye et al., 2019), and in radical, insurgent, or agonistic practices in extending planning beyond formal institutions (Frediani & Cociña, 2019; Legacy, 2017; Miraftab, 2009; Thorpe, 2017). These debates have had a correlation with the active efforts of grassroots groups and allies to promote locally produced knowledge–through self-enumeration, surveyorship, and mapping—as valid sources of urban knowledge (Boonyabancha, 2005; McFarlane, 2006; Mitlin & Satterthwaite, 2007).

These traditions have called for the production of knowledge and theory that is relevant for cities and sites outside of dominant academic circuits. In doing so, they challenge at least three key assumptions about knowledge that often inform the mainstream planning landscape.

First is the idea that there is a *linear relationship between research and practice.* This assumption has been challenged by practitioners and scholars openly questioning the schism between planning research and practice (Balducci & Bertolini, 2007; Porter, 2015; Whitzman & Goodman, 2017) and by the growing acknowledgement of the multiple sites of knowledge production—emergent from lived experience, practice, or cultural traditions—seeking theory produced *from* place and *through* place (Bhan et al., 2018).

The second assumption relates to an *apolitical understanding of knowledge, abstracted from the unequal global circuits of knowledge production*. Similar to what feminist theory has done in terms of questioning the rationalities and structures of knowledge production from a gender and race perspective (Ahmed, 2004; Fraser, 2013; hooks, 1991), Southern approaches have sought to historicise knowledge by contesting the universality of inherited and dominant planning theory, exploring how these rationalities have contributed to the extension of capitalism and colonialism (Lawhon & Truelove, 2020; Roy, 2009; Watson, 2009). Substantially, scholars have called "to theorise from practice and to engage in empirical work based in contexts where conventional planning theory has had little relevance" (Parnell et al., 2009, p. 237). A Southern approach calls for a distinctive approach to knowledge that challenges the universal and linear character that underlies the notion of "development," acknowledging *different trajectories* of modernisation and urbanisation (Santos, 1979), recognising what has been termed "plural modernities" (Sintusingha & Mirgholami, 2013) or the "pluriverse," as an ontological tool for "reconstructing local worlds" (Escobar, 2018, p. 4).

Finally, these traditions have challenged the idea that *knowledge can be de-contextualised*, and therefore *can be transferred universally across scales and space*, a key assumption in debates on policy transfer and mobility (McCann, 2011; Peck & Theodore, 2015). Conversely, there are calls to "provincialise" urban theory, querying the localities (i.e., Northern cities) through which dominant theory has been produced and how well this travels to the "urban majorities" shaped by very different political and material conditions (Leitner & Sheppard, 2015). This position calls for an approach to knowledge that engages with the specificities of urbanisation and planning practices in cities and how these travel (Harrison, 2006; Watson, 2002; Yiftachel, 2006).

2.2. Urban Equality from a Knowledge Perspective: Searching for Emancipatory Circuits

In this article, we advance on these discussions by looking at epistemic questions from an urban equality perspective. Based on seminal social justice work (Fraser, 1995; Young, 1990), we understand urban inequalities not only in terms of *material deprivations*—a lack of adequate income, shelter, infrastructure, or services—but also by structural conditions which shape the possibilities for the *reciprocal recognition* of multiple identities, *parity of political participation*, and the strengthening of *solidarity and care* practices across diverse social groups (Allen & Frediani, 2013; Levy, 2015; Yap et al., 2021). We argue that bringing these epistemic interrogations to the discussion of urban inequalities across these four dimensions generates critical questions for planning:

- Which experiences of material deprivation are treated as evidence for *redistributive* actions, and what blind spots or gaps exist in policymaking and planning?

- Whose priorities, rationales, practices, or worldviews (i.e., understandings of "progress" and "development") are *recognised* and actualised in policy and planning, and whose intersectional identities are rendered invisible in those processes?
- Which voices are considered valid in *participating* in decision-making, and what institutional capacities exist to engage with diverse knowledges, embracing and addressing conflict in democratic practices?
- How are relations of *solidarity and care* supported and valued in planning, shaping collective values in organising, friendship, care for nature, mutual aid, respect, and trust?

We posit that examining the strategies—and the assumptions which underpin them—through which diverse forms of knowledge are mobilised across these four dimensions is key to transformative city-making. We explore this proposition through the notion of "emancipatory circuits of knowledge," examining three grounded practices.

3. Emancipatory Circuits of Knowledge: Methodology and Cases

Knowledge is produced, translated, and mobilised in layered ways, shaping how cities are planned, produced, and inhabited. In this article, we look particularly at those "circuits" that amplify, validate, and activate often-invisibilised or excluded expertise, experiences, or practices, as a way of challenging traditions of exclusionary planning. These circuits entail the movement and translation of knowledge across research and practice, through forms of curation or encounter which speak across diverse actors and knowledges and are aimed at particular sites of impact. We understand these circuits to be "emancipatory" where they entail the intentional redistribution of resources and authority and seek to address multiple dimensions of inequality: *redistribution*, *recognition*, *participation*, and *solidarity and care*.

These inquiries have been carried out within the Knowledge in Action for Urban Equality (KNOW) programme, which co-produces research, and builds capacities and action with local partners to inform policy, planning, and practice for more equitable cities. This article draws upon a collaboration with CUJAE, SLURC, and ACHR. These partners have co-produced knowledge with urban poor and grassroots groups, collaborating with diverse stakeholders to impact policy and planning changes which address structural inequalities. The analysis presented here draws upon interviews, focus groups, workshops, and policy and document reviews in each locality, using a historical approach to trace "knowledge translation" strategies in advancing urban equality, including how: CUJAE as a university actor has co-produced knowledge and articulated actors and practices towards more equitable urban policies, ACHR as a regional network has facilitated knowledge and learning on community-led development, and SLURC as a research institute has collaborated to support informal settlement upgrading. Following the conclusion of fieldwork activities, individual and collective workshops were held with each partner to reflexively discuss, compare, and exchange the understandings of the link between knowledge and inequalities, the specific practices undertaken to co-produce knowledge, what make these circuits "emancipatory," and enduring challenges.

3.1. Havana, Cuba

CUJAE, the Technological University of Havana, like all universities in Cuba, has an explicit public mandate to engage with current social challenges. An interdisciplinary group, KNOW–Havana was established to examine the implications of a "prosperity with equality" approach and participatory planning in Havana. In the context of deep socio-economic transformations in Cuba, KNOW–Havana seeks to co-produce research-based outputs with a range of key actors and collaborations, to contribute to urban equality struggles. To do so, the team has worked across several themes (including social inclusion, health, energy, food, mobility, habitat, and economy), identifying the manifestations of existing inequalities, finding resources to tackle them, establishing collaborative partnerships, and co-conceiving transformative strategies.

CUJAE's approach has entailed practices of *collaboration and co-production* that move beyond the traditional role of the university as a service or knowledge "provider," challenging how outreach activities and partnerships are usually framed around notions of authority and expertise. An explicit aim of KNOW–Havana has been to translate the co-produced knowledge into recommendations for current urban management and policy tools (i.e., Cuban National Urban Agenda and municipal development strategies). This interdisciplinary work has entailed identifying strategic collaborations and undertaking collaborative research activities, including workshops in selected neighbourhoods, focus groups and interviews with diverse actors, site visits, student-led work, the co-production of urban instruments (i.e., the municipal development strategies and Destraba neighbourhood plans), and the establishment of the National University Urban Forum.

Since the opening of higher education to universal access in 1959, knowledge has been a question of equality for Cuban universities. What KNOW–Havana does, however, is to engage with the *process* of knowledge production as an equaliser in its own right, showcasing a more fluid relationship between research and practice. As reflected by Jorge Peña-Díaz (CUJAE):

> Access to knowledge is an equaliser, and the university has an important traditional role in this regard.

> But sometimes it needs to innovate in order to be truly transformative, through collaborations that connect elements and institutions, highlight the relevance of certain knowledges, and intersect personal and collective trajectories.

KNOW–Havana uses its leverage as a university actor to build an "emancipatory circuit of knowledge" through research *co-production and collaborations* that mobilise multiple views, experiences, and types of knowledge, creating valid and valuable narratives in decision-making spaces. Acknowledging that full co-production is not always institutionally and politically possible, the research group has strategically adopted four distinctive "modalities" of engagement: a more traditional role as a "connector" of academic knowledge with processes and institutions, as with work done around sustainable mobility in collaboration with Havana transport authorities and international actors and networks during the last decade (Morris et al., 2019); as a "broker," establishing dialogues between communities, authorities, and other actors, as with work in a small public space in Los Sitios that involved community participatory design workshops and active citizen engagement, especially with youth and children; as a "plug-in," in which CUJAE connects itself to existing processes, accelerating or highlighting certain agendas, like the development of capacity building workshops and planning proposals for the ongoing development planning of the Havana Bay; and in a more aggressive "trojan horse virus" role, getting involved at the core of existing urban processes, injecting more radical ideas about equality, like the case of the current development of a municipal development strategy led by CUJAE and co-produced around the notion of "prosperity with equality." Across these multiple roles, CUJAE has extended or even subverted the notion of "university expertise," demonstrating an "emancipatory circuit" that challenges the directionality of knowledge, seeking to redistribute authority and resources, while widening the recognition of multiple worldviews.

3.2. Freetown, Sierra Leone

Established in 2015, SLURC generates capacity building and research in cities across Sierra Leone, focused on the well-being of residents of informal settlements. The centre has played a key role in co-producing knowledge, connecting diverse local and international stakeholders, and making urban knowledge available and accessible to influence urban policy and practice, to respond to the priorities of informal settlement residents (Lynch et al., 2020). Its focus is on "bridging the knowledge gap between policy producers, and those who suffer the consequences of the policies" (Joseph Macarthy, SLURC). Knowledge is understood as a crucial resource linked with inequalities, with SLURC supporting the production and framing of missing narratives in ways that are more inclusive and actionable by authorities.

SLURC has helped build an "emancipatory circuit of knowledge" particularly through the curation of collective and inclusive spaces for research, engagement, and action. An example is the Community Area Action Planning (CAAP) process, in collaboration with grassroots members of the Federation of the Rural and Urban Poor, local NGOs, such as the Centre of Dialogue on Human Settlement and Poverty Alleviation and the Sierra Leone Young Men's Christian Association, and international groups, such as Architecture Sans Frontieres UK. The first CAAP process entailed workshops within two communities, Cockle Bay and Dworzark, focused on participatory design and planning, to develop upgrading plans to advocate for more inclusive city-making with local authorities (SLURC, 2018). Building on this precedent, in 2019 the KNOW/SLURC collaboration established a City Learning Platform, and a series of Community Learning Platforms, two interconnected governance structures which bring diverse urban stakeholders to meet periodically and discuss challenges and strategies facing informal settlements (City Learning Platform, 2019). Inclusivity is encouraged through safeguarding participation of key social groups, for instance, across gender, age, tenure status, religion, or ability, particularly in the formation of Community Learning Platforms, to recognise the diversity of men and women in the settlements they represent. This commitment to the curation and establishment of new governance structures builds on the long history of collaborative planning with informal settlement residents, seeking to address inequalities embedded in the legacies of colonial-era planning.

Crucially, these experiences have sought to challenge the tokenistic or apolitical ways in which "community participation" usually occurs. As described by Joseph Macarthy (SLURC):

> When we started, the focus was on partnership: promoting strong collaborative relationships with communities and government entities. But upon reflection, we saw just partnering was tokenistic. We wanted to go beyond that. To make participation effective, we needed to first empower the residents that normally bear the consequences of policy decisions. *Participation can only become emancipatory if it is linked with empowerment.*

Thus, through the grounded practices of *community action planning*, SLURC has sought not only to enhance "participation" in discrete planning spaces, but also to build and support the capacities of informal settlement residents to produce research, increase public confidence in the quality of the outputs, and work with local authorities to reflect upon inequalities embedded in the planning system, and to make use of alternative types of knowledge. This interrogation of the groups and ideologies which have historically framed and led planning agendas demonstrates an "emancipatory circuit" which seeks to increase participation and redistribute

resources in knowledge production, in ways that address structural inequalities.

3.3. Asia

The ACHR is a regional network of grassroots organizations, NGOs, and professionals established in 1988, involved in community-led models of poverty reduction and development. At its core are shared tools for community organisation for access to secure land tenure, housing, and finance, from community savings groups, enumerations, and profiling to the collective purchase of land and housing construction. Network members have collaborated on, learnt from, and adapted community-driven innovations across the region. These innovations have included models such as the Baan Mankong programme in Thailand (Boonyabancha, 2005); improved low-cost infrastructure of the Orangi pilot project in Pakistan (Hasan, 2006); the Community Mortgage Programme in the Philippines; or settlement upgrading of the Kampung Improvement programme in Indonesia (Silas, 1992). Lessons from these initiatives were consolidated regionally through the large-scale Asian Coalition for Community Action programme (2008–2014), which provided grants and loans for community-level infrastructure and housing projects, supporting residents to engage in city-wide organising, mapping, partnership development, and prioritisation, and the negotiation of land across 215 cities (Boonyabancha & Mitlin, 2012). Crucial to ACHR's ethos is the flexible use of these tools, which are adapted across contexts, taking as its base the recognition of the similar structural drivers and experiences of inequalities. Shared is a set of core values around seeing urban poor communities as the central problem-solvers, supporting them in the development of localised innovations, and working closely with authorities where possible to draw from the expertise of all local partners. ACHR groups primarily support the leadership and capacities of women, but also focus on engaging diverse social groups in community action. The ACHR/KNOW collaboration at the regional level has focused on the history of the network, examining the strategies for how the collective has built and shared actionable knowledge.

The ACHR network has built an "emancipatory circuit of knowledge" linked with practices of exchange and co-learning, facilitated through regular events or interactions, such as regional and international meetings and exchanges. Rather than sharing "best practices" or "policy recipes" to be transferred across the region, these forms of learning are politically strategic, deeply situated, and relational. In the words of Somsook Boonyabancha (ACHR), Secretary-General of ACHR until 2021:

> If city officials, urban poor leaders, and technical staff go together to see something positive in a different country, they learn it together. They have discussions and share amongst themselves. This will be a very powerful learning—*a joint learning process*—between actors who are supposed to do the same thing, but normally do it with different, and sometimes antagonistic, attitudes.

Exchanges might include delegations of urban poor leaders, progressive local authorities, and NGO or technical staff to learn from "successful" housing, land, or infrastructure projects elsewhere in the region, and are often linked with politically strategic moments when the prestige of an exchange visit can be leveraged to press for policy or practice change. Other practices entail the representation of voices of the poor at international forums, organising "high-level" meetings and using "outsiders" presence to attract and negotiate with authorities, or supporting the education and training of young professionals and bureaucrats to challenge disciplinary pedagogies. Learning can also operate in reverse: with members of well-established—but sometimes stagnant—collaborations taken to cities with newly formed collective action, to re-visit and learn from the energy, adaptation capacity, and innovation of emerging processes. These reversals of the directionality and hierarchies of knowledge production are also demonstrated, for instance, in supporting local authorities to learn from communities on how to address urban informality challenges.

While co-learning and sharing may generate changes in policy and planning, its value lies firstly in building collective inspiration, courage, confidence, and trust across urban poor groups and allies. This relational form of learning is strongly linked with the emotional dimensions of the network, referred to variously by members as a sense of friendship, shared values, or providing a spiritual connection or "soul" for groups in the region. Therefore, this "emancipatory circuit" prioritises contextualised learning as an active process designed not only to communicate information and tools, or to "transfer" techniques for change, but to build a sense of collective solidarity and recognition as a crucial route to addressing inequalities.

4. Discussion: Cross-Cutting Strategies and "Sites of Impact" of Knowledge Circuits

Though operating in very different contexts, across these three "emancipatory circuits of knowledge" are three layered "sites of impact" through which these partners have generated changes towards urban equality. This section explores the shared strategies, as well as challenges faced in expanding the room for manoeuvre for marginalised groups. In different ways, these sites offer opportunities to address epistemic questions across the four dimensions of equality: redistribution, recognition, participation, and solidarity and care.

4.1. Transforming Policy and Planning: Curating Institutional Spaces to Leverage and Reframe Resources

This first "site" is often conceived as one of the main outcomes of knowledge translation—referring to concrete

changes in policy and planning that better respond to excluded groups. Across these three partners is a common approach, using their institutional positioning and role as facilitators to strategically curate, transform, or expand governance structures, platforms, and resources, in ways that give space for usually misrecognised forms of knowledge to influence action.

CUJAE, for instance, has played a key role in leveraging and redistributing university resources. Sometimes, its main resource is "authority," due to the explicit recognition by the Cuban government of universities' social role (Díaz-Canel, 2021). This can be used to validate community-generated knowledge, for instance, in informing the municipal development strategy from an equality perspective. Resources can also include the contribution of time and physical space or relying on students and academics that are connected with certain neighbourhoods and urban processes. And, on occasion, "the main resource can be as simple as organising a proper meal at the end of a workshop, to ensure a dignified environment for building trust and relationships" (Jorge Peña-Díaz, CUJAE). For SLURC, their contribution rests on the assertion that multiple kinds of knowledge were already being produced within the city, but that it was not always "useful, usable, and used" (Braima Koroma, SLURC) by policymakers. Within this context, SLURC's efforts to curate institutional spaces such as the CAAP and Learning Platforms have been coupled with activities to build capacities and translate knowledge into "actionable formats"—whether reports, policy briefs, or working group inputs—which are produced inclusively and can speak to policymakers. And in the case of ACHR, working at the regional and international level has been strategically used to demonstrate that collaborations between communities, local governments, professionals, and other local stakeholders can bring about change in land, housing, or urban services. These exchanges are used both to "unstick" or inspire action in other cities and to make the case for embedding support systems for community-led development in policy and planning. These three cases reveal the importance of alliance-building for the institutionalisation of knowledge co-production, and the role of knowledge intermediaries in using their positioning to advocate for material changes in policy and practice.

Leveraging on strategic political moments, available resources, or opening up institutional structures is fundamental to the recognition of often invisibilised knowledge circuits. However, partners highlighted that long-term trajectories based on patriarchal, vertical, hierarchical approaches to planning and policy-making remain difficult to challenge. As outlined by Joseph Macarthy (SLURC), for knowledge co-production to sustain transformation over time, it requires policymakers and authorities to accept a loss of authority:

> Public institutions have their own ways of thinking and acting in silos….As long as they keep from giving out information, they are in control of resources and management. Starting to engage means giving up some level of power, and particular interests could be at risk. So, how do you convince them?

Likewise, while each of the partners explicitly engage with diverse community members in co-production processes, a lack of gender parity within local authorities, universities, or private sector partners has created challenges for addressing entrenched gender norms within key decision-making institutions. Sometimes these challenges have been difficult to address even within the structures set up by the partners themselves, requiring reflective and active labour to challenge deeply embedded gender or racial disparities. Beyond working closely with groups and institutions usually left outside official planning discussions, sustained institutional change requires building capacities of individuals and institutions to embrace research and knowledge produced by different sources, addressing identity imbalances, supporting emerging local leaderships and processes of co-production, and building opportunities for long-term resourcing of emerging platforms.

4.2. Expanding How Researchers and Practitioners Understand and Produce Planning Knowledge: Methodologies for Changing Praxis

A second shared strategy relates to approaches explicitly designed to destabilise the traditional sites, hierarchies, and directionalities of planning knowledge. Across the three cases, this has materialised through processes and methodologies which recognise, mobilise, and centre the expertise of urban poor or marginalised communities, while also actively supporting researchers and policy-makers in the reflexive examination of historical exclusions. These activities open up a "site of impact" related to the changing perspectives and actions of researchers and practitioners—or "praxis"—in the process expanding the remit of planning.

For ACHR, for instance, efforts to shift praxis are clearly seen within the methodologies of exchanges and city-wide co-creation workshops, which are designed to support multi-directional and mutual learning, collective planning, and design. Working in "mixed teams" of professionals, city officials, traditional or cultural authorities, and urban poor groups supports the reciprocal recognition of diverse knowledge sources, acknowledging that sharing across "technical" and lived knowledge are required for change. These efforts towards "joint learning" are explicitly designed to change the perspectives and practices of groups that may not normally work together, as much as they are about communicating technical information. Likewise, the work of CUJAE in Havana has challenged the directionality of university-led capacity building, learning, and exchange by building co-production partnerships that challenge traditional hierarchical definitions of the "experts" or

"learners," seeking fluid ways of producing urban knowledge across the public, civil society, and higher education institutions. For SLURC, this has entailed building capacities of urban poor groups such as the Federation and partner NGOs to engage in participatory action research with the direct involvement of public and academic institutions, expanding their "participatory capabilities" to engage in reflection and action together (Macarthy et al., 2019). These approaches ask important questions about where planning knowledge is produced, who is framing and leading planning agendas, and how co-production happens across stakeholders with differential access to resources and authority.

Despite expanding alternative planning imaginaries, partners highlighted individual and institutional challenges in destabilising traditional mechanisms of knowledge production. For instance, both SLURC and the regional work of ACHR often rely upon international collaborations, and their research and programmatic approaches are deeply impacted by the wider funding environment, which often prioritises discrete projects with measurable outputs—particularly as linked with the Sustainable Development Goals—over longer-term process-oriented forms of change. In all cases, these institutions have their own structures and timelines for deliverables, which may not always support iterative reflexive action. CUJAE, for instance, highlighted the friction between "academic time" and "community time," especially given the urgent needs of many of the communities they work with, a concern echoed by both SLURC and the ACHR. These changes also require challenging the "egos" and authorship of researchers and policymakers, a process of "unlearning" which is ethically fraught, even where there are good intentions. These represent serious time, cultural and financial challenges to reframing and extending planning knowledge, which is often outside of these institutions' control, and impacted by the wider political economy of knowledge and development. While acknowledging these structural constraints, these partners demonstrate a route towards the transformation of planning knowledge via methodologies which seek to change the perceptions and practices of key individuals and collectives in an expanded notion of planning.

4.3. Changing Collective Trajectories of Mis-Recognised Groups Through Knowledge Production: Building Trusted Relationships and Organisations

Finally, for these three partners, an important shared approach lies in building trust and solidarities over time, a practice which requires deep reflexive work on the nature of the partnership. These strategies reveal a crucial "site of impact" related to the transformation of internal dynamics and processes of self-recognition and organisation, or "conscientization" (Freire, 1968) within usually marginalised groups. These processes speak to deeper epistemic questions about who has a right and sees themselves as autonomous knowledge producers.

For SLURC, this has entailed a long process of building trust and confidence with and within the informal communities with whom they partner, and reflexive work to understand the difference between tokenistic "community participation" and a "genuine spirit of partnership and engagement" (Braima Koroma, SLURC). As articulated by Yirah O Conteh, head of the Federation of the Rural and Urban Poor, these collaborative actions (with and beyond SLURC) have boosted residents' confidence over time in their own collective capabilities, expanding and transferring this consciousness both within and across informal settlements in Freetown. For ACHR, knowledge sharing is done through storytelling, with members recounting their lived struggles and the strategies they have collectively undertaken. This sharing is intended to trigger change in both those sharing and listening to these stories, as a way of building confidence, inspiration, and collective empowerment. The complex fabric of the network over 30 years has been sustained by this "deep capacity of listening and respect" (Brenda Pérez-Castro, ACHR), moving beyond professional engagement, to encapsulate shared values and motivations such as a sense of family, solidarity, and friendship. For CUJAE, this has entailed nurturing relationships of collaboration between academics from multiple disciplines, public institutions, and grassroots groups—which may have started as linked to a particular research project—and has required the renewing of bonds of trust as their specific focus has changed over the years. These practices have contributed to important changes in the lives and collective dynamics of historically marginalised groups through their active involvement in the co-production and recognition of knowledge about their living conditions and lived experiences of inequality. These changes have been felt even without tangible outcomes in policy and planning; in the words of an ACHR member from the Philippines, "friendships have scaled, even if programs have not."

Supporting these changes in the collective articulation, negotiation of differences, confidence, and capacities of historically excluded groups is arguably the deepest layer upon which these emancipatory circuits can be tracked, and offer valuable pathways of resilience and solidarity. At the same time, these processes are fragile, and sustaining these transformative processes with and within communities can be jeopardised by participation fatigue and disempowering institutional dynamics. For SLURC, ACHR, and CUJAE, true co-production may be an "ideal" that is not always reached, resulting in different and pragmatic modalities of engagement dependent on the wider opportunity context. However, these differing expectations can be unsettling and wearying for those communities living on the frontline of risk, particularly where there may be misaligned timeframes and expectations on the roles of different actors. Overcoming long legacies of mistrust takes time; as

articulated by a community leader in Freetown in relation to the recognition of their capacities, but frustration at the lack of concrete changes, "Yes, we have the knowledge, but not the power." Nor are communities homogenous and are equally a site of contested knowledge and aspirations, requiring long-term processes of negotiation towards collective goals. In Freetown, for instance, there are differences between riverside settlements—under constant threat of eviction linked with flooding risks—and hillside settlements, that might find more political manoeuvre to advocate for upgrading initiatives. In ACHR, while important capacities have been built in the confidence and authority of particularly women leaders, this can be at great risk for these individuals when dealing with changes in government authorities, or as they negotiate social and familial expectations. Or in Havana, while a multi-dimensional understanding of equality beyond material disparities has been advanced in certain urban policies, longstanding racial and gender cultural disparities remain. Such reflections highlight the long and slow timescale of change, and the necessary—if uncertain—emancipatory work to support excluded groups to build solidarities, collectively reflect, and advocate, even where institutional or social changes do not always follow.

5. Conclusion: Emancipatory Circuits of Knowledge for an Epistemic Revision of Planning

Addressing urban inequalities requires a radical approach to the transformation of planning and governance. Emancipatory circuits, like those discussed in this article, offer alternative ways of co-producing and mobilising diverse knowledges. Whether through university-community-policy collaborations that disrupt linear understandings of knowledge, community action planning that subverts apolitical notions of participation, or forms of exchange and co-learning that unsettle universal and de-contextualised notions of expertise, these three experiences help destabilize how we think about knowledge and planning. These circuits show us living and messy examples of what it looks like in practice to heed the calls of South-Eastern, feminist, and decolonial theory—which argue that knowledge can only be transformative where it is multi-sited, cognisant of global relations, and deeply rooted in place.

In doing so, these emancipatory circuits have generated important registers of change, encouraging inclusive policy and planning outcomes; changing the planning praxis of authorities, bureaucrats, and researchers; and building collective solidarities. On their own, these may not be enough for sustained transformation. However, when layered, they represent vital pathways towards tackling inequalities in their multidimensionality—or, as hooks (1994, p. 47) reminds us in relation to Freire's work, conscientisation is not "an end itself, but always as it is joined by meaningful praxis.''

These circuits open up opportunities to address *maldistribution* through policies and practices that more closely reflect the experiences of often-excluded residents, and through concrete initiatives of upgrading, strategic planning, or urban development that address local needs and aspirations. They have supported the *reciprocal recognition* of who frames planning approaches and of the knowledge underpinning different approaches, reckoning with structural and historical drivers of oppression, and modelling methodologies to engage multiple stakeholders inclusively across diverse and intersectional identities. They have increased the *parity of participation* in decision-making, both within dominant institutions and outside them, through new or expanded platforms, collaborations, or collective organisations, with broad capacity building to support the equitable and meaningful engagement of usually excluded groups. Finally, while embracing differences and conflicts, these circuits have supported a collective sense of identity and friendship by building relationships of *solidarity and care* across diverse stakeholders and within urban poor communities, through knowledge co-production processes and concrete interventions which move towards more collective relationships with land, housing, infrastructure, and nature.

These lessons, however, come with challenges and tensions: It is no coincidence that we have referred to these circuits as "emancipatory" rather than "emancipation," reflecting the uncertain and still ongoing process of change. Contestation remains constitutive of these processes, driven by deep epistemic clashes, and the negotiation of differences toward collective goals. While capacities and reflexivity may have been built with progressive individuals, they remain embedded within hierarchical and often patriarchal institutions that may not have the will or resourcing to sustain planning changes. Nor are these issues localised, with the three partners situated inside the global development industry that remains driven by project-oriented and "results-based" forms of management. In a post-Sustainable Development Goals world, questions have been raised around the kinds of "expertise" that inform contested concepts of sustainability and resilience (Butcher, 2022). Likewise, marginalised communities are themselves full of diverse aspirations and needs, and deeply impacted by different trajectories across genders, identities, and geographies, which shape trust, social norms, and expectations.

In the face of such challenges, it might be easy to remain cynical about the routes to transformation, and the long roads of advocacy, research, and action walked by these institutions. However, the imagery of a *circuit* is used to reflect the slow but radical transformation they mobilise, as a multi-directional process of knowledge and exchange, and the halting progress through which learning and "un-learning" happens in ways that may only be visible once we arrive back to our starting points, and *know it for the first time*: "We shall not cease from exploration/And the end of all our exploring/Will be to

arrive where we started/And know the place for the first time" (Eliot, 1943, p. 39). These emancipatory circuits of knowledge invite a fundamental reframing of *what constitutes planning knowledge*, and of the spaces, actors, and practices involved. We see these as crucial questions of epistemic justice, and therefore holding deep capacities to build pathways towards urban equality.

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Conflict of Interests

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Article

Transforming Spatial Practices Through Knowledges on the Margins

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Abstract
Drawing on knowledges of spatial practitioners in Slovakia and Czechia, as well as those of feminist science and technology studies and actor-network theory, the article explores the benefits and importance of bringing diverse knowledges into spatial practice. More specifically, it focuses on the issue of including voices, perspectives, and knowledges in the construction of space other than those of status quo often implicated in the (re)production of social injustices. It proposes to look at the margins as a site of potential resistance to find spatial *practices/know-hows* and *visions* that actually contribute to the creation of spaces for good lives of marginalised communities. Leaning on the experiences of practitioners on the margins, the article presents portraits of two organisations to explore in detail what spatial practices they employ to materialise their marginalised visions. Building on an analysis of these case studies, the article closes with a description of three transformations of spatial practice that are needed for better involvement of marginalised visions in spatial production: addressing a more complete image of the world, conceiving of space as multiple becoming, and participation as a matter of care.

Keywords
actor-network theory; architecture; Central and Eastern Europe; margins; planning; science and technology studies; spatial knowledge; spatial practice; standpoint theory

Issue
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1. Introduction

Creating better environments for the good lives of diverse communities has been an ongoing goal of socially-oriented architects and planners for decades. More specifically, the issue is the inclusion in the construction of space of the voices, perspectives, and knowledges of actors other than just those in power—actors without capital or expert knowledge. The ongoing socio-spatial exclusions of many, especially socially disadvantaged communities, documented through research (for instance Musterd, 2020) and manifested through events like the London riots in 2011 (Kawalerowicz & Biggs, 2015), suggests that the question of how to include the voices of marginalised communities and create better spaces for/with them remains relevant despite 50 years of academic debates on inclusionary planning (Angotti, 2020; Blundell Jones et al., 2005; Davidoff, 1965; Healey, 1997; Innes, 2010; Lefebvre et al., 1996; Wates & Knevitt, 1987) and the accompanying myriad of realised spatial projects (Ermacora & Bullivant, 2016; Krasny & Fitz, 2019; Petrescu & Trogal, 2017). To contribute to these debates, this article presents learnings from spatial practitioners "on the margins" in Slovakia and Czechia, highlighting the transformations of established spatial know-how that would be necessary for the positive inclusion of marginalised perspectives in our shared world.

This study follows feminist scholar Sandra Harding's (2015, p. 34) call to "start research from outside dominant conceptual frameworks…[which] can enable the detection of the dominant values, interest, and assumptions that may or may not be widely prevalent, but which tend to serve primarily the most powerful groups." Planning and architecture mostly rely on/are linked to powerful groups—state, capital, societal majority—which influence the way they approach marginalised groups and create spaces with/for them. By looking "at

the margins," a term borrowed from bell hooks (1989), this study hopes to find practices that resist the reproduction of the status quo which contributes to the social injustices that they hope to alleviate.

The focus of this study is on actors on the margins of spatial practice in Slovakia and Czechia, located at the intersection of two "sites." One is the field of *visions* and *perspectives* on the margins of a planning agenda, like those of people without shelter or other socially disadvantaged communities. The other is the spatial *know-hows*/*practices* developed by practitioners outside of planning professions. Here I share the perspective with Awan et al. (2011, p. 28) that "spatial production belongs to a much wider group of actors—from artists to users, from politicians to builders—with a diverse range of skills and intents." In this article, I refer to these diverse actors actively shaping the built environment as spatial practitioners. Moreover, Czechia and Slovakia, with their relatively short history of democracy, could be considered as further margins, as the dominant Western participatory practices of including marginalised perspectives entered this region only recently and are therefore not entrenched in their spatial practices.

Leaning on the experiences of two organisations in particular, the article seeks answers to the following questions: How do spatial practitioners make marginalised visions matter? Do they create better spaces for the thriving of diverse marginalised communities than the status quo? What transformations of planning and architecture, as usual, are necessary for the positive inclusion of these knowledges—*visions*/*perspectives*, and *know-hows*/*practices*?

The article builds on Davoudi's (2015, p. 318, emphasis in original) categorisation of spatial knowledges as "knowing *what* (cognitive/theoretical knowledge), knowing *how* (skills/technical knowledge), knowing to *what end* (moral choices) and *doing* (action/practice)." Mirroring this with the double margin at/from which the spatial practitioners act—marginalised *visions*/*perspectives* and marginalised spatial *know-hows*/*practices*—the article conflates Davoudi's four categories into two that guide the text: knowing *what*—*visions*/*perspectives* that integrate cognitive/theoretical knowledge and moral choices so that an answer to *what* necessarily contains an answer to *why/what end*; and knowing *how*—spatial *practices*/*know-hows* to materialise and shape these visions. The article shows how both of these interlinked kinds of spatial knowledges—*visions and practices*—have to be expanded and transformed for the creation of good spaces for marginalised communities.

Harding's (1987) and Haraway's (1988) feminist critiques of scientific knowledge and objectivity provide a departure point for the reflection on spatial knowledges. The first part of the text draws parallels between spatial knowledges shaping the built environment and their constructivist understanding of knowledges as always partial, constructed/perceived from a certain position/body. Central to this article is the attention they bring to the importance of *practices* through which *what* we know is constructed, as well as their argument for epistemic preference of marginalised knowledges to those of the status quo. The structure of the article is inspired by the edited volume *Feminism and Methodology* compounded by Harding (1987), which brought together research in social sciences that gave voice to women—a marginalised group. She concluded the volume by stating three necessary transformations of the *practices* of social sciences in order to actually give space for these marginalised *perspectives*.

This article similarly draws on an analysis of empirical case studies that make marginalised *perspectives* matter to propose three transformations of spatial *practices*. To this end, it presents a brief overview of various styles of socially engaged planning and architecture making marginalised perspectives matter, as well as learnings from spatial practitioners in Slovakia and Czechia. The core of the empirical section is portraits of two organisations: Čierne Diery (Black Holes) and DOM.ov (*dom* = house, *domov* = home). Through the optic of actor-network theory (ANT), the descriptions try to pay attention to all kinds of components of their spatial *practices*, to find aspects involving marginalised perspectives that were perhaps until now overlooked in planning/architecture. The article closes with three transformations of spatial *practices*/*know-hows* that follow from the case studies, connecting them with concepts that provide theoretical and methodological guidance for achieving these transformations.

1.1. Socially Constructed Visions and Critical Standpoints

Through postmodern, feminist, and postcolonial critiques of planning, an understanding of knowledge as socially constructed has found its way also to planning and architecture (Davoudi, 2015; Rydin, 2007; Sandercock, 1998). In this paradigm, truth is not simply out there to be discovered by scientific methods, technology, and reason. It is constantly constructed through multiple technologies and influenced by power structures. In this article, I borrow Haraway's (1988) metaphor of knowledge as embodied *vision*. I find it particularly fruitful for planning and architecture, whose primary task is to envision futures. The double meaning of *vision* as the power to see with our eyes and to anticipate futures speaks of worlds envisioned from the perspective of a particular body. In spatial practice, it is mostly that of a planner or architect. Visions, like knowledges, are thus always subjective, partial perspectives of the world now and in the future. They are influenced by technologies such as "ways of life, social orders, practices of visualisation," writes Haraway (1988, p. 587). Consequently, the spatial knowledge/vision of planners or architects of *what* is suitable housing for certain people or *what* is the right way to treat a ruin are matters of personal and societal views as well as education and discipline's

canon, whose correctness is justified by the status quo of the discipline.

The constructivism of knowledge, like the multitude of technologies influencing it, is unavoidable. What can be avoided is the promotion of a single vision as the truth under the cloak of objectivism. This, in Haraway's (1988, p. 584) words, is to play the "god tricks" that "make it impossible to see well." Feminist critiques show how the dominant vision is, and throughout modern history has been, that of the white Western bourgeois man. He—the Vitruvian man or Modulor—stands rather prominently also in the centre of architectural theory and practice. The inadequacy of god's view and his blindness to social realities were disclosed especially by the failure of modernist spaces planned mostly according to Modulor's body and vision, promoted largely by Le Corbusier's (1954/2004) work. The critique took place in the streets and in academia and led to the inclusion of different voices—especially those of locals—into planning and architecture. This gave rise to diverse forms of socially-oriented spatial practices, thematised briefly below, aimed at creating spaces for various visions in spatial production and consequently the world. Though there is much to be criticised about participatory processes, countless examples do show that the inclusion of other visions than those of planners does often contribute to better spaces than those envisioned solely from the view of the planning disciplines.

Furthermore, Haraway (1988), Harding (1987), and other feminists argue for the preference of marginalised visions on epistemic grounds, claiming that they can provide a less distorted image of the world than the status quo. In Haraway's (1988, p. 584) words, it is "because in principle they are least likely to allow denial of the critical and interpretive core of all knowledge….The subjugated have a decent chance to be on to the god trick and all its dazzling—and, therefore, blinding—illuminations." Importantly, their epistemic advantage is not a question of identity per se but of a standpoint from which they are able to "see" and critically reflect knowledges. Such a critical standpoint is, in Harding's words, shaped "through the struggles they wage against their oppressors" (Harding, 1987, p. 185). Proven by critical reflection, their knowledges are based on, measured against, and contribute towards a more complete/less false image of social reality than the status quo playing the "god trick." Since it is not about identity but struggle, anyone can learn to see from the position of the marginalised or, more generally, develop a less false vision. Building on this premise, the article investigates *how* and *to what extent* the spatial practitioners described here succeed in doing so and if this leads to the construction of better spaces for marginalised communities.

1.2. Adding Visions, Transforming Practice

One way to include marginalised visions is to simply "add" them. I borrow the term from Harding (1987), who outlined three ways through which it was attempted to add the views of women into social sciences, though these mostly did not lead to the actual inclusion of their views. Parallels can be found in architecture and planning: (a) Bringing architects or planners from marginalised groups into existing power structures often gives the persons little manoeuvring space for actual changes and bringing forth their views. Furthermore, having been educated in professional institutions, their disciplinary knowledge is often closer to the status quo than to marginalised perspectives. (b) Focusing on the experiences of marginalised groups without changing one's visioning apparatus will only disclose views useful for the sustainment of the status quo rather than for the benefits of the marginalised. (c) Treating marginalised groups as victims strengthens stereotypes of inadequacy and denies their visions any agency independent from the system that has excluded them in the first place, which is therefore perpetuated.

These additive approaches are not to be dismissed completely. Often, they did contribute towards challenging the core knowledges of planning or architecture and the subsequent creation of better spaces according to previously marginalised perspectives. Gender mainstreaming is perhaps the best-known case. However, as Haraway (1988) and Harding (1987) show in their respective feminist critiques, more fundamental transformations of the scientific (and planning) *practice* are needed for actually making marginalised visions matter. "*For the master's tools will never dismantle the master's house*. They may allow us temporarily to beat him at his own game, but they will never enable us to bring about genuine change," to borrow from Audre Lorde (2003, p. 27, emphasis in original). Scientific and design practices/know-hows were developed by those whose visions they are to promote or, in the case of planning, materialise to further sustain their position of power. When aiming at actually including marginalised *visions*/*perspectives* in spatial production or elsewhere, it is therefore important to pay attention not only to *what* needs to be included but also *how*.

Marginalised visions in planning and architecture are included through a wide range of participatory practices and socially-oriented styles of planning. Most of these have their origin in the above-mentioned critique and fall of modernist planning and architecture. Advocacy planning (Davidoff, 1965), transactive planning (Friedmann, 1973), community architecture (Wates & Knevitt, 1987), collaborative planning (Healey, 1997; Innes, 2010), and different kinds of transformative planning (Angotti, 2020) all place the perspectives of various stakeholders, among them marginalised groups, in the centre of spatial production, while often critiquing the status quo of neoliberal planning. These practitioners have created or appropriated a multitude of tools like design workshops, questionnaires, round tables, or spatial interventions, to create spaces for perspectives outside of the planning disciplines. These are new

know-hows compared to the models, sketches, and drawings coded in expert language typically used in planning and architecture to make space matter. These new tools are furthermore accompanied by transformations in the skills and role/standpoint of practitioners. This reflected their changing relationship with their new clients—marginalised communities. Deliberative planner (Forester, 1999), crossbench practitioner (Miessen, 2010), or Till's (2013) dependent and contingent architect are just a few role models that hint at the importance of positionality and standpoint from which the tools and *know-hows* are employed to actually make marginalised perspectives matter.

These practices often do create better spaces for the communities in question, but as outlined at the beginning of this article, they have not solved the issue of including marginalised perspectives once and for all. By negotiating between diverse experts and lay knowledges, they face a multitude of issues of whose knowledge counts and *how*. The following aims to contribute to these dilemmas with learnings from Slovakia and Czechia by investigating what kinds of *know-hows* spatial practitioners employ to gain/construct and consequently materialise marginalised *visions*, from what standpoints they practice, and if this leads to the creation of better spaces for the marginalised communities than those of the status quo.

2. Spatial Practices in Slovakia and Czechia

Both countries are part of Central and Eastern Europe—a region often described through the post-socialist prism, but otherwise largely missing from planning discourse, especially the one outlined above. Due to its short history of participatory planning and architecture, investigating it could be fruitful to identify practices that include marginalised perspectives in different ways than those in the West. Looking at the spatial practices in their own right and not through the usual lens of transition towards Western democracy, which underlines the practices above, could furthermore yield findings beyond an "additive" approach that strengthens the vision of the West.

2.1. Seeing the Field

The authors of the fieldwork on which this paper draws—myself and my colleague Lýdia Grešáková—are spatial practitioners active in Slovakia and Czechia, which defined the choice of the research field. Our position is influenced by our work in the collective Spolka, whose agenda is to engage diverse marginalised visions in the co-creation of cities. This influenced our view of this field, as our interest was to learn from these spatial practices as well as to find allies in expanding the visions that shape the built environment beyond those of the status quo. At the same time, my own vision is heavily influenced by Western theories and practices since I was educated exclusively in Western Europe. In this article, I hope to see from the outside in and from the inside out; understanding both, to paraphrase hooks (1989), while acknowledging the power imbalance, as most of my theoretical knowledges utilised to analyse and explain the field stem from the West.

The objective of the study was to identify formal and informal organisations that create spaces for visions that are on the margins of mainstream spatial production. The organisations of most significance were those which develop their own (often changing) agenda and do not make it solely dependent on external factors, like saving a particular building or protesting against a certain development. The latter organisations often cease to exist with the (often literal) disappearance of the external factor. Those with their own agenda continue their struggle, through which they strengthen the critical standpoints from where they ongoingly construct various spatial knowledges to better articulate and materialise their visions. The organisations we identified can be labelled insurgent and/or advocacy planners, often combining both. The former are those who are themselves marginalised and aim to materialise their own visions (Miraftab, 2009), and the latter work on behalf of marginalised communities (Davidoff, 1965). In this article, I focus on two organisations practising mostly advocacy planning. Their positionality is similar to that of most planners and architects, as they do not belong to the marginalised communities they plan with/for, and their learnings could therefore be easier to translate.

The aim was to explore and identify diverse components/know-hows of organisations' spatial practices that contribute to making marginalised visions matter. Therefore, we expanded the traditional understanding of space as a container and spatial practice as only consisting of know-hows from architectural and planning canons. We shifted our attention from buildings to all kinds of spaces and treated all activities of organisations as interconnected aspects of their spatial practice. To do so, we borrowed the optic from ANT that is gradually finding its way from science and technology studies to the architectural analysis of space (Hansmann, 2021; Latour & Yaneva, 2008; Yaneva, 2009). ANT invites us to see space as a dynamic process constituted by all kinds of actors—humans, non-humans, materials, as well as concepts—and especially by relations and networks between them. Consequently, we could perceive buildings, workshops, books, loans, people, written and told stories, as well as different visions, knowledges, skills, and their interdependencies, as aspects of space and its construction. ANT here was not used as a strict methodology, but rather, drawing on Haraway (1988), as a technology to expand our visioning apparatus beyond what is typically considered spatial practice in architecture and planning.

2.2. Uncovering the Iceberg

Through snowball sampling via email extended by desk research, we identified nearly 200 organisations that

according to us and our informants—activists, architects, social workers, artists, and engaged citizens active in Slovakia and Czechia—materialise otherwise marginalised *visions* and *perspectives* through their spatial *practices*. We investigated 20 in more detail through interviews with a member from each organisation and analysis of their work available online. The latter provided some views of the marginalised communities—the "clients" of these organisations—whose perspectives are here otherwise largely underrepresented. The selection aimed to capture a wide range of practices along three axes: different marginalised visions described below, a range of spatial practices/know-hows from temporary interventions to education and lobbying, and location in cities and on peripheries.

The field of marginalised perspectives covers a wide spectrum. The largest section consists of visions of local, mostly middle-class people concerned about their immediate environment: public spaces, bicycle and foot mobility, specific buildings often marked by socialist stigma, parks, forests, fruit trees, or biodiversity. In a context with few opportunities for participation, even these views can be considered marginalised, as they are not included in the planning. These actors mostly represent their own perspectives on the issues but sometimes also those of children or non-human critters. Some but not all practices are underlined with post-capitalist or degrowth visions. Frequent also are advocacy planners who materialise perspectives of shelterless people, many from marginalised Roma communities. The visions overlap and intersect in the activities of each organisation, as illustrated in the two cases below. Furthermore, even within this small field, what is marginalised in one context does not have to be in another. For instance, industrial buildings, according to Lipták from Čierne Diery, have long been on the agenda of Czech protection institutions, while in Slovakia they still decay.

Each organisation employs and seamlessly combines diverse spatial know-hows across various scales, sometimes also shaping national regulations to ensure systematic change. They shape physical spaces through short- and long-term spatial interventions, performances and festivals, technical drawings, or zoning plans, as well as constructing virtual spaces through social media, websites, printed media, talks, conferences, or exhibitions. Such a range of practices and their combination is possible due to the inter- and transdisciplinarity of nearly all organisations. Their members collectively bring a wide spectrum of disciplinary perspectives and know-hows from arts, social work, geography, journalism, sociology, architecture, design, and planning, though mostly they could be best described as engaged citizens. Their disciplinary backgrounds become visible only upon closer inspection. Then it also becomes apparent that there are architects in many organisations, especially those with particularly interesting spatial practices. However, unless it is an architectural collective—which is not the subject of this article—those with expert/disciplinary spatial knowledges are not in a leading role, giving generous space to other knowledges.

The study uncovered only a small portion of a larger iceberg of invisible visions, to use the analogy of Gibson-Graham et al. (2013). In other words, the number of organisations/people is not sufficient to materialise all missing perspectives. The representatives of the DEDO foundation, for instance, voiced their wish and identified the need to focus on affordable housing, but their agenda to end homelessness is not yet sufficiently supported by the planning system. The environmental movement Limity Jsme My recently shifted its focus, after the Czech government committed to stopping coal mining, which was the main agenda around which the movement assembled. Now they enable, promote, and envision post-coal economies in the mining regions. The shifting focuses of the organisations gradually uncover parts of the iceberg, while at the same time hinting at the many visions that still remain hidden and insufficiently materialised, i.e., are on the margins of planning and architecture.

The two organisations described in detail below develop the most interesting spatial practices for illustrating the above and exploring the entanglements between marginalised *visions*/*perspectives* common in the field and spatial *practices*/*know-hows* to materialise them. However, these practices should not be taken as *the* representatives of materialising particular marginalised perspectives. The visions of the Romas living in a housing estate in a city on the Czech-German border are different to those living in illegalised sheds on the peripheries of small villages in Eastern Slovakia and so are the spatial practices to materialise them. Following Haraway's call to avoid the risk of essentialising any standpoints, the text invites the reader to pay attention to the situated relationalities of each practice.

2.3. Čierne Diery

What started as a group of friends interested in abandoned buildings in Slovakia grew into a known name with nearly 50,000 followers on social media. This informal collective of individuals with expertise in journalism, industrial history, architecture, urbanism, and design has in their five years accomplished, among others things, the following: published and sold out two books about abandoned historical industrial buildings, most of them located in Gemer and other poverty struck regions in Slovakia; commissioned, exhibited, sold out, and also auctioned some of the over 210 prints of these buildings created by local young artists; collected thousands of euros for reconstructions of abandoned buildings and diverse social projects like supporting teachers in these regions; funded and organised the placement of a forgotten modernist sculpture into public space; created documentation of buildings for The Monuments Board of the Slovak Republic; funded research on modernist buildings at the Slovak Academy of Sciences; collaborated on

architectural competitions and reconstructions; and, in cooperation with local architects, designed and built a forest sauna and a tourist accommodation in an old mansion. Their know-hows are mostly of artistic and journalistic nature combined with community building on a large scale.

2.3.1. Vision of the World

Building a relationship of people with abandoned buildings and their diverse historical layers of architectural as well as intangible cultural heritage is what Martin Lipták from Čierne Diery describes in our interview as their aim. It could also be termed as bringing forgotten buildings, stories, and regions into the public and making them matter by sparking the same interest they have for them in others. "We try to change the optics of how society sees these buildings because if people don't value them, any protection is useless," says Lipták. Through their interest in saving abandoned buildings, they uncover the complexity of the social reality in which these buildings are embedded, which in turn influences their spatial practice. They focus on previously wealthy post-mining regions, with lots of interesting built heritage from times when this region belonged to Austria-Hungary, which poverty "protected" from development. When the land was exhausted, the production stopped, and people moved elsewhere. Left behind were few people, most of them Romas, deteriorating infrastructure, environmentally damaged land, no jobs, and buildings of the Hungarian past with lower architectural value than their modernist cousins, which already occupied the small number of historians in Slovakia. Lipták reports that many would rather keep their properties unused than have Romas moving in. The issue is thus not only deteriorating architectural heritage. It is also the economic unattractiveness of the region, racism against Romas, difficult relations of Slovaks with anything Hungarian, brain drain, and an understaffed Slovak protection office. Importantly, it is all those things together, and making these buildings matter requires engagement with all these entangled aspects of reality through the wide range of practices outlined above, as none of them would be sufficient alone.

2.3.2. Spatial Practices/Know-Hows

Their activities, like their perspective, developed gradually, as they saw what resonates with the public, says Lipták, and so they gradually learnt through practice *how* to materialise their vision. Their approach to simultaneously address the above-mentioned entangled fields can be partly illustrated by their most recent architectural project—a tourist accommodation built with the money from prints and book sales in a deteriorated mansion in the town of Jelšava. The project is embedded in the ecology of their other activities, like prints, books, stories on social media, and guided tours which already bring tourists and their capital to this region, that, however, lacks the necessary infrastructure. In the role of both investor and client, Čierne Diery collaborated with the Slovak architectural office named 2021 to create a partial renovation by carefully inserting a timber structure into the most damaged wing of the mansion. The intervention adds new materiality and function while keeping the histories present and alive, weaving together contemporary minimalism with original facades and marks left by socialism. "It is a metaphor," says Lipták, "that one can work with the building also otherwise." Waiting for funds for a complete reconstruction is, in this region, futile and Čierne Diery shows that other ways are possible. In the construction, they also involved local companies and individuals, especially Romas, giving work to the locals most in need. Also, the modus operandi of the accommodation should contribute to strengthening the local economy. At the time of writing this text, the accommodation is finished, but not yet running. Lipták signals that its operation will be similar to that of their earlier project—a sauna in Spišský Hrhov, built in 2018 with the help of a local municipal company employing mostly Romas. After its completion, they donated it to the village, which has operated it since then on a donation basis and it is booked out for months in advance.

2.3.3. Qualities of Created Spaces

Their work receives many positive comments on social networks. People thank them for their work, voice their own stories connected to the forgotten places, and locals treasure the tourists now present in their area, as well as the new perspectives they gain on their surroundings. The forest sauna won the public vote for the Slovak architecture award CE-ZA-AR in 2020 and Lipták mentions that many people contacted them to build one also in their village. Tourists visit the region and some buy and develop properties there. Čierne Diery's vision/optic of these places seems to resonate with many and shifts from the margins towards the centre. While materialising their vision, they also pay attention to actually improving the lives of the locals. They invest all profits generated through their activities back into the regions, building diverse infrastructures for and with local communities. Lipták is also aware of the dangers of tourism and Čierne Diery therefore carefully chooses what to talk about and how. According to him and their social media, their future activities should focus on social and educational projects in the region, like creating affordable housing for disadvantaged people and thus constructing additional spaces for the good life of local communities.

2.4. DOM.ov

This organisation assists people from marginalised Roma communities with housing needs. Their main product is a year-long programme centred around constructing single-family houses built into private ownership by their

future owners with the help of the NGO and the community. They are active in Eastern Slovakia in different villages, where many Romas settled during socialism and where others moved after their eviction from the regional capital since the 1990s. The current spatial practice of DOM.ov was developed over 17 years and builds on three previous projects with the same aim, one doctoral dissertation (Sládek, 2016), one habilitation thesis (Smatanová, 2020), and several student projects. What started as an experimental solution to house a single Roma family being evicted from their illegalised home grew into an NGO uniting two NGOs and a bank. They employ several social workers and collaborate on a regular basis with architects, planners, lawyers, and bankers. The spatial practitioners are mostly from the white educated majority, but some of them have been active in the field for many years and some belong to the marginalised community in question, which contributes to an inside-outside positionality of the organisation.

2.4.1. Vision of the World

For DOM.ov, the vision of good life for marginalised Roma communities is grounded in good housing, to which people from these communities have limited access. Their poor housing situation has historical roots interlinked with ongoing racism. In 1958, nomadism was illegalised and nomads, most of them Romas, were given land on which they should settle. With the end of socialism, however, this land was given back to its owners, the houses became illegal, and many had to move out with no real options provided by a state undergoing rapid privatisation. Many built make-shift shacks on the peripheries of villages and towns. Others were housed in rental state housing in estates on peripheries, often leading to spatial marginalisation intersecting with segregation from necessary social infrastructures (Sládek, 2016; Smatanová, 2020). These rental buildings were unkept for decades and are today gradually being demolished due to supposedly bad structural conditions, with little or no alternative housing provided. The bad state of the housing is used to perpetuate a narrative of Romas as dirty, messy, misbehaved, and, thus, undeserving, which complicates the provision of new housing by municipalities based on the votes of white people. The now shelterless people often join their families in make-shift settlements or abroad, as their access to other housing options is limited due to a shortage of social housing, their low/no income, inherited debts, and racism. Romas in these marginalised communities are affected by multiple interdependent negative factors like racism, generational poverty, social exclusion, insecure housing, bad access to health provision, low literacy, and difficulties to enter the job market (Radičová, 2001), which perpetuates their lack of access to decent housing and good life. Building houses is for DOM.ov a tool for addressing the housing problem and with it at least partly other issues. In a TV report, their clients (a term used by DOM.ov) describe their motivations to build their house with a vision of better life, especially for their children (Rozhlas a televízia Slovenska & Jakhetane-Spolu, 2021). It would bring them stability, knowing they will not be thrown out and can arrange the home as they want.

2.4.2. Spatial Practices/Know-Hows

DOM.ov provides a framework/space for enabling their clients to achieve a vision of better life materialised in their own house. Interested people must enter and actively participate in a yearlong programme organised in cohorts. These result in the construction of a whole street with five to 15 houses, creating a new neighbourhood as an integral part of a growing ecosystem of existing villages. DOM.ov communicates with the village to secure public land for the houses that the families then buy or get to rent long-term. They also organise the drawing up of new zoning plans in collaboration with planners. For clients, they organise educational workshops about planning and construction as well as home finances. Throughout the year, all clients must save €50 per month. Those who succeed are assisted by DOM.ov in getting microloans with a payback of 13 to 15 years from the partnered bank. Clients can then choose from six catalogue houses with a 30 to 110 m^2 habitable, sometimes expandable, area designed by the organisation. Saving and staying motivated is difficult for many, and not everyone completes the programme and builds their house. Social workers support the families throughout this process, help them with finances, encourage them to overcome difficulties and support them also after the completion of the house. All these practices/know-hows are intertwined and necessary for the materialisation of the vision.

2.4.3. Qualities of Created Spaces

According to Ondrášiková from DOM.ov, whom we interviewed, nearly 70% of the new homeowners are employed and their children go to school even beyond primary education. “If you have your own house, your thinking changes, one feels better than when knowing that you constantly have to repair things,” says one of the clients (Rozhlas a televízia Slovenska & Jakhetane-Spolu, 2021, 24:00). “Wherever there will be such opportunity, everyone should use it, build a house,” says another (Rozhlas a televízia Slovenska & Jakhetane-Spolu, 2021, 23:39). The positive results seem to create a snowball as they motivate more people from marginalised Roma communities to join the project as well as villages to choose this programme over construction of usual rental housing. In March 2022, DOM.ov announced on their social media that 54 families had entered the new cohort in a village where, in November 2021, the construction of eight houses had started. All this suggests that DOM.ov does materialise their visions well, although what this good life consists of and the path to it can be critically

questioned. It mirrors that of the status quo middle-class dream: saving through hard work and discipline, getting a loan, choosing a house from a catalogue, and building it for your family. It is, however, audacious, as probably only a few would envision this for anyone from marginalised Roma communities. The standardisation of their mass product could also be criticised. Yet, it supports their efforts as their clients and villages can better see what to expect, which makes them more inclined to adopt the materialisation of the vision DOM.ov offers. Furthermore, standardisation allows rapid replication, which has enabled DOM.ov to build already in over 30 villages.

3. Learnings and Transformations of Spatial Practices/Know-Hows

Drawing on the two case studies, at least three aspects, that are rarely found in planning and architecture as usual, emerge that seem to be essential to *how* these practices make marginalised *visions*/*perspectives* matter. The text below outlines these learnings and connects them with concepts that can provide theoretical and methodological guidance on how to transform spatial *practices* for the positive inclusion of marginalised *perspectives* in order to create good spaces for marginalised communities. The aspects are interdependent and in no order of importance. They focus on positionality/standpoints and know-hows of spatial practitioners while acknowledging that larger changes in the systems in which spatial practices operate are necessary. The focus on the individuals rather than the system reflects the above practices, which transform, first of all, their practice and through that drive forth also systemic change.

3.1. Addressing a More Complete Image of the World

Both practices engage with the entanglements of social realities and intersectional issues as they strive to build good spaces for marginalised communities. Through diverse know-hows, multiple material engagements, and interventions, they gradually gain a more complete image of the world and uncover yet invisible parts of the "iceberg." DOM.ov sees the housing issue and its solutions as entangled with racism, generational poverty, and ownership, while Čierne Diery sees the reality of abandoned buildings together with that of the perceptions of people, local economies, and infrastructures—they both see more than just buildings. Situated in their constantly developing understanding of the world are their visions of *what* good spaces are and *how* to construct them. Judging on the positive receptions, their spaces constructed with a more complete image of the social world are better addressing reality's complexities than the solutions conceived from the "god's view" by the status quo—unkept rental housing for marginalised Roma communities or inactivity in poor regions.

Transdisciplinarity—a common feature of nearly all investigated organisations—appears to be one important ingredient of such practice. Individuals from different disciplines that are an integral part of the organisations, or their collaborators, enable the teams to perceive a given situation and consequently define the problem from multiple angles. Transdisciplinarity does not require that the practitioners give up on their knowledges—*know-hows* and *visions*—but that they question and transform it. This seems to contribute to the development of a critical standpoint, from which they can construct less false social realities. The knowledges of the locals also enter the process and challenge disciplinary knowledges, as well as being transformed by them—whether concerning construction methods or identity. Furthermore, various disciplines bring their own tools and methods to address the problem, which gives rise to transdisciplinary spatial practices seamlessly blending architecture, journalism, artistic practice, or education, which in turn enables the creation of the diverse spatial components discussed below. Architecture and planning are transdisciplinary practices in their nature, as Doucet and Janssens (2011) show in their edited volume on the topic. The practices above underline this and encourage the expansion of knowledges included in spatial production.

3.2. Space as Multiple Becoming

The various aspects of space employed by the practitioners—from brick and mortar, zoning laws, and microloans, to diverse people, graphics, histories, and narratives—as well as the *know-hows* used to shape it, can only be integrated and brought together in a concept of space that allows for their perception. Keeping the still common perception of space as a container obstructs seeing and working with its other aspects, which, as shown above, are all important for supporting the good life of the communities. Building a house is not sufficient. It is just one of many infrastructures, to borrow from Easterling (2016). New sources of local income or loans as economic infrastructures or narratives, education and cultural capital as social infrastructures are equally crucial for supporting a good life. Conceiving space as a construction of multiple expanding infrastructures is not something the practitioners explicitly mention, but it is one way to describe the spaces they create.

Furthermore, the spaces these organisations create are never finished but are constantly "in flight"—an ANT perception of buildings by Latour and Yaneva (2008). Such a vision of space allows the perception of the process of making, as well as "life" after the construction of individual components. The practitioners of DOM.ov continue to support the families after the houses are erected, and the built houses with their satisfied inhabitants play a role in encouraging others to join the project, while Čierne Diery ongoingly shapes the region through various interventions. The spaces for the good

life of these communities are thus in constant becoming. Conceiving of space as an ongoing process creates necessary opportunities for new *visions*/*perspectives* and *know-hows* to continually enter and change the spaces and practices.

3.3. Participation as a Matter of Care

The visions of the marginalised communities and other disciplines are not "added" to spatial production through formal participatory tools like questionnaires, round tables, or co-design workshops since many from these communities would lack the necessary resources to join in on. Instead, spatial practitioners engage with them through diverse activities that are an integral part of the practice. Social work, guided tours, or talks with mayors are all ways of getting to know the visions of the various actors. The kind of activities does not seem to matter as much as the desire of the practitioners to actually see from these diverse positions while transforming their own. In other words, their activities are a means of developing critical standpoints that allow the organisations to see simultaneously from the inside and the outside, understanding both and thus gaining a less distorted image of the world. While the practitioners do not provide many clues on how to develop such critical standpoints if you are not already inclined to help others, the work of Maria Puig de la Bellacasa could offer some guidance.

De la Bellacasa (2017) builds on science and technology studies and the ANT debates sketched above to introduce the notion of "matters of care." She draws on Fisher and Tronto's (1990, p. 40) definition of care as "a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible" and invites us to think with care in each situation. Such thinking is intended as a situated method of inquiry, rather than a normative stance generating ready-made solutions:

> Fostering care should not become the equivalent of an accusatory moral stance—if only *they* would care!—nor can caring knowledge politics become a moralism disguised in epistemological accuracy: Show that you care and your knowledge will be "truer"….I suggest rather that it can be about a speculative commitment to think about how things could be different if they generated care. (de la Bellacasa, 2017, p. 60)

The spatial practitioners described here provide some concrete situated answers to de la Bellacasa's call. By asking oneself the easy, yet complex question "how to care?" in each situation, all spatial practitioners could gradually develop "critical standpoints that are *careful*" (de la Bellacasa, 2017, p. 60) from where they could see better, and consequently construct better, more caring spaces for diverse communities.

4. Conclusion

The article discussed in detail spatial practices/know-hows of two organisations that materialise diverse marginalised visions—merging theirs with those of local communities. Čierne Diery strengthens local economies in abandoned regions and DOM.ov provides stable homes for marginalised Roma families. The positive reception of these spaces by the communities demonstrates that they do materialise their visions well, even if more voices from these communities, as well as the test of time, are needed to provide better evidence. Although these practices are situated in specific socio-material realities, my analysis of their approaches points to aspects that are transferable to other contexts. These cannot simply be added to spatial practices as usual but require their transformation: enlarging the palette of spatial components beyond those conceiving of space as a container and combining know-hows from multiple disciplines in transdisciplinary practices to employ diverse aspects of space simultaneously; employing multiple disciplinary optics to perceive and consequently better address complex social realities; striving for the development of critical careful standpoints through critical reflection on knowledges—*visions* and *know-hows*—by asking oneself how each situation could generate care. These aspects can be integral to any spatial practice to better involve marginalised perspectives and reduce rather than reproduce the injustices caused by the status quo. The task of creating good spaces for diverse marginalised communities thus does not have to rest on the shoulders of a few engaged actors but can be on the agenda of all spatial practitioners. That said, there are multiple structural obstacles which are not discussed here, like the reliance on capital, that could be the subject of further study. Meanwhile, the practices above point to creative solutions to overcome these obstacles in their specific contexts, for instance by generating their own capital.

The above shows that spatial/geopolitical, social, and disciplinary margins are valuable fields of investigation to find spatial *know-hows* and *visions* that contribute to better spaces than those built by the status quo. Spatial margins in particular appear to be a good location for such practices. Both case studies are located on the spatial margins of Slovakia, in poor peripheral regions. State or capital have little/no interest here, which possibly leaves more material and political space for other visions—a dynamic known by urban pioneers. The *visions* and *know-hows* developed on the geopolitical margins of Western Europe in Slovakia and Czechia are perhaps not so radically different to those on the margins in the West. Yet, as the article aimed to show, they can advance debates in planning and architecture as well as provide inspiration for practices in the West, especially for situations where marginalised communities are not able to participate in collaborative dialogues due to a lack of resources.

Learnings in this article hope to also contribute to shaping the Central and Eastern Europe context. Nearly all interviewed practitioners mentioned the need for good case studies as the most important thing that would help them to promote their visions. It is, therefore, crucial to bring these learnings there. This academic article will most probably not reach the field. Hence, other formats of dissemination like workshops, an exhibition, or a publication targeting the local audience would be more appropriate and are currently in planning. They should contribute to the efforts of DOM.ov, Čierne Diery, and other organisations in shifting knowledges in the region and influencing the technologies and optics through which planners and architects think, design, and build spaces.

This article aimed to explore and demonstrate the benefits and importance of bringing knowledges into spatial practices that are typically outside of planning disciplines. This was reflected also in the theoretical framework of the article. It was only by changing the visual apparatus of seeing space through ANT that the complexity of these spatial practices could be explored. Thinking through knowledge perspective with the help of feminist science and technology studies facilitated reflection about how other visions can enter and influence spatial production. The article hoped to show how these could be useful tools for reflection in the construction of spaces for the good lives of marginalised communities. Exploring these thinking technologies further could yield findings of other crucial transformations of spatial knowledges for enabling the creation of better spaces for the good lives of diverse communities.

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Article

Copenhagen's Struggle to Become the World's First Carbon Neutral Capital: How Corporatist Power Beats Sustainability

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Abstract
Nordic cities are often perceived as frontrunners of urban sustainability and their planners increasingly embrace and combine environmentalist ideas with communicative planning approaches. We argue that how corporatist networks promote green growth strategies that can undermine sustainability targets is often overlooked. In this article, we examine how the City of Copenhagen is failing in its efforts to become the world's first carbon-neutral capital by 2025 partly because of corporatist capture of the decarbonisation agenda. Taking a phronetic social science approach we shed light on the production of knowledge and counter-knowledge in planning conflicts over energy infrastructure, in particular the iconic €530 million Copenhill waste-to-energy plant in Denmark. On one side of the conflict was a green coalition that initially blocked the proposed energy megaplant to defend the city's ambitious climate targets. On the other side was a corporatist coalition who subsequently succeeded in strong-arming the city council to accept the plant, even though that meant carbon emissions would increase significantly, instead of decreasing. We focus on this U-turn in the planning process as a case of dark planning and a knowledge co-creation fiasco. Our findings reveal how the sustainability concept can be utilised as an empty vessel to promote private sector export agendas. We suggest that environmentalist ideals may stand stronger in planning conflicts if they link up with a broader alternative socio-economic agenda capable of attracting coalition partners. The lesson to be learned for green coalitions is that it is crucial to combine expert, local, and political knowledge to be able to "read" the power configuration and develop strategic and tactical capacity to challenge dominant discourses.

Keywords
carbon emissions; climate change; collaborative planning; Copenhagen; corporatism; iconicity; sustainability transitions; urban energy

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1. Introduction

Cities around the world increasingly see themselves as key actors on the global climate emergency, and Nordic cities are often perceived as frontrunners of urban sustainability (Arcadis, 2018; Johnson, 2020; Simpson, 2018). This is linked to a tradition of co-creation, collaborative, and experimental approaches to planning and strong democratic governance (Eneqvist & Karvonen, 2021; Norström et al., 2020; Nyseth et al., 2019). At a time when national governments are seen to be doing too little too late, cities spearhead significant reductions in carbon emissions and innovative climate solutions (Droege, 2011; Hansen, 2021; REN21, 2021). Transnational city networks like C40 promote best practices of urban decarbonisation and claim that green cities by their examples are inspiring national leaders in politics and business to act (Baeten, 2018; Busch et al., 2018). Accordingly, planners and planning schools are embracing environmentalist ideas, understood as the

nature conservation and climate mitigation part of the urban sustainability concept (Beatley & Wheeler, 2014; Campbell, 2016; Sager, 2015). Climate action plans and investments in energy plants are important tools in urban energy transitions. Brookes and Locatelli (2015, p. 57) note that energy plant megaprojects "are often seen as too late, too costly, and fail to provide for society the promised benefits." The combination of the essential nature of energy plants and their poor delivery track record suggests a need for a better understanding of how and by whom knowledge is created and negotiated in energy planning.

Neoliberal ideas have shaped physical and socio-economic transformations of cities in advanced capitalist countries for decades (Fainstein, 2001; Harvey, 1989; Tarazona Vento, 2017). Broadly defined, neoliberalist doctrine advocates a private-sector solution to the city's economic, environmental, and social problems (Sager, 2015). There is an ongoing debate in urban studies and planning on whether the neoliberal influence is nearly total or only partial. Some authors stress the hegemony of neoliberalism and its success in absorbing elements of alternative approaches (Béal, 2012; Clark, 2014). Other authors see a diverse picture of planning outcomes where neoliberal ideas are also challenged and defeated, sometimes by communicative planning ideals with an emphasis on participation and collaboration (Baeten, 2018; Sager, 2015). Our case study deals with conflicts in a planning process of urban energy infrastructure in a political context that is neither clear-cut neoliberal nor exclusively embedded in a Nordic welfare state setup with strong democratic governance. Defining features of the specific institutional context are, on the one hand, the dominance of public non-profit energy companies, municipal control over important aspects of energy planning, and strong state regulation of heat supply, which is far from neoliberal orthodoxy. Also, co-creation of knowledge between stakeholders is a key feature of the official decarbonisation strategy. On the other hand, the case suggests a failure in implementing communicative planning ideals, and murky, dark planning practices prevailing over transparent democratic decision-making.

By focusing on deficiencies in Copenhagen's decarbonising efforts and failures in attempts to co-create knowledge this article shows how "green" growth strategies can undermine urban environmentalist policies. Our case study deals with an energy planning paradox which is that the City of Copenhagen, which at the same time as it set very ambitious climate targets—to become carbon neutral by 2025—also started building a waste-to-energy megaplant that multiplied emissions and undermined the strategic decarbonisation agenda. The research question is: *How could a corporatist coalition undermine Copenhagen's plan to become carbon neutral by 2025?*

This article is based on a singular empirical case study of the planning of the Copenhill waste-to-energy plant. It shows how validity claims backed by a national corporatist coalition trumped the municipal planning department's communicative and environmentalist approach and their validity claims based on local knowledge. The article concludes that corporatist power can capture sustainability strategies and that new approaches to sustainability coalition-building are needed. The article first provides a description of actors and the planning context, then moves on to describe the theoretical and methodological approach in this phronetic case study. Then, it follows a detailed analysis of four tension points in the planning process. Lastly, the conclusion sums up what can be learned from the case.

2. Actors and Planning Context: Waste-to-Energy and Decarbonisation Strategy

We use the term "corporatist coalition" to describe the network of powerful actors who successfully pushed for a U-turn in Copenhagen City Council's (CCC) decision-making on approving the Copenhill project in 2012, after initially rejecting it in 2011. Corporatism (or neo-corporatism) is often used to refer to policy regimes where strategic decision-making is dominated by tripartite power networks consisting of the state and the main interest organisations of capital and labour (Jessop, 2002). Corporatism manifests itself in both formal and informal power networks and may undermine collaborative planning and decision-making processes based on democratic dialogue. The key actors in the ad-hoc corporatist coalition set up in support of the waste-to-energy megaproject were the management of energy company Amager Resource Centre (ARC, previously operating under the name I/S Amagerforbrænding), the lord mayor of Copenhagen and a group of city councillors, the minister of finance, top trade union leaders, and a group of private businesses led by a subsidiary of Babcock-Wilcox, together with architectural firm Bjarke Ingels Group (BIG). The latter's spectacular design proposal for an iconic energy plant with a ski slope on the rooftop, and a smokestack puffing giant smoke rings to raise climate awareness, played an important role in convincing decision-makers of the project's potential for city branding, as we will show later. We use the term "green coalition" to describe the other side in the conflict. This uncoordinated group consisted of municipal planners and staff from the Technical and Environmental Administration (TEA) who were adhering to the principles of the city's sustainability strategies of waste recycling and carbon neutrality. This coalition was also joined by the environment minister, the energy minister, a group of city councillors of fluctuating size, environmentalists (e.g., the Danish Society for Nature Conservation), critical media, and researchers who all argued for a small-scale, local waste-treatment solution to minimise carbon emissions. The green coalition initially convinced a city council majority to reject the Copenhill project, but their expertise became increasingly contested and, in the end, their knowledge claims were ignored.

2.1. Waste-to-Energy and District Heating in Copenhagen

Waste-to-energy became an important part of Danish urban energy systems after the 1973 oil crisis, which prompted a new national energy policy to stimulate local and municipal ownership of energy production to diversify supply (Rüdiger, 2007). Oil-fired power plants were phased out in less than five years and replaced by coal, natural gas, waste-to-energy, and later biomass, wind power, and other renewables. This was linked to an ambitious plan for creating a collective heat supply for all urban areas. As a result, the Danish capital Copenhagen (population within municipal borders—640,000; metropolitan area—2 million) today has one of the world's largest district heating systems, covering 98% of all households (HOFOR, 2022; Sovacool, 2013). In the metropolitan area's complex multi-energy system, advanced control functions allow renewable energy from wind, biomass, and solar to enter the system first, then waste-to-energy is used as a secondary source, while purely fossil-based energy is used as back-up, especially on very cold days. It is a political decision to consider energy from waste incineration, which releases both fossil and biogenic CO_2, as an intermediate between green and black energy (European Parliament and Council Directive of 19 November 2008, 2008). Four waste-to-energy plants feed into the metropolitan district heating network, all of them owned by different non-profit intermunicipal companies (Kohl, 2019). One of the plants is Copenhill, central to this case study, which in 2020 produced 1,658 GWh of energy and provided heat and electricity to more than a third of the city's households. The City of Copenhagen is the majority owner of the intermunicipal company ARC, which owns and operates the Copenhill plant. The legal form of an intermunicipal company like ARC is an *interessentskab* (partnership), a consensus-seeking structure with board representatives appointed proportionally among city councillors from the owner municipalities. Legally, the partnership is semi-autonomous in decision-making, but city councils control all their larger projects because a municipal guarantee is required for bank loans to the partnership.

2.2. Copenhagen's Climate Plan and Decarbonisation in Waste Incineration

In 2012, the City of Copenhagen adopted an ambitious climate action plan with the aim of becoming the world's first carbon-neutral capital by 2025. The plan was an updated version of an earlier vision, adopted already in 2009. The plan's concept of "CO_2 neutrality" is limited to functions that are directly influenced by the city government and does not directly involve the consumption-based carbon footprint of the municipality's citizens. The Copenhagen plan established climate action targets in four thematic areas: energy production, energy consumption, mobility, and internal municipal procedures, all in all, aiming to cut 1.2 million tonnes of yearly CO_2 emissions by 2025 (The City of Copenhagen, 2012). The key component—accounting for 74% of reductions—was energy production, where new wind turbines, the conversion of a power plant from coal to biomass, and a new waste-to-energy plant, together with the separation of plastic from waste, were defined as main initiatives. The latter initiatives are linked to an already established long-term zero-waste strategy that aimed to reduce carbon emissions from waste incineration to zero. The plan identified the existing levels of waste incineration as a major obstacle to the decarbonisation strategy:

> When plastic contained in waste is incinerated, it contributes to the energy supply but it also emits CO_2, because plastic is an oil-based product. If plastic content in waste remains unchanged, CO_2 emissions from waste incineration are expected to reach 100,000 tonnes by 2025. (The City of Copenhagen, 2012, p. 40)

To solve this problem, the plan established that parallel to removing plastic from the waste stream, waste incineration should be partly replaced by alternative methods of waste treatment, including biogas production. The plan dictated that the arrangements for a new waste-to-energy facility with significantly reduced incineration capacity "must therefore be assessed and subsequently constructed in partnership with the heating companies." (The City of Copenhagen, 2012, p. 37). The "heating companies" here refer specifically to ARC, which was at the same time drafting plans for the new Copenhill megaplant.

Carbon in waste can be almost completely combusted into CO_2, resulting in one tonne of CO_2 emissions per tonne of incinerated waste, making waste reduction and recycling effective methods of curbing carbon emissions. There are differences in the composition of waste, however, and it has been shown that the fossil carbon content emitted from sorted Danish waste can be as low as one-third (Bisinella et al., 2021). On the other hand, imported waste has "a significantly higher fossil share" because it contains more plastic (Danish Energy Agency, 2021, p. 8; see also Capion & Sørensen, 2021, p. 5). For this reason, municipal energy planners were explicitly opposed to the ideas of increasing incineration capacity or importing waste to fuel waste-to-energy plants in Copenhagen. As we will later show, this issue of incinerating less—or more—waste became the core of the conflict between the green coalition and the corporatist coalition. As of writing in 2022, no progress has been made in reducing carbon emissions from waste incineration. The purpose of Copenhagen's planned decarbonisation efforts, including the construction of the new waste-handling facility (Copenhill), was to avoid annual emissions of CO_2 increasing to 100,000 tonnes by 2025. Instead, new projections indicate that CO_2 emissions from Copenhill will reach 560,000 tonnes CO_2 per year

by 2025 (ARC, 2021; Bisinella et al., 2021). In other words, the realised Copenhill project alone will exceed the total projected worst-case CO_2 output from waste incineration by a factor of 5.6.

3. Theoretical and Methodological Framework

This article is inspired by the phronetic planning research tradition, which favours case studies and follows a tradition of power studies running from Machiavelli to Foucault and Bourdieu. Phronetic planning research works with four generic value-rational questions:

1. The planning context: Where are we going with planning?
2. The power analysis: Who gains and who loses, and by which mechanisms of power?
3. The critical judgement: Is this development desirable?
4. What should be done? Or what can actors learn with regards to future action and capacity building? (Flyvbjerg, 2002)

In their critique of communicative planning theory, Flyvbjerg as well as other authors argue that real planning processes are often far from communicative ideals. Real planning is not immune to dubious practices and manipulations by powerful actors that undermine transparency and democratic principles (Certomà, 2015; Huxley, 2018). "Dark planning" (Flyvbjerg & Richardson, 2002) is a strong metaphor for planning not done rationally nor according to democratic procedures; however, as an analytical concept it is a little vague. Flyvbjerg (2012) argues in favour of a case study methodology focusing on the identification of "tension points" as a way to investigate how complex power mechanisms influence or short-circuit the rationality and transparency of democratic planning. Tension points mark critical situations and stages, where power is exercised, often behind closed doors, in so-called dark planning processes; their key attributes are "that they involve dubious practices by key actors, [and] contestable knowledge used to make policy arguments" (Flyvbjerg et al., 2012, p. 288). This critical approach has been applied to notoriously underperforming megaprojects (Flyvbjerg et al., 2003).

According to Flyvbjerg (1998), a general asymmetry between rationality and power in modern democracy induces a basic weakness in planning. In dark planning cases planners can end up making plans that are not rational but reflect the wishes of the most powerful actors. In short: Power beats rationality. In our analysis (Section 4) of the tension points in the planning process of the Copenhill project, we are inspired by Flyvbjerg's (1998) claims about the dynamic relationship between power and rationality in planning. An additional source of inspiration for our theoretical framework is the literature on neoliberalism and planning. Baeten (2018) argues that neoliberal planning as idea and practice does not constitute a clear break with previous planning regimes. We argue that the Copenhill case reveals ad hoc corporatist power in an institutional context where energy supply is *not* privatised, but where private sector interest strongly influences public investments and strategies. Sager (2011) differentiates between 14 different neoliberal substrategies, of which city marketing is especially relevant for our case. State actors mobilise architecture as a way of making political-economic strategies meaningful, as shown by Sklair (2013), who argues that "iconicity"—understood as the fame, aesthetics and symbolic meaning of buildings and architects—has become a key component of urban megaprojects.

Three sources of empirical data were collected and analysed:

1. The main source was a huge variety of documents (Bowen, 2009), including official planning documents, recorded city council discussions, official minutes from meetings in the TEA and from ARC energy company board meetings, together with a self-created database of 123 news articles, many of them from financial media *Finans* and technical daily *Ingeniøren*. Furthermore, we got access to some 2,000 pages of internal municipal documents, including emails, from the TEA via freedom of information requests.
2. Interviews with key actors in the planning and decision-making process, including semi-structured in-person interviews with two former deputy mayors, and three former city councillors. These key decision makers represented three different centre-right, centrist, and centre-left political parties, and two of them also held board positions at ARC. Interviewees were selected because they were central in either the corporatist coalition or the green coalition, and their diverse voting patterns in the city council reflected different attitudes to the Copenhill project at different times. We also interviewed a lobbyist and an energy consultant close to the project. All seven interviews were conducted in 2018. For the interview guide, see Kohl (2019, p. 67). Interviewees were not anonymous. They were offered the opportunity to correct their quotes, and some did. Three persons declined our request for an interview.
3. Participant observation and informal "corridor talk" with politicians, planners, and municipal administrators who shared inside information or opinions with us outside the context of a formal interview (Kohl, 2019). Not surprisingly, we found that the informal corridor talks often differed from the statements the same politicians would allow quotation from.

Our positionality most likely influenced the data gathering described in 2 and 3. Both authors entered the

city council in 2014, one year after the city council had approved the Copenhill project. Neither of us was involved in the decision-making process, nor were we engaged in the public debate surrounding the planning conflict. Our research started in 2018. We likely had easier access to corridor talk and even research interview appointments because we were city council members at the time of conducting research. To not replicate views and opinions, we did not use members of our own party group as sources.

4. Energy Planning Failure: From Carbon Neutral Strategy to a Spectacular Megaplant and Increased Emissions

In the following section, we provide an overview of the planning process of the Copenhill energy plant, and then present findings related to four strategic tension points in the process and reflect on how they shed light on urban sustainability transitions. The four tension points are the city council majority's initial rejection of ARC's proposal for the Copenhill megaplant (Section 4.2), the prognosis war between ARC and TEA (Section 4.3), the corporatist coalition putting pressure on the city council (Section 4.4), and lastly, the post-factual Mayors' Deal, which marks a U-turn and a final political approval of the megaplant project (Section 4.5). We present the analysis of the case as a narrative chronology of key tension points to find a plausible explanation for the research question: *How could a corporatist coalition undermine Copenhagen's plan to become carbon neutral by 2025?*

4.1. Overview of the Planning Process

Copenhagen's district heating is supplied by different municipally owned energy companies running their own plants. One of the companies is ARC which specialises in waste-to-energy. All companies are largely autonomous in decision-making but always depend on the city council to approve a loan guarantee when capital is required for major investments. Planning proposals coming from the energy companies are analysed and commented on by the municipal planning department—the TEA—before being passed on to the city council. When ARC presented plans for the Copenhill megaplant to TEA in 2011, the key framework for TEA's assessment of the project was the city council's strategic plans for "zero waste" and carbon neutrality by 2025. Both plans established environmental targets that required less incineration of waste, contrary to ARC's proposal. In theory, the TEA is a more powerful actor than a company like ARC, because a proposed project that municipal planners label as economically or environmentally unsound is less likely to later receive political support from the city council. However, as we will show in this section, ARC succeeded in building a more powerful coalition that captured the sustainability agenda and pushed approval of the megaplant project through the city council. In this process, confrontation over what could be considered as relevant forms of knowledge played an important role. As we will show in Section 4.3, ARC first blocked TEA's attempts to co-create knowledge and then initiated a power struggle to replace the green coalition's expert knowledge regime with their own.

Timeline of key events in the planning process of Copenhill:

- 2008: ARC begins a project planning process aiming to replace an outdated, but functioning, waste-to-energy plant.
- 2009: CCC adopts a vision for becoming carbon neutral by 2025. Climate initiatives include carbon-neutral energy production in municipal energy companies like ARC.
- January 2011: ARC reveals the result of an architectural design contest for the new plant. The winner is rising star architect Bjarke Ingels, who then meets Copenhagen's lord mayor to present the spectacular design.
- March 2011: ARC presents technical plans and project budget for a megaplant to TEA.
- November 2011: TEA presents the result of their analysis of the Copenhill project. TEA recommends scrapping the project because it is far over capacity. If realised, the project will boost carbon emissions and jeopardise the carbon neutrality strategy and the city's finances.
- November 2011: The city council rejects ARC's request for a loan guarantee.
- December 2011: TEA invites ARC to a collaborative planning workshop. ARC rejects the invitation.
- December 2011: A "prognosis war" starts where ARC and TEA present conflicting predictions of the feasibility of the proposed plant. The environment minister intervenes in favour of TEA.
- January 2012: ARC announces a €135 million contract with a machine provider in the constituency of the finance minister. The finance minister intervenes in favour of ARC.
- January 2012: Top trade union leaders put pressure on the city council.
- Spring 2012: Secret negotiations between key local politicians.
- August 2012: Copenhagen's lord mayor announces a compromise that allows for the building of the megaplant but limits incineration capacity and fuels, so as to not jeopardise the city's carbon neutrality strategy. The city council approves a loan guarantee based on the new plan, and construction of Copenhill begins.
- 2016: Restrictions on incineration are removed bit by bit by the city council, citing Copenhill's poor economic performance. Annual CO_2 emissions from the plant are expected to reach 560,000 tonnes by 2025.

4.2. First Tension Point: A City Council Majority Rejects Amager Resource Centre's Proposal for the Copenhill Megaplant

By 2011, the municipal energy company ARC is headed by an energetic CEO, who begins positioning ARC centrally in a coalition that will soon include heavyweights from business and labour organisations, together with key politicians. With support from the city council-appointed chairman of ARC's board, former Deputy Mayor Mogens Lønborg, plans are being developed for building a new waste-to-energy plant that would increase existing incineration capacity by 40%. Lønborg later said ARC's expansionist plan fitted well with Copenhagen's overall strategy of creating growth and being on the map internationally, "because we put the level of ambition as high as we did: To build the world's best waste-incineration plant. Both in environmental standards and in energy efficiency" (Kohl, 2019, p. 41). However, the project's environmental focus—on minimising toxic emissions resulting from the combustion of waste—is not aligned with Copenhagen's target of eliminating carbon emissions.

In January 2011, ARC reveals the result of an architectural design contest. The winning proposal, called "Copenhill," comes from the architectural firm BIG and incorporates a ski slope on the rooftop. The design is based on Ingels' self-described architectural philosophy of "hedonistic sustainability," as an alternative to the "sad and depressing" kind of sustainability where people make sacrifices to their lifestyles (Garcia et al., 2021, p. 28; Ingels, 2009). BIG also hires a local rogue celebrity and self-taught designer to make the plant's smokestack puff enormous vapour rings for every tonne of CO_2 released from incinerated waste, as a gimmick to increase climate consciousness. Copenhagen's Lord Mayor Frank Jensen meets with architect Bjarke Ingels and becomes an enthusiastic supporter of the unconventional project. In this way, the Copenhill project becomes part of a global trend where iconic architecture plays an increasingly important role in urban megaprojects and where promotors skilfully use spectacular design to create political goodwill for so-called landmark projects (Andersen & Røe, 2017; Sklair, 2013). Urban elites, aspiring for their city to become a "world city," may think of the city as a node in a global network of relationships where linkage to the global economy is fundamental to ensuring sustained local development (del Cerro Santamaría, 2013; Sassen, 1991). The City of Copenhagen's ambition to be recognised as an "eco-metropolis of the world," is, as noted by Simpson (2018, p. 33), closely linked to a Danish export agenda of providing sustainable urbanisation solutions in engineering and architecture, an agenda that has been very advantageous for firms like Ingels' BIG. This also helps explain why the idea of an iconic energy plant that could put Copenhagen "on the map" was attractive to local politicians focused on city marketing (see Sager, 2011).

In March 2011, the city council receives a presentation of an "architectural landmark" energy plant, which ARC claims would become a *fyrskib* (lightship) for waste-to-energy technology (TEA, 2011a, p. 3). ARC requests a loan guarantee of 3.95 billion DKK, some €530 million, of which the city council is to provide the larger part. TEA's planners are anything but happy about ARC's plans for boosting waste incineration capacity by 40% and during the following months they draft a highly critical motion on the project to the city council. TEA notes that ARC's plan to increase incineration capacity to 560,000 tonnes per year is far over the target and that the city council has previously asked ARC to investigate reducing actual capacity from the current 400,000 tonnes per year to as little as 240,000 tonnes per year when building a new plant. The rationality behind reducing capacity is that increased sorting and recycling are making overall waste amounts decrease. In short, there is not enough local waste to fuel such a huge plant.

TEA (2011b) also writes that ARC's "plans will unavoidably lead to a negative effect on the environment" because surplus capacity would most likely be used for ineffective incineration of biomass, or even waste import, which would seriously jeopardise Copenhagen's aim to become carbon-neutral by 2025. On top of that, TEA states that the Copenhill project will likely lead to long-term economic loss for the city and runs against both national and EU climate plans. TEA's arguments against the project are at this point rooted in sustainability rationality and in local knowledge of the effects of implementing the municipal zero waste strategy: The amount of unsorted waste destined for incineration is decreasing. ARC argue for the project by appealing to the perspective of city branding and the potential for exporting Danish private-sector technology. The CEO of ARC also claims that waste amounts are increasing. In ARC's perspective, waste is fuel, and more waste means potential for increasing ARC's production of heat and electricity.

In November 2011, key councillors from the city council's majority bloc meet to decide on the critical motion about the Copenhill project, drafted by TEA. TEA recommends that no loan guarantee should be provided. The majority bloc consists of four parties (social liberals, social democrats, left, and far-left) who together hold 41 out of 55 seats on the council, with the lord mayor's 17-member social democratic group being the largest. The lord mayor, who is fascinated by the project, faces a dilemma. Apparently, a majority on the city council opposes the megaplant. Also, at the national level, a political bloc consisting of the same four parties have only weeks earlier won parliamentary elections, and the new environment minister has already publicly aligned herself with TEA's position that Copenhill should not be built (Pedersen, 2011). The majority bloc strikes a compromise and agrees that they will not allow the city council to provide a loan guarantee for ARC's project for the time being. They also issue a public statement

echoing TEA's criticism of the proposed megaplant and declare that they will put the decision-making process on ice until new general guidelines on waste handling are issued by the government (TEA, 2011b). The legally non-binding declaration by the majority bloc marks the climax of the first tension point. The media picks up on the declaration and interprets it as a final decision. Environmentalist campaigners are jubilant and celebrate with champagne what they think is an irreversible "no" to the plant. "We thought we had won," a chief lobbyist of the Danish Society for Conservation of Nature says later (Kohl, 2019, p. 44). The new energy minister joins the environment minister in congratulating the city council for prioritising a sustainable solution. The green coalition—the TEA, environmentalists, critical media, researchers, the environment minister, the energy minister, and a group of city councillors—seemed to have prevailed.

4.3. Second Tension Point: The Prognosis War Between TEA and ARC

The second tension point occurs during the months of December 2011 and January 2012, when TEA and ARC engage in a heated debate about predictions of future amounts of waste in the city. We call this episode the "prognosis war" and it highlights the important role of knowledge as a contested resource in planning. This tension point shows that even with solid institutional backing from the city administration, collaborative planning approaches and attempts to co-create knowledge can fail when met with resolute opposition from powerful actors. The episode is also illustrative of Flyvbjerg's (1998) claim that rationality in planning is context-dependent, and that the context of rationality is power. More specifically, the confrontation between TEA and ARC over waste prognoses underlines the insight that "what is presented as reality by one set of experts is often a social construct that can be deconstructed and reconstructed by other experts" (Flyvbjerg et al., 2003, p. 61).

The apparent support from the city council majority and ministers in the national government is encouraging TEA to prepare plans for a new waste-management facility focusing on recycling, instead of incineration, according to the city's sustainability strategy. One of the first steps is to organise a workshop to co-create knowledge with important stakeholders. Co-creation of knowledge can be defined as "iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future" (Norström et al., 2020, p. 33). TEA's collaborative planning approach (Sager, 2015) corresponds to the principles established in the city's climate action plan (The City of Copenhagen, 2012, p. 37; see also Nyseth et al., 2019). Accordingly, in December 2011, TEA invites ARC representatives, together with environmentalists from the Danish Society for Conservation of Nature, private energy consultants, and other stakeholders to jointly work out factual foundations for further planning and decision-making on the issue. Together with the invitation, TEA sends out a copy of a new report on the urban waste situation with a prognosis for decreasing amounts of waste in the future (Internal e-mail communication between TEA, Ea Energianalyse, and ARC, 2011, obtained by authors through freedom of information act requests). The report is prepared by a private consultancy, commissioned by TEA, and TEA invites workshop participants to comment on the findings.

On the day of the workshop, the invited representatives from ARC do not show up. The reason for ARC's boycott is explained a few days later. ARC's CEO writes that she finds the report "biased," "incompetent," of a "low standard" and not worthy of discussion (Internal e-mail communication between TEA, Ea Energianalyse, and ARC, 2011, obtained by authors through freedom of information act requests). ARC then goes on to hire their own private consultancy to produce a counter-report that gives radically different projections of increasing waste amounts thus supporting the business case for Copenhill, albeit at the cost of significantly increasing carbon emissions (Internal e-mail communication between TEA, Ea Energianalyse, and ARC, 2011, obtained by authors through freedom of information act requests). ARC's waste prognosis is based on the presumption that waste volume increases parallel with increases in GDP. TEA responds that ARC's model does not match actual developments in Copenhagen (Internal e-mail communication between TEA, Ea Energianalyse, and ARC, 2011, obtained by authors through freedom of information act requests). TEA's prognosis is based on detailed knowledge of the local situation, including demographic patterns, developments in waste sorting and handling, and levels of compliance with the city's zero waste vision. TEA also points to experiences from the City of Vienna, where increased sorting has drastically reduced the amount of waste for incineration. On the first working day of January 2012, the environment minister intervenes in the conflict by tasking her Environmental Protection Agency to arbitrate by ordering a third private consultancy report. This third report approves of TEA's arguments (Incentive Partners, 2012).

The "prognosis war" does not, however, end with a compromise or a peace deal. ARC simply ignores the report commissioned by the environment minister. Later developments show that ARC's predictions of increasing waste amounts did not materialise, because waste generation did not increase on par with economic growth, and initiatives from the city's zero waste plan further contributed to sorting and recycling, creating ever less need for incineration (Kohl, 2019, pp. 43–48). In the confrontation, ARC avoids a factual discussion of key planning premises and ignores TEA's claim to specific local knowledge. This leads to a power struggle between two different expert knowledge regimes.

4.4. Third Tension Point: The Corporatist Coalition Puts Pressure on the City Council

The two first tension points show that both coalitions present expert knowledge claims. The green coalition also presents local knowledge claims that are ignored by the other side. The third tension point shows that the corporatist coalition is strongest in political knowledge understood as the ability to play the power game. This tension point also reflects the fact that the tide is turning against the green coalition, even though the public and media are convinced that the Copenhill project is dead. For the public, it comes as a major surprise when ARC in January 2012, announces a contract worth more than one billion DKK (some €135 million) with machine provider Vølund, a Danish subsidiary of US thermal energy giant Babcock & Wilcox. The contract is Vølund's largest ever (Nielsen, 2016). According to media reports, Vølund has extraordinarily good connections to the upper echelons of the national government through Finance Minister Bjarne Corydon, a social democrat who is arguably the most powerful figure after the prime minister. Vølund is an important company in Corydon's constituency and a trade union leader from the firm has managed Corydon's recent election campaign (Nielsen, 2016). ARC takes advantage of this situation and secretly writes to finance minister Corydon, claiming there is a risk of "serious consequences" for Danish green technology export and loss of jobs worth 4,600 years of work, unless Corydon can convince the environment minister and Copenhagen's city council to support the Copenhill project (ARC, 2012).

A few days later, Corydon sends a letter to the CEO of Vølund, stating the government's support for the Copenhill project (Kohl, 2019, p. 68). The environment minister co-signs the letter but refuses to comment on her change of mind when asked by journalists. Only four years later does she claim in a Facebook post that she was "bullied" into doing it (Martini & Sandøe, 2016). Vølund immediately makes the letter public to put pressure on Copenhagen's city council. At the same time, the leaders of two of Denmark's most powerful trade union federations personally contact city councillors from the four-party majority bloc to persuade them to "make the right decision" on Copenhill, so an "international showcase" will not be lost (Simonsen, 2012).

Research on Danish power elite networks based on a relational view of power (Larsen, 2015) shows that well-connected top trade union leaders are among the single-most powerful individuals in the country. Top unionists form the inner circle of the power elite, together with top business leaders, while only a few politicians make their way into this group. Larsen (2015) mapped and ranked the 423 most powerful Danish individuals around the time of the planning conflict over Copenhill. According to this power elite ranking list, the leader of the metal workers federation, Thorkild Jensen, and the leader of the HK salaried workers federation, Kim Simonsen, ranked 1st and 9th, respectively. These are the same two trade union leaders who put pressure on the city councillors.

Finance minister Corydon has not publicly commented on his intervention in the city's energy planning, an area not corresponding to his own ministry, but to the ministries of environment and energy. The exact scope of his intervention is also not clear to the authors of this article. Interestingly, all city councillors interviewed by us said that they were *not* put under pressure and that they did *not* discuss Copenhill with party colleagues in government. However, some of them say, in informal corridor talks, that they are sure other councillors were put under strong pressure from government ministers (Kohl, 2019, p. 50). Other sources point in the same direction. Vølund's CEO publicly thanked Corydon for making Copenhill happen (Mose & Hegelund, 2014). One social democrat MP even published a book, praising Corydon's efforts to ensure the valuable Copenhill contract ended up with Vølund (Dybvad, 2015, pp. 161–162).

4.5. Fourth Tension Point: The Post-Factual Mayors' Deal

After the corporatist coalition has put pressure on the city council majority bloc, a lengthy phase of negotiations held behind closed doors between the Lord Mayor and other key local politicians follows. ARC management also participates in some of the meetings. This negotiation process culminates in the summer of 2012 when the lord mayor presents a new political agreement, called the "Mayors' Deal" (CCC, 2012a). This new plan is presented as a compromise. On one hand, it implicitly approves ARC's plans to build a megaplant with a 40% increased incineration capacity. On the other hand, it does not allow ARC to use this increased capacity, it bans waste imports, and it restricts the use of other biomass fuels. Apparently, the compromise accommodates both sustainability concerns and the agenda of city branding, export promotion, and job creation. However, the deal completely undermines the business case for the megaplant. Former Deputy Mayor Lønborg, at that time serving as chairman of ARC's board, told us that he saw the sustainability restrictions on waste import as absurd: "It was an insanely suicidal thing to say: We don't want waste if it should become necessary. And at that time, I thought, well, well, reality will present itself someday" (Kohl, 2019, p. 53).

The Mayors' Deal is accepted by most city councillors who had previously opposed the megaplant project. Based on the deal, TEA drafts a new motion to grant a loan guarantee. The city council approves the motion at the end of 2012 with only one vote against it. TEA's motion states that the Copenhill project has a strong business case and will most likely contribute positively to the city's carbon neutrality plan. These surprising new claims are not backed up by new projections or calculations but simply refer back to the stated intent of the Mayors' Deal in a sort of post-factual retrospective

planning (Kohl, 2019, pp. 54–55). The only councillor voting against the loan guarantee adds a declaration to the protocol, stating:

> This motion from the Technical and Environmental Administration is in complete conflict with the motion presented to the committee the first time the case was debated….One can only suspect that this motion is a politically ordered make-believe, rather than a factual evaluation of the case. (CCC, 2012b, Point 9)

Following the approval of the loan guarantee, construction work on Copenhill starts. In 2016, before the new megaplant is operational, the lord mayor announces an updated version of the Mayors' Deal that lifts the restrictions on using Copenhill's full incineration capacity and subsequently scraps the ban on imported waste. This is done because there is indeed too little waste in Copenhagen to power the costly, oversized plant. In effect, ARC's original project plan is realised. "Reality," as former Deputy Mayor Lønborg predicted, has presented itself. This U-turn suggests that rational arguments did not matter in the conflict over Copenhill. What mattered was who had the power to enforce their preferred version of reality, or as Flyvbjerg argues, power defines reality.

The result was that the original green coalition was dead. Instead, the corporatist coalition became the *new* "green coalition" with the Lord Mayor at its head, eager to promote Copenhill as an integral part of Copenhagen's sustainability concept that other cities could follow, including in the form of buying Danish waste-to-energy technology. As the Lord Mayor told a US media outlet: "I want my colleagues in other cities to know that waste incineration works, the technology is there. And it's very good for the economy" (Parker, 2018). Since 2019, ski enthusiasts have been plowing down the sloping roof of Copenhill, but another of the planned spectacular architectural features backfired—the extravaganza of puffing smoke rings to mark every tonne of CO_2 emission. BIG architects had announced they would "turn fiction into fact by transforming the smokestack, a symbol of the industrial era, into a communicator for the future" (Mairs, 2018), but when the celebrity designer working on the project was handed a life sentence for committing murder aboard his submarine, the smoke ring project was dropped in silence (Nelson, 2018). As of 2022, Copenhill still successfully attracts positive international media attention and business delegations from all over the world, and increasingly relies on imported waste and biomass.

5. Conclusion

The Copenhill case is an example of how "green growth" strategies can undermine urban sustainability policies. We showed how Copenhagen's city administration integrated communicative and environmentalist objectives in a strategy to become the world's first carbon-neutral capital. However, a corporatist coalition successfully pushed for an iconic waste-to-energy megaplant project, with no regard for decarbonisation targets. A green coalition tried to stop the project, arguing against investing in increased waste incineration capacity at a time when waste amounts were decreasing because of greater recycling. In Section 2, we analysed the context of the case to answer the phronetic question: Where are we going with planning (Flyvbjerg, 2002)? We found that the Copenhill project contributes to a multiplication in CO_2 emissions from waste incineration, thereby seriously undermining Copenhagen's carbon neutrality targets. In Section 4, we answered a second phronetic question: Who gains and who loses, and by which mechanisms of power? We showed how the corporatist coalition overruled the green coalition by blocking attempts to co-create knowledge, rejecting independent waste prognoses, and strong-arming the city council. We shed light on the power struggle between two different expert knowledge regimes and showed that the green coalition was strong on local knowledge, while the corporatist coalition was strong on political knowledge. We identified strong elements of dark planning practices, including post-factual sustainability claims in planning documents, and closed decision-making processes. In the end, the concept of sustainability was utilised as an empty vessel to promote green city branding and particularistic business export agendas.

The Copenhill case highlights the importance of knowledge and counter-knowledge as a resource in planning. The case suggests that green actors such as sustainability planners, environmentalists, local politicians, and other knowledge actors, such as critical media and researchers, all have lessons to learn about planning in the face of power (see Forester, 1982. The first lesson is that to successfully challenge the adversary in a planning conflict (e.g., a corporatist coalition) it is essential to understand their strengths and claims to legitimacy. In this case, the corporatist coalition presented a seductive project with an iconic design that promised benefits like city branding, and a ski slope open to the public. The corporatist coalition also linked the objective of promoting green technology exports with job creation, and successfully enlisted support from a traditional tripartite elite of top trade union leaders, top political actors from state and city, and private sector figures.

The second lesson is that green actors, based on their reading of the power configuration, should develop tactical and strategic capacity to openly challenge the discourses of the adversary. This includes the ability to mobilise support for planners and other knowledge creators when attacked. Lack of transparency in planning and decision-making processes should be communicated to the public and other green stakeholders. Expert knowledge must be combined with other forms of knowledge, especially political knowledge. It is also important to argue convincingly for the advantages of alternative

plans. If green actors in the Copenhill case had better developed and communicated proposals linked to job creation—e.g., recycling initiatives, community engagement, and a broader socio-economic agenda—they might have been able to attract important new coalition partners from trade unions, the private sector, and the public. This in turn could give the sustainability agenda a stronger position in planning conflicts. Future sustainability action might also benefit from engagement with the concept of energy democracy (Paul, 2018; Szulecki & Overland, 2020) understood not only in terms of decarbonisation but also as a process of energy transition driven forward by popular participation.

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Conflict of Interests

Ulrik Kohl served as a member of ARC's board from 2018 to 2019 and was paid around €250 per month. This was in no way related to the research presented here.

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Article

Mobilising Situated Local Knowledge for Participatory Urban Planning Through Storytelling

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Abstract
Participatory urban planning does not take place outside of social systems of privilege and discrimination; likewise, the negotiation of knowledge claims in planning processes is embedded in social relations defined by "gender," "race," and "class." In this article, we argue that positionalities play out in the social construction of knowledge in participatory planning and that, consequently, a certain type of knowledge—typically represented by well-educated and resourceful residential groups—is privileged over other forms of everyday knowledge. We present storytelling as an inclusive approach to co-producing knowledge and reflecting on the extent to which the findings can be applied to participatory urban planning. This article is based on a three-year inter- and transdisciplinary research project based on real-world laboratories in two German neighbourhoods. Regarding feminist geographies, we first explore the role of power, positionality, and situated knowledge in shaping participatory planning, both theoretically and empirically. We outline the extent to which the methodological framework and the socio-spatial setting have an impact on the co-production of knowledge. We present insights from two storytelling interventions and reflect on the possibilities and limits of narrative knowledge production for participatory urban planning.

Keywords
participation; positionality; power relations; situated knowledge; storytelling

Issue
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1. Introduction

> In planning, we see not only the filtering of issues and ideas but the filtering of people, by skin colour, gender, ethnicity, or territory. Such power shapes the flow of information and identities, too, as some people are seen, heard, and valued, recognized and respected, while others are treated as invisible, voiceless, separate, worthless. (Forester, 1999, p. 184)

The professional self-understanding of urban planning has changed significantly over the past decades—from the god-father-model of rationalist planning to a collaborative planning model (Healey, 1997; Innes, 1995). Often with reference to the work of Habermas (1981) and his understanding that knowledge is socially constructed, the collaborative model shows that planners need to address power asymmetries when it comes to decision-making and consensus-seeking (Albrechts, 2003, p. 906). The social construction of planning and the employed concepts, representations, scales, etc. are a key focus of the interpretative tradition in planning (Davoudi, 2012). In this tradition, knowledge is fuzzy and context-dependent instead of objective and positive:

> Instead of thinking about knowledge as having an instrumental place in the planning process (i.e., to inform action), it is more useful to think about planning as a process of knowing and learning. This means articulating knowledge and action as recursively

> interlinked rather than considering the former as a precondition to, or coming before, the latter in a linear, causal chain. (Davoudi, 2015, p. 317)

According to Davoudi (2015, p. 323), planning as a practice of knowing is "a dynamic process that is situated and provisional, collective and distributed, pragmatic and purposive, and mediated and contested." Against this background, a large part of planners' work is communication—with different groups of stakeholders, citizens, politicians, etc. In participatory planning processes, they co-produce knowledge about problem definitions, local contexts, stakeholders' opinions and needs, and scopes for action. However, in line with the introductory quote by Forester, studies show that it is difficult to design these processes in a way that planners successfully reach out to and mobilize the broad variety of stakeholders potentially affected by a planning process. As Flyvbjerg (1998) argues, power relations are inherent to any communication, no matter how elaborate and transparent the design of the setting is.

In German urban planning, particularly "deprived" groups—such as poor households, with low education levels and ethnic minority or immigrant backgrounds—have been found to be missing from planning debates (Huning et al., 2021; Selle, 2019). Thus, results of participation often represent certain groups' perspectives and neglect those of others. Planners have discussed and tested more inclusive approaches to participation for years, e.g., in "strategic integration management" since the early 2000s (Gesemann, 2016, p. 284). Diversity is a regular political demand in objectives, methods and instruments of participation (Selle, 2019, p. 37). Nevertheless, a "code of interculture" for planning processes does not exist (Selle, 2019, p. 41).

In a three-year research project on interculture in participatory planning in two German neighbourhoods, we (the authors) and an inter- and transdisciplinary team of colleagues sought to identify the barriers that prevent people from participating. In two real-world laboratories (RWL), academics and local stakeholders researched and tested how planners can design more inclusive participation processes (Huning et al., 2021). We co-defined the research agenda and the problems with local stakeholders, residents and community activists before collectively testing potential solutions in an iterative process. Among other activities (see Section 3), we employed storytelling both as a methodological framework and as a socio-spatial setting to mobilize local knowledge in order to abandon "exclusive claims to authoritative knowledge and singular forms of expertise" (Good et al., 2017, p. 304).

In this article, we present selected findings from our research. We found, firstly, that the material and organisational design of participatory processes plays a crucial role in who becomes involved in the social construction of knowledge in planning. Secondly, we found storytelling to be a strong approach not only to mobilize those who tend to remain absent in "regular" planning processes but also to co-construct a common understanding of different stakeholders' needs and desires when it comes to participation at a rather abstract level. Concerning the role of emotions and their effects in planning, and particularly planning conflicts, we imagine that storytelling might also be a promising approach to develop planners' professional reflections on positionality further and to promote a better understanding of potential conflict sources and solutions.

The structure of the article is as follows. In Section 2, we discuss how different positionalities and situated knowledge play out in participatory planning and how planners can use storytelling to address this in collective knowledge production. In Section 3, we provide information on our concrete research context, database, and methods. Section 4 presents findings from our case studies, split into two parts: In Section 4.1 we show, based on the first project phase, how planners' communication privileges certain groups; Section 4.2 provides insights we gained from storytelling in terms of the type of stories and what can be learnt from them. In Section 5, we discuss the implications of our findings for participatory planning and potential limitations. In Section 6, we end with questions for future research.

2. Knowledge Co-Production Through Storytelling

Through participation, planners seek to elicit local knowledge related to everyday life and place (Bradley, 2018, p. 27). The interaction with urban residents initiated by planners for this purpose is the social space, shaped by the interaction and its design, where planners and participants co-produce a particular kind of knowledge. Yet planners have considerable influence over knowledge construction: They set the agenda, design the process, interpret the outcomes, take them away, and give them meaning. During the socio-spatial process of participation, planners and participants not only represent but also (re)construct and challenge identities. Unequal power relations play out throughout the interaction, as planning processes affect different groups of stakeholders in different ways, stakeholders who have different interests, but also different resources to assert their interests in the planning process. There is the risk that participation is selective (Listerborn, 2007, p. 61) if power relations are not addressed but obscured. Interest-driven power strategies influence the delimitation of what kind of knowledge is "valid" and important and which kind is not (Schuster, 2016, p. 195). Planners are not "detached explorers" who produce neutral, objective knowledge (Bondi & Domosh, 1992, p. 202). Instead, the stance of assumed neutrality implies concepts that are oppressive and fail to capture the complexity and contingency of the world. The privilege of being able to view one's position as "neutral'' or "generic" is linked to social categories such as "gender," "race," "class," "body," etc. that intersect (Listerborn, 2007).

Feminists speak of "situated knowledge" (Haraway, 1988, p. 581), which means that there can be neither a universalist nor a relativist standpoint, but positions and positionalities need to be contextualized within power-driven and embodied discourses and processes of knowledge co-construction. Power is also constituted through bodies and what they represent (Coole, 2007) since "bodies are always…interlocked with racial, cultural, and class particularities" (Pedwell, 2007, p. 72). In this context, the body is not a physical object separate from the mind, but a dynamic, organic site of meaningful experience and knowledge (Vacchelli, 2018, p. 2). Planners need to reflect on their own positioning in their interactions with others, such as local actors and stakeholders, rather than relying on their functional role as neutral experts who can make unbiased decisions, as the positivist planning tradition suggests (Davoudi, 2012).

These debates are not new to planning, and accordingly, new forms of knowledge production have been explored that aim to take into account the situatedness of knowledge and the positionalities of actors. In the context of the "pluralization of knowledge" (Fahrenwald, 2005, p. 49), experiential knowledge is currently being recognized again as a form of knowledge, and the cultural practice of storytelling exhibits characteristics of knowledge production to generate experiential knowledge (Schmidt, 2018, p. 4):

> Storytelling was long considered a non-objective, diffuse form of knowledge that was excluded from the scientific world. Recent research in organisational science and knowledge management, however, is concerned with how storytelling, as a methodological approach, brings individual experiential knowledge to the surface and generates shared knowledge. (Schmidt, 2018, p. 2; translated by the authors)

Experiential knowledge is "personal, situated, episodic, bodily, implicit and at the same time reflexive knowledge" (Reinmann & Vohle, 2005, p. 9; translated by the authors). Episodic knowledge stores knowledge about places and (significant) events associated with a concrete experience (Schmidt, 2018, p. 18). For the coming discussion, we hold at this point: situated knowledge includes experiential knowledge that is produced in the form of episodic knowledge through storytelling.

Conceptually, narrative theory distinguishes "storytelling," "story," and "narrative." Storytelling refers to the act of telling and sharing a story while someone is listening. According to traditional narratology, a story is a sequence of events that has a beginning, middle, and end (Fludernik, 2009; Martínez, 2017). Finally, a narrative is an account of successive events in time and space, often so extended and loaded with meaning that it contains a multiplicity of stories (Canning & Reinsborough, 2017/2020, p. 278).

Stories connect the knowledge of what happened with the understanding of why it happened and the sense of what it means to us, and they organize knowledge about the need for action and moral concerns (Sandercock, 2003, p. 19). Consequently, storytelling cannot only provide planners with new information (in the sense of "facts" or "data"), but it brings to the fore different socio-spatial positions, identities and (power) relations that are negotiated through stories.

For collective co-production of knowledge, storytelling allows planners to immerse themselves in the complexity of local values, contexts, and knowledge (Good et al., 2017, p. 294). Stories shape meaning and clarify what is important to individuals and what is not (van Hulst, 2012). According to Sandercock (2003, p. 12), "stories are central to planning practice: to the knowledge it draws from the social sciences and humanities, to the knowledge it produces about the city, and to the way it acts in the city." For planners, concrete local experiences and the everyday life of citizens can thus be a source of inspiration (Willinger, 2019, p. 106). By co-production, we mean the joint production through individual and social practices of different individuals or groups in cooperative collaboration (Krön et al., 2019, p. 35). Within co-production, urban dwellers are seen as self-aware experts who have resources, skills, and abilities in their everyday lives (Krön et al., 2019, p. 35).

Storytelling is not only about the product, i.e., the narrative or story, but also its communicative functions. Storytellers use their stories to explain something, to convince someone, to give advice, etc., including life histories and personal accounts (Nooijer & Sol Cueva, 2022, p. 237). Further, storytelling as a communicative procedure serves to form an identity, in which self-positioning and othering are negotiated. Last, but not least, it is a way to challenge dominant narratives that only contain a few voices, experiences and perspectives (Smith, 2017, p. 196). Storytelling can thus serve to name, analyse, and criticize power and domination relations. It can also help to uncover and become aware of positionalities, adopt an attitude of mindfulness and reflect on questions of ethics and responsibility, because "planning that ignores diverse ways of knowing undermines the experience and shared meaning of those living in a city" (Goldstein et al., 2015, p. 1285). In this regard, stories offer space for local perspectives that are difficult to mobilize and capture otherwise. Thus, they may provide planners with deeper insights into local situations, reflect on their own (personal or professional) positionality and raise awareness for voices that often remain unheard (e.g., Devos et al., 2018; Lake & Zitcer, 2012; Sandercock, 2003; Willinger, 2019).

3. Research Context, Database, and Methods

This article is based on research in two RWL (Schäpke et al., 2018) which aimed at an intercultural opening of participatory urban planning. RWL provide a concrete socio-spatial and temporal setting for academics, professionals and civil society to collectively define

local problems and then develop and test potential solutions. RWL combine theoretical-scientific knowledge with experiential knowledge from professional and community practice in an iterative process. The permanent exchange and collective interpretations of observations and provisional results lead to modified questions and new tools in the following round of co-research.

The research group consisted of academics from two universities' urban planning and design research departments, staff from local administrations, and representatives of planning offices and consultancies. During the research, we also engaged with administrative staff from other departments, local non-profits and community workers, and urban dwellers. In the first research phase, we conducted 23 interviews with local administrative staff and 19 interviews with civil society as theory-generating semi-structured expert interviews (Flick, 2011, pp. 166–167). These interviews served as an introduction to the local context. We then co-developed a broad range of activities (Huning et al., 2021), including participatory interventions in open space, guerrilla testing for a mobile-first participation tool, or interdepartmental workshops in the local administrations. During the iterative research process, story-based methods became more and more important (Seydel et al., 2021) to unravel local narratives and shed light on different perspectives. The project developed several participatory storytelling interventions in face-to-face settings ("story-corner," "story-circle") and later—due to the pandemic—as digital dialogue in a podcast series. In this article, we focus on face-to-face interventions. In the following, we first describe the material design of the settings before we explain our methodology and methods.

3.1. Material Design

As design researchers were part of the core research team, the project paid particular attention to the material design of the storytelling interventions, because the design has a significant impact on whether and how individuals or groups interact (Suchman, 2007). The arrangement of seating, the use of technologies, the concrete visibility in public space, or the distance or proximity between individual participants are all artefacts that actively shape social orders and interactions (Latour, 2014). At participatory events, the constellation of the "opposition" of audience and podium is still common, implying hierarchical arrangements and pre-structured patterns of communication. We tried to arrange the spatial settings so that they did not express power relations from the outset, but allowed for diverse forms of communication and signalled openness. While these material settings could certainly neither compensate for an unequal distribution of power nor hide social privileges, we hoped that they would offer the chance to give previously overlooked and overheard voices access to participation if they conveyed openness, multilingualism, and a willingness to listen.

The "*story-corner*" (see Figure 1) was a cabin with a solid roof and wall in the back and to one side. Participants could lean against the walls if they wished, and the walls offered protection from ambient noise. The opening to one side was important so that people around could see the conversations. A recording device was deliberately placed on the sidewall and not between the interlocutors so that the technology would not be a barrier between the bodies. In both storytelling interventions, the stories were recorded and transcribed with the consent of the participants. In contrast, the spatial concept for the "*story-circle*" (see Figure 2) was a geodesic wooden dome. The participants sat on small chairs in a circle. Through the particular height of the chairs, participants sat on a different level from people outside the dome. We covered some of the triangular surfaces of the dome construction with fabric to create a permeable storytelling space that offered adequate protection and

Figure 1. Story-corner. Photograph by Michael Shenbrot and illustrations by Zeynep Keskin. Source: Courtesy of © INTERPART.

Figure 2. Story-circle. Photograph by Michael Shenbrot and illustrations by Zeynep Keskin. Source: Courtesy of © INTERPART.

yet could be seen from outside. We assumed that people would find it easier to sit down if they felt the space was open and they could decide for themselves when to come and go.

3.2. Methodological Design

The "*story-corner*" was a wooden construction, designed to host a one-to-one conversation between the researcher and passers-by. Based on the episodic interview method, the setting was supposed to activate (narrative-) episodic knowledge, which consists of memories of situations, through narrative prompts (Flick, 2011, p. 273). A narrative prompt means to ask a person to talk about a specific topic in depth. They can be completely open-ended, but they can also include the topic of inquiry and time constraints that provide a framework or limitation for the narrator (Rosenthal & Loch, 2002, p. 7). For this project, a part of a narrative prompt was: "What does "Typical Neighbourhood A/B" mean to you? Please share with us stories about intercultural experiences and encounters in your neighbourhood."

Narrative-episodic knowledge is experiential and related to concrete situations; the sequence of the situation in its context is its central unit (Flick, 2019, pp. 238–239). To create a level playing field, the storytellers were free to not only react to the researchers" prompts but also propose topics they wanted to talk about. For those who were more comfortable telling their stories in another language, language mediators from local organisations supported the conversations. Without them, access to some of the stories would have been impossible. However, it was clear that the language mediators were part of the common knowledge production and that there was a difference between the author and the narrator, so some meaning might have been "lost in translation," while in other regards the translations made collective knowledge production possible in the first place. Overall, 17 residents aged 23–74 years old told their stories in the story-corner. Eight stated they had a migrant background, eight self-identified as female, and nine as male. Stories addressed negotiations of identity and belonging in the neighbourhoods, gender roles, lifestyles and experiences with analogue and digital participation. We avoided "labelling" the storytellers, but asked them to self-identify to interpret and map the stories, their positions, and their relationships (meaning they did not have to tell us). We validated our interpretations in group discussions. However, we realize that it is never possible to keep all personal biases out of an analysis.

In the next research phase, the "*story-circle*" took the idea of knowledge production through storytelling one step further based on the principles of the storytelling-salon, which combines narrative interviews and group discussions (Richter & Rohnstock, 2016). In participatory research, storytelling-salons serve as a strategic means of trust-building, self-empowerment, as well as negotiations and representations of individual and collective identities (Richter & Rohnstock, 2016; Sommer, 2017). In our research, the story-circle was a storytelling space where participants were free to leave and enter in the course of the conversation. A neighbourhood activist and a researcher shared the role of facilitator. For this article, we refer to a story-circle of six participants, four females and two males, two with a migrant background. The story-circle unravelled (a) different perspectives on urban development and community that were addressed in the conversation of a diverse neighbourhood group, and (b) people's desires and wishes for communicating with each other, related emotions, and ideas for the design of intercultural dialogue in low-threshold and inclusive settings. The aim was to observe to what extent it is possible to create a trustful space for conversation that reflects the diversity of the neighbourhood's population and different definitions of belonging.

In line with the research methodology of grounded theory (Glaser & Strauss, 1967), the analysis of the data from both the story-corner and the story-circle consisted of theoretical coding, a combined procedure of open and selective coding (Flick, 2019). Doing this collectively helped to structure and understand the data while constantly questioning the researchers" pre-assumptions and making new discoveries before returning to the field (Glaser & Strauss, 1967). We extracted individual narrative sequences as episodic knowledge. They consisted of (a) the initial situation ("how everything began"), (b) the events relevant for the narrative, selected from the wealth of experiences and presented as a coherent sequence of events ("how things developed"), and (c) up to the presentation of the situation at the end of the development ("what resulted"; Flick, 2019, pp. 227–228). These "small stories" provided "short (everyday) narratives that, in contrast to elaborate biographical narratives, are told in everyday…interaction contexts and in which communicative procedures of identity negotiation, self—and other-positioning also play an important role" (Martínez, 2017, p. 236; see also Bamberg & Georgakopoulou, 2008).

4. Storytelling Interventions

This section presents findings from the RWL according to the progress during the iterative research process. In the first phase, mechanisms of in—and excluding different groups of residents were discovered (Section 4.1). This phase led to the design of the storytelling interventions (described in Section 3) to promote inclusive settings for participatory knowledge production. Section 4.2 presents stories that were told and the ways they can be interpreted and contribute to a better understanding of both local frameworks, barriers to participation and potential conclusions.

4.1. "Whoever Is Coming, Is There"

All interviewed planners stressed the importance of participatory planning (a) to get a better understanding of local interests, and (b) to give residents the opportunity to influence democratic decision-making. They emphasized the public character of participation and equal opportunities for everyone to get involved. Although they were aware that only certain groups took part in participatory events, they did not think there was much they could do about it: "Whoever is coming, is there" (#hs_025). For example, most of them realized that language might be an issue for who comes and who stays away. In the same breath, they argued that either they did not have the resources to organize translation services, or that there were too many potential languages, so that providing for some and not for others would again be exclusive. Although this may make sense from an administrative point of view, it discourages residents with poor German language or rhetoric skills from speaking out. As one interlocutor argued:

> To put it casually, who is involved in this? They are white, older men, well-educated and wealthy. This is of course because of the format that is chosen. It takes place in certain public spaces, [for example] the town hall. You have to be very eloquent or articulate to participate, you can't be shy to speak in front of groups, and [should] of course have some experience of participating or speaking. Therefore, logically, this method only appeals to a certain target group. (#cd_003; all direct quotes are translated by the authors)

Many people do not necessarily feel addressed when asked to participate in discussions on urban development:

> Usually there is an event where many people…are invited, then an urban design is presented and you can say a bit about it and comment, right? And of course, that's something that doesn't exactly encourage people, especially in large groups. Only a few people can express their opinion in a large group anyway. (#hs_013)

This became particularly clear in one of the neighbourhoods with a very active self-organized initiative of academics and well-educated citizens who were confident about their position and the validity and importance of their knowledge. Its members took it for granted to have a "right to the neighbourhood," to belong, and to be heard in participatory planning. They were urban planners, architects, landscape architects, and educators, who were used to networking and discussing. Planners reassured the group of its importance and appreciated the work they did at the local level: "They are already doing a lot of the work for us, i.e., in our local partnership. They are an association of very active residents who have a wide variety of ideas for the neighbourhood" (#hs_031). Planners encouraged and valued the group's input because they found it hard to mobilize the local community. Thus, they considered the initiative an important representative of the neighbourhood, which in return confirmed the initiative's self-understanding as a key actor in participatory planning.

However, barriers for others to get involved not only had to do with language issues due to other-than-German mother tongues. Other residential groups were intimidated by the small group of very articulate people who already had expertise in the field of planning and seemed to possess much more relevant knowledge than they themselves did. A local planner confirmed that others might feel overrun:

> They [the members of the initiative] know what they are talking about….They have a completely different attitude from the representatives of the Alzheimer's

> Association, who have more to do with older people, are mainly active in the field of social care and…can easily feel overrun by an architect who rushes ahead and is the spokesperson for the initiative. (#hs_031)

While planners succeeded in encouraging the representative of the Alzheimer's Association to become part of the neighbourhood planning, they found that other groups were much more difficult to reach. The local planner talked about their efforts:

> Unfortunately, we found it very difficult to gain access to some of the religious and cultural communities in the neighbourhood, which is simply because there are no contact details for some of them in the telephone book or anywhere else in the neighbourhood….We tried to contact the Turkish community, for example, and we found someone. We contacted the Greek community and unfortunately, their representative could not take part. (#hs_031)

Not everyone felt invited or competent enough to participate in urban development. People were often not aware of the relevance of their own (everyday) knowledge. Published invitations to participation events did not emphasise enough that it was precisely everyday experiential knowledge that was valuable to the process. Based on these observations and findings, the research project developed storytelling interventions (see Section 3) to design and test potential strategies for more interculture in participatory planning.

4.2. "I'm More the Personal Type''

> My experience with participation is rather mixed…in the sense that this is such a colourful neighbourhood, but participation usually takes place [only] in the German communities….I don't think that migrants are aware of [the opportunity to participate] at all. (#hs_015)

Both types of storytelling interventions aimed to better understand potential barriers to participation, particularly from an intercultural perspective. In the story-corner, storytellers shared the conviction that participation is "for Germans." Their stories and interpretations differed, however. While native German academics involved in participatory planning stated that "others" are simply not interested, without reflecting on their own positionality, resident groups with migration history did not feel addressed and had the impression that participatory planning was not meant for them. Stories about individual experiences with bureaucracy, participation events and different forms of social engagement added up to a more or less consistent narrative. One important topic was the storytellers' potential influence on realising their own needs in the city and/or neighbourhood, e.g., in the field of housing:

> I once went to the mayor with a friend. She had not gotten an apartment she had applied for. She had registered with the housing office, and she had waited so long. She has five children, so there are seven of them in total. There was this four-room apartment and it went constantly back and forth. Then we went there. "Look, I'm tired of this. I've been waiting for years now, been on the waiting list…." Then we talked to the secretary, who was very obliging. She didn't try to block us or pretend that she couldn't do anything. Instead, she said: "Yes, wait a minute." She called and talked to someone, and then told us, "Go home, it'll be fine." After my friend got home, she called me quite happily: "Do you know who just called? I'm getting the apartment after all!" (#hs_016)

Although the successful search for a flat was the central plot of the story, the narrative behind it was the moment of self-efficacy. This experience strengthened the narrator in her experience that personal contact with the administration was a prerequisite for her to have an influence and to see the sense of getting involved at all, which was confirmed in another quote: "I'm more the personal one….I like personal contact [better]. Then I also have a face to the voice." (#hs_016)

The second story came from a storyteller who had originally immigrated to Germany from Syria. He only spoke a little German, and a language mediator helped with the translation of his story. The narrator shared that for financial/tax reasons it does not make sense to register a child's year of birth in Syria if it is born in the second half of the year. Therefore, many Syrians' registered birthday is the 1st of January. In contact with authorities, the storyteller had experienced incomprehension and annoyance on the part of the staff, as the following short example illustrates:

> He tells us of his experience when he was once in hospital and then the doctor asked when the child was born. He said January 1st, and then she put the pen on the table and said: All Syrians are born on January 1st. How is that possible? (#hs_009)

The stories showed that misunderstandings and problems with bureaucracy lead to permanent barriers toward officials, institutions and bureaucracies among immigrants to Germany. However, residents without a migration history of their own also showed suspicions towards administrative decisions, which seemed incomprehensible to them. People felt they had no say in what happened in their neighbourhood since many decisions are not subject to local consultation. One example was a story about a former hostel and homeless shelter, which at the time of the intervention was used as a hostel for newly arrived refugees:

> This [house], which is now the arrival centre for refugees, used to be a district-owned house, a

> homeless shelter. I don't know exactly when it was privatised. Well, in the early 2000s, many municipal housing associations were sold, but also this one. Of course, it needed some renovation, but the homeless people who lived here were quite happy. They had two-bed rooms, it was cheap for them….Many of them had a job, so they lost their flat, but they had a job…they could pay for it….So, then it was rebuilt. First, it was a normal hostel. And now it's an arrival centre for refugees, a rented hostel from the district. So, I mean, that's madness—to give away this house to save the renovation costs….Of course, you can kind of get your doubts about the administration, can't you? (#hs_013)

Her story criticized "the administrative structures" and the storyteller blamed them for their "madness." She addressed the listener as an outsider, to make clear the effects of administrative action on the people in the district. The story was also about highlighting the powerlessness of city dwellers that experienced change but could not intervene. These experiences led to mistrust in participation in general and to seeing the administration as opposition rather than representative of collective action.

In the story-circle, the focus was on the direct co-production of knowledge about the neighbourhood, the communities, local identities, and living together. Participants exchanged their knowledge about the neighbourhood and negotiated positions and power relations. During the story-circle, participants took on different roles: some actively participated as storytellers and shaped the narratives. Others followed the lead and contributed stories about their experiences. One narrative particularly dominated the story-circle and was reflected in many small stories. It was about the conflict between newcomers and long-established residents as an effect of local gentrification.

Right at the beginning of the story-circle, one woman, who positioned herself as an informed and long-term resident, introduced gentrification as a topic: "I think it's still a good mix, not yet too gentrified, but [the district] is changing rapidly and many people have been displaced…in recent times" (#hs_026). This statement made gentrification a central storyline. Participants took up the theme and added their own small stories. It became clear how people define and perceive gentrification ("not that touristy," "new, fancy, modern [flats]," "places that I wish would stay" [#hs_027]). In addition to that, they developed a collective "we"—those who had lived in the district for a long time and perceived the changes, and the "others" who were new to the district and part of the change. The story of one participant will serve as an example:

> They [new residents] expect nothing but the best. The first meeting where many of them came and completely beat a path to the door was when this architect presented the new plan for the supermarket parking lot: "No one told us that they were going to build here! How is that possible? We've just moved in and they're doing construction work here?" We had to show them the ropes: "What have we been living through here for the last few years? Your houses were built here, too!" (#hs_027)

The stories showed conflicts between the long-established residents and the newcomers that might have an impact on participation events and planning processes. The dynamics in the story-circle changed when a woman who self-identified as a newcomer entered the group. She talked less positively about the district than the previous speakers, and told stories about drug addicts and litter in public spaces. The agreed narrative of the conversation confirmed in many small stories had to be renegotiated due to the new participant's positionalities. This was a moment when the collective "we" of the group no longer existed and particularly the person who had opened up the conversation kept quiet. In the context of urban development, this dynamic revealed existing conflicts and different perspectives on topics of urban development.

Since planning is about "wicked problems" (Rittel & Webber, 1973), action depends on problem definition. Listening to stories from residents confronts the (emotional) complexity of neighbourhood dynamics. It is also clear, however, that stories as situated knowledge are never neutral. Storytellers adapted their stories to their counterparts (Norrick, 2010), whom they considered to come from the "outside." Most likely, they would not tell the same stories to a person working in the administration. Thus, while stories revealed how identities and positionalities were co-constructed, it was also necessary to reflect on the blind spots that will always exist. While there will be no consensus on which reading is "right" or "wrong," awareness of these dynamics may make planners more sensitive to the difference in perspectives and positionalities and their relevance to the planning problem, its definition and potential solutions.

5. Reflection on the Co-Production of Knowledge Through Storytelling

Stories are situated knowledge. Storytellers always have their point of view, based on their subjective experiences, and concerning the listener. This leads to the question of the validity of stories and their "truth" (Innes & Booher, 2015, p. 200; Koschorke, 2010, pp. 91–93). Stories can be fictional, and it is difficult to say whether they correspond to facts. More important than the question of "truth," however, is what stories reveal about the storyteller and his or her view of the world. Stories contain experiential knowledge about communities, networks, and social relations. Through storytelling interventions, everyday experiences get recognition as expert knowledge, which empowers people who did not

consider their knowledge relevant. Storytelling is part of the interpretive tradition in planning, which refers to knowledge and action as being recursively linked, rather than the former being a precondition for the latter or preceding the latter in a linear, causal chain (Davoudi, 2015).

If certain residential groups remain absent from participation events, this may be the case because they are simply not interested, as planners sometimes assume. However, storytelling interventions reveal that these formal participation events often are not "open to all," despite the lack of physical or other barriers at first sight. Even though absent residents may not be able to contribute readymade expert knowledge for planners, their stories also raise awareness concerning the one-sidedness of knowledge production if they are not heard and planners only rely on well-informed and well-articulated groups. They show that planners are not "neutral" experts who gather objective knowledge, but that their knowledge is situated within powerful discourses and social relations. When experiential knowledge is recognised by planners and people experience self-efficacy, this can lead to a long-term change in people's participation behaviour. One result can be increased participation in urban development by people who previously did not participate due to various barriers. In addition, planners gather information that is currently not accessible to them. This may actually help to fulfil planners" own expectations and hopes in terms of participatory planning.

However, storytelling cannot—and is not intended to—replace other planning tools (Sandercock, 2003, p. 12) or magically get everyone to participate. Even if storytelling increases the diversity of participants, there is always someone missing. Not everyone enjoys workshops, not everyone is willing or able to tell stories, especially when it comes to an intercultural setting (Taehwan, 2017). Language can be the greatest obstacle if people do not speak the common language equally well or at all. Another obstacle can be the fear of telling a personal story to a stranger. Some people dare to tell a story in public, others prefer face-to-face conversations, writing it down or drawing it. Therefore, other tools such as storytelling salons (Richter & Rohnstock, 2016) or digital interventions (Lambert & Hessler, 2018) like podcasts or photography might be adequate as well. Equally, storytelling does not create ideal speech situations. Even if the settings are designed purposefully to limit hierarchical power relations in the communication, these never disappear. The story-circle can especially be a situation where the academic citizens are still the most dominant. The presented storytelling interventions are not universal tools, and storytelling is not inherently inclusive. It is important to recognize the limitations.

In addition to the variations in narrative skills, it is also important to consider ethical issues: Personal stories can involve trauma. Telling them to strangers requires a high level of trust and respect. As planners usually reach out as outsiders, it is important to create a safe space for sharing stories, e.g., with the help of a trusted person as a facilitator, inform people how the stories are recorded or further used, anonymised, etc. Moreover, storytelling should always be linked to the question of (self-)efficacy and change. Simply telling stories does not necessarily lead to a participatory moment. Thinking about storytelling as a method for place-making (Timmermans et al., 2013) or urban design (Schmidt, 2018) can help planners find a field for using storytelling in participatory practice.

In terms of costs and benefits, storytelling interventions require time and skills to implement and make sense of the large amount of "data" that stories generate, whether audio recordings, written texts or images. There is no easy way, and because of the high level of in-person interaction, stories may contain information that is far from what planners consider relevant. Moreover, the question arises whether listening and working with everyday stories are still part of planning tasks and to what extent planners (are supposed to) have these competencies. Although cooperation with other professions such as architecture, social work or local studies will be useful, we nonetheless argue that stories provide planners with a sense of situated knowledge and that this embodied and personal experience is an essential prerequisite for planning as a practice of knowing.

6. Conclusions and Perspectives

Attention to situated knowledge in storytelling interventions reveals multiple perspectives on a neighbourhood. Beyond identity definitions along categories such as age, gender, or migration background, storytellers identify as Christians, foreigners, mothers or grandfathers, etc. Through stories, people reveal places where they go and feel safe, but also the circumstances in which they feel empowered to participate. Knowing people's different understandings of participation and gaining insight into their different social activities allows conclusions about participation (barriers, approach, issues). Therefore, thinking in terms of processes, stories can be important for gaining insight into engaging people at further stages. Particularly concerning the role of emotions and their effects in planning, e.g., in the context of planning conflicts, we imagine that storytelling might also be a promising approach to develop planners" professional reflection on positionality further and to promote a better understanding of potential conflict sources and solutions.

Nevertheless, this research was the first step. During the research, many ideas came up to think about storytelling in the participatory planning context further, particularly in terms of cross-media use linking online and offline methods: publishing stories in public space (via QR codes or other digital interfaces), establishing neighbourhood-based story-mapping, or stories in audio-guides that address different life-worlds and make positionalities of storytellers visible. In the end, this multi-modality and variety of methods may actually

help to address more urban residents and stakeholders through participatory planning, and to extend planning as the practice of knowledge and knowledge production beyond professionals with academic backgrounds.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Sharing and Space-Commoning Knowledge Through Urban Living Labs Across Different European Cities

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Abstract
While the growing commodification of housing and public spaces in European cities is producing urban inequalities affecting mostly migrant and vulnerable populations, there are also manifold small-scale neighbourhood-based collaborative processes that seek to co-produce shared urban resources and contribute to more resilient urban developments. As part of the ProSHARE research project that investigates conditions in which *sharing* takes place and can be expanded to less-represented populations, we focus here on sharing and space-commoning practices within urban living labs. Considered multi-stakeholders sites for innovation, testing, and learning with a strong urban transformative potential, urban living labs have received increasing academic attention in recent years. However, questions related to whether and how labs facilitate processes of exchange and negotiation of knowledge claims and generate spatial knowledge remain largely unexplored. We address this gap by looking at the role urban living labs play in the regeneration of neighbourhoods, asking how sharing and space-commoning practices generate situated spatial knowledge(s) that can be used in planning processes, and what type of settings and methods can facilitate such processes. These questions are addressed in the context of four ProSHARE-Labs located in Berlin, Paris (Bagneux), London, and Vienna, drawing on a cross-case analysis of the functioning of these hubs, the research methods applied in each context, and on the translocal learning and possibilities for upscaling resulting from these parallel experiences.

Keywords
heterogeneous neighbourhoods; ProSHARE; R-Urban; situated knowledges; spatial knowledge; translocal learning; urban commons; urban living lab

Issue
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1. Introduction

While urban living labs (ULLs) have received increasing attention as sites of innovation, testing, and learning (e.g., Kronsell & Mukhtar-Landgren, 2018; Marvin et al., 2018; Rizzo et al., 2021), questions related to whether and how they facilitate processes of exchange, negotiation, and co-creation of spatial knowledge between the participating stakeholders remain largely unexplored. To address these questions, we conceptualise "spatial knowledge" through the lens of "sharing" and "space-commoning," that is, knowledge about a specific space

produced through its situated experiences within existing sharing practices and space-commoning initiatives, which constitute expressions of solidarity and care at the neighbourhood level. Drawing on this, the aim of this article is to examine the potential of different forms of ULLs as innovative and cooperative processes in planning. In particular, we explore to what extent labs contribute to the co-production and implementation of situated sharing and space-commoning knowledge, thereby fostering learning processes at the neighbourhood level and beyond. For evidence, we turn to ULLs in four European cities—Berlin, Paris (Bagneux), London, and Vienna—developed within the framework of the ProSHARE research project that explores the potential of sharing in housing and public space to reduce space competition and enhance inclusion and social cohesion in heterogeneous neighbourhoods. Four ProSHARE-Labs have been developed to support existing sharing practices that put in common spatial resources (e.g., public spaces, ground floor zones, parking spaces) and expand these to less represented groups (e.g., residents from different immigrant backgrounds and generations). Through a cross-case analysis of these labs, the article evaluates the potential of ULLs as a methodology to (a) foster exchange and negotiation between different stocks of spatial knowledge, and (b) generate, transfer, and upscale situated knowledge(s) that can be actionable in planning processes.

2. The Relevance of Sharing and Space-Commoning Knowledge Practices in Planning

2.1. Learning in Planning: Negotiating Multiple Spatial Knowledges

Planning is confronted with a variety of past experiences, future expectations, interests, forms of knowledge, actors, and institutions. Given the growing complexity, "learning in spatial planning" has become a rather difficult endeavour (van Assche et al., 2020). We understand learning in this context as the creation, integration, negotiation, validation, and use of different forms of knowledge that leads to socio-spatial change and results in the transformation of institutional arrangements. Although the literature distinguishes between policy and social learning (e.g., Holden, 2008; Natarajan, 2017)—the former referring to the introduction and accumulation of new planning instruments, skills, and modes of governance; the latter more concerned with a change of attitudes, beliefs, goals, and normative perspectives (Zimmermann, 2009)—they both share an emphasis on the continuous collective generation and deployment of knowledge as a fundamental source in urban transformations. They also entail the identification of an ever-growing variety of relevant stocks and sources of knowledge underlying learning in planning processes.

While the "spatial turn" in social sciences led to the recognition of space as social and relational (Lefebvre, 1991; Soja, 1989), in the field of planning this implied that conceptualisations of spatial knowledge abandoned the previous positivist approach. With the shift into post-modernist planning theory and the so-called "communicative turn in planning" (Healey, 1992), spatial knowledge ceased to be conceptualised as factual, technocratic, and objective, and became increasingly recognised as multiple, diverse, processual, and relational (Rydin, 2007). This implied acknowledging that diverse forms of knowledge are generated in social networks that go beyond traditional "epistemic communities" (Haas, 1992) or planning policy actors (Healey, 2007).

Different conceptualisations of spatial knowledge exist across disciplines and could hardly be subsumed under a common framework. Still, one could agree spatial knowledge is broadly defined as different ways of *understanding space*. Moving beyond technical perspectives on spatial knowledge (as geo-coded or geo-referenced data), Pfeffer et al. (2013, p. 259) define it as a "holistic and perceived spatial 'comprehension' of facts, interdependencies, connections, and dynamics that can be mapped, either individually conceived or shared by a group." Along these lines, mapping has surfaced in recent literature as providing a particular form of spatial knowledge (Dovey et al., 2018), with digital mapping tools thereby serving as a form of participatory spatial knowledge production and management making visible and integrating different forms of knowledge via open digital platforms (Pfeffer et al., 2013). Other conceptualisations of spatial knowledge emphasise its social, subjective, and experiential nature by referring to the "subjective or individual experiences and perceptions of space, imaginations, emotions and affective reactions" (Löw & Knoblauch, 2019, p. 11; Million et al., 2022).

Additionally, the understanding of spatial knowledge draws on research on the contextual and heterogeneous nature of knowledge stocks. The notion of "knowledge orders" (Wehling, 2004, in Zimmermann, 2009, p. 59) for instance, allows distinctions between socio-cultural and temporarily accepted hierarchies of categories of knowledge such as *objective* knowledge versus *subjective* beliefs, or *science-based* expertise versus *lay* knowledge. Rydin (2007) proposes other forms of distinction between "types of knowledge claims": (a) *empirical* or *experiential* (based on the current state of a situation or the outcomes of a planned action), (b) *processual* (based on the understanding of the dynamics underlying urban transformations), (c) *predictive* (expected developments and trends), and (d) *normative* (as visions of desired outputs). A more widespread categorisation of spatial knowledge remains in the distinction between *expert*, *sectoral*, *community*, and *tacit* knowledge (Pfeffer et al., 2013).

Despite new institutional arrangements and forms of governance that have increasingly shifted the focus towards participation and co-production approaches for integrating different stocks of knowledge (Natarajan, 2017), we still identify *expert* and *sectoral knowledge* as prevalent in spatial planning (Pfeffer et al., 2013).

These forms of spatial knowledge stem mainly from accepted expertise gained via professional education and organisations (and might include other knowledge stocks such as political, institutional and management knowledge). Forms of *tacit knowledge* (i.e., knowledge of individuals with experience such as experts, communities, and citizens, grounded within practice but not explicitly articulated), as well as *community knowledge* such as that of urban initiatives (i.e., knowledge that is context-embedded, community-based, and generated and spread within networks and associational governance forms) often remain fragmented, disregarded, or disconnected from planning processes (de Sousa Santos, 2004).

While Rydin (2007, p. 58) already advocated years back for creating spaces in planning that recognise, test, and validate different knowledge claims, we still know very little about what kind of new institutional arrangements and modes of governance can effectively support collaborative practices of knowledge co-production. Here we argue that ULLs, considered not only as a planning and policy instrument but also as a research methodology, constitute an opportunity for exploring multi-stakeholders processes of exchange, negotiation, and co-creation of spatial knowledge. We argue, therefore, that some forms of ULLs have the potential to operate as "hybrid forums for agonistic collective learning" (Rip, 2003) in which—in line with Habermas's (2002) theory of communicative action—the creation of new knowledge and testing of alternatives emerge out of the confrontation and combination of different ideas (van Assche et al., 2020) and diverse types of knowledge claims (Rydin, 2007).

2.2. Sharing and Space-Commoning Knowledge Practices

Among the diverse stocks of knowledge that constitute spatial knowledge we deem of particular importance *lay* and *community knowledge* of urban initiatives—citizens' groups leading innovative and community-based actions pursuing transformative goals in urban contexts. The former, lay knowledge, comprises a situated and contextual knowledge of space, based on subjective spatial experiences shaped by categories such as age, gender, ethnicity, or socio-economic status (Ulloa et al., 2022). The latter, community knowledge, is as Casas-Cortés et al. (2008, pp. 42–43) put it within the larger framework of social movements' knowledge literature (e.g., Cox, 2014; Della Porta & Pavan, 2017), "embedded in and embodied through lived, place-based experiences, [and is thus able to] offer different kinds of answers than [other] more abstract [forms of] knowledge." In practice, however, residents' and urban initiatives' "situated knowledge(s)" (Haraway, 1988) are rarely put at the forefront of spatial planning processes.

For this reason, we set the focus on this specific form of spatial knowledge, that is the *situated* spatial knowledge(s) of residents and urban initiatives and their networks, and, in particular, those that specifically deal with *sharing* and *space-commoning practices* as a way of subverting the growing space competition and commodification of public and residential spaces. Within recent debates on the *sharing economy* (Rutkowska-Gurak & Adamska, 2019; Vith et al., 2019) and *urban commoning* (e.g., Feinberg et al., 2021; Petrescu et al., 2021; Stavrides, 2015), we position ourselves along those who recognise the growing importance of sharing and commoning as practices of resistance against market-dominated urban development processes, acknowledging, however, the inherent exclusions in commoning processes too and the ambivalences and plurality of conceptual sensibilities of these notions (Enright & Rossi, 2018). In this context, we refer to "sharing" and "space-commoning" as more or less institutionalised collaborative practices through which spatial resources and knowledge of space are co-produced, exchanged, and enacted without being commodified. Examples across the world include, among others, practices developed in community gardens, community kitchens, cooperative housing, neighbourhood workshops, and urban commons of all sorts.

Consequently, and drawing on Della Porta and Pavan's (2017, p. 6) notion of "repertoires of movements knowledge practices," we refer to *sharing and space-commoning knowledge practices* as the ways by which individual, situated, and subjective experiences, rationalities, and affects related to space are brought together and organised under a shared cognitive framework that gives individuals within a sharing community, civic collaboration units, or larger actors and institutions (con-)figurations a common direction for acting collectively to produce shared spatial resources. In this context, we address the questions of what stocks of knowledge are produced through sharing and space-commoning practices and how these are co-produced, negotiated, exchanged, and implemented within communities of sharing and through larger multi-stakeholder collaborations.

As sharing and space-commoning knowledge practices are enacted by civic collaborations (Foster & Iaione, 2015) mostly including participants from local communities, practitioners, academic, and local non-profit organisations, they often necessitate complex forms of urban governance that include public and private actors (Iaione & Cannavò, 2015). These collaborative configurations do not necessarily have the same motivations and goals and the spatial knowledge they produce is not homogenous and equally distributed but rather diverse, contrasting, and often conflicting. Diversity and disagreement of knowledge claims, however, can constitute a productive tension in planning processes, a "trading zone" (Rizzo et al., 2021) required for the negotiation of differences in order to reach compromises for the co-production of spatial knowledge. The question remains as to what extent and in which forms ULLs can become this productive "liminal space of contention" (Cermeño et al., 2022) and negotiation.

3. Unravelling the Notion of Urban Living Labs

3.1. Urban Living Labs as a Policy and Planning Instrument

For at least a decade, institutionalised forms of ULLs have proliferated across Europe as policy and planning instruments bringing together different actors from civil society and the public and private sectors to co-create knowledge and test innovations. ULLs add up to the different experiences and local experimental projects of a participatory nature, working at different scales and levels of institutionalisation around the world, that function as laboratories for co-production of space and knowledge (e.g., community training centres, cultural centres, participatory platforms, or grassroots planning networks).

Drawing on the growing ULL literature (e.g., Aquilué et al., 2021; Bulkeley et al., 2019; Scholl et al., 2022; Scholl & Kemp, 2016; von Wirth et al., 2020), JPI Urban Europe (2022) currently posits four main characteristics of labs: (a) they facilitate inclusion and engagement of different stakeholders, (b) they respond to local challenges and contribute to capacity-building, (c) they implement flexible innovation methods and integrate feedback and learning, and (d) they situate knowledge where the problematic to be addressed takes place, often on the neighbourhood scale. The focus on situatedness is key in ULLs. As Karvonen and van Heur (2014, p. 386) point out, ULLs are grounded in locally specific conditions and dynamics to produce "legitimate knowledge" within the urban laboratories as a "legitimising space." More recent works, however, point to the need for de-/re-contextualising and upscaling the generated knowledge to allow "transurban learning processes" across labs and different urban contexts (Scholl et al., 2022).

Common to most ULLs is also the idea that innovations need to be co-produced by and create value for all involved participants and users (Puerari et al., 2018). On co-production processes, the literature agrees that labs are contingent on the ability of participants to ensure openness by establishing trustful relationships and facilitating participant reflections, open dialogues, and feedback. The innovation's value, however, remains often contested among stakeholders (Petrescu et al., 2021).

Finally, concerning the researchers' preconceptions of the outcomes and the anticipation of the learnings developed through ULLs, we consider that the often-prevailing top-down organisational set-up of ULLs and the participants' role in the co-creation processes need further inquiry. To avoid the top-down nature of some forms of ULL, the ProSHARE-Labs have adopted a participatory action research approach (Soeiro, 2021).

3.2. Urban Living Labs as a Participatory Action Research Methodology in the Context of ProSHARE

The cases explored in the article present different forms of labs and urban contexts (Figures 1 and 2). In Berlin, the lab is located in a traditionally politicised central district which faces gentrification. In Paris and London, they take place in the context of two social housing estates, while in Vienna, the lab is situated in a dense (central) neighbourhood whose housing stock remains affordable to young families and new migrants. This variety allows a cross-case evaluation of the labs' potentials and limitations as multi-stakeholders hubs for (trans-)local spatial knowledge co-creation, negotiation, and exchange. Since the cases are part of a still ongoing project, we can only assess the labs on the basis of the workshops conducted over a period of 10 months (see Figure 3) and draw tentative conclusions on the processes that are not yet finalised.

In order to ensure the possibility of a translocal comparison, transferability, and upscaling (Scholl et al., 2022), the labs are framed under the same methodological strategy based on action research and a user-centred participatory design approach (Dell'Era & Landoni, 2014) to produce sites of situated spatial knowledge(s) co-creation and experimentation (Figure 4). This way, the labs combine in their collaborative practices three *intertwined* dimensions: (a) *co-designing*, (b) *prototyping*, and (c) *self-assessment*, to reflect on the co-creation, integration, negotiation, validation, and use of the produced knowledge. These dimensions can be investigated by looking at five analytical criteria: (a) the specific *focus* of each ULL (as per the context requirements), (b) the forms of *sharing and space-commoning practices* (e.g., what is shared, places, and modes of sharing), (c) the *level of institutionalisation and stakeholders (con-)figurations* (e.g., sharing networks), (d) the *co-production approaches* (for co-creating, integrating, and negotiating diverse knowledge stocks), and (e) the *impacts* of the produced spatial knowledge (i.e., validation, use, and assessment of its transferability and transformative potential).

Through workshops for *self-assessment*, *co-designing*, and *prototyping* (e.g., ranging from temporary built elements, digital spaces for collaboration, or new stakeholders' networks), labs are mobilised to achieve three main goals: (a) to foster the co-creation (and critical evaluation of) a specific form of spatial knowledge, that is *sharing and space-commoning knowledge*, i.e., knowledge about specific spaces produced through situated experiences within sharing and space-commoning initiatives; (b) to support existing (and test news forms of) sharing practices in the neighbourhood(s) that put in common spatial resources; and (c) to facilitate the improvement and expansion of these towards far less represented groups.

To avoid the pitfalls and shortcomings of top-down approaches to ULLs, the labs are nested in existing local initiatives. This ensures the situatedness of the spatial knowledge generated and enhances the prospects of continuity beyond the research project. Given the contextual grounding of each lab, the participatory methodologies inevitably vary across the cases as they are contingent on the specific stakeholders' collaborations and users' requirements.

Figure 1. Locations of the Berlin and Paris (Bagneux) ProSHARE-Labs.

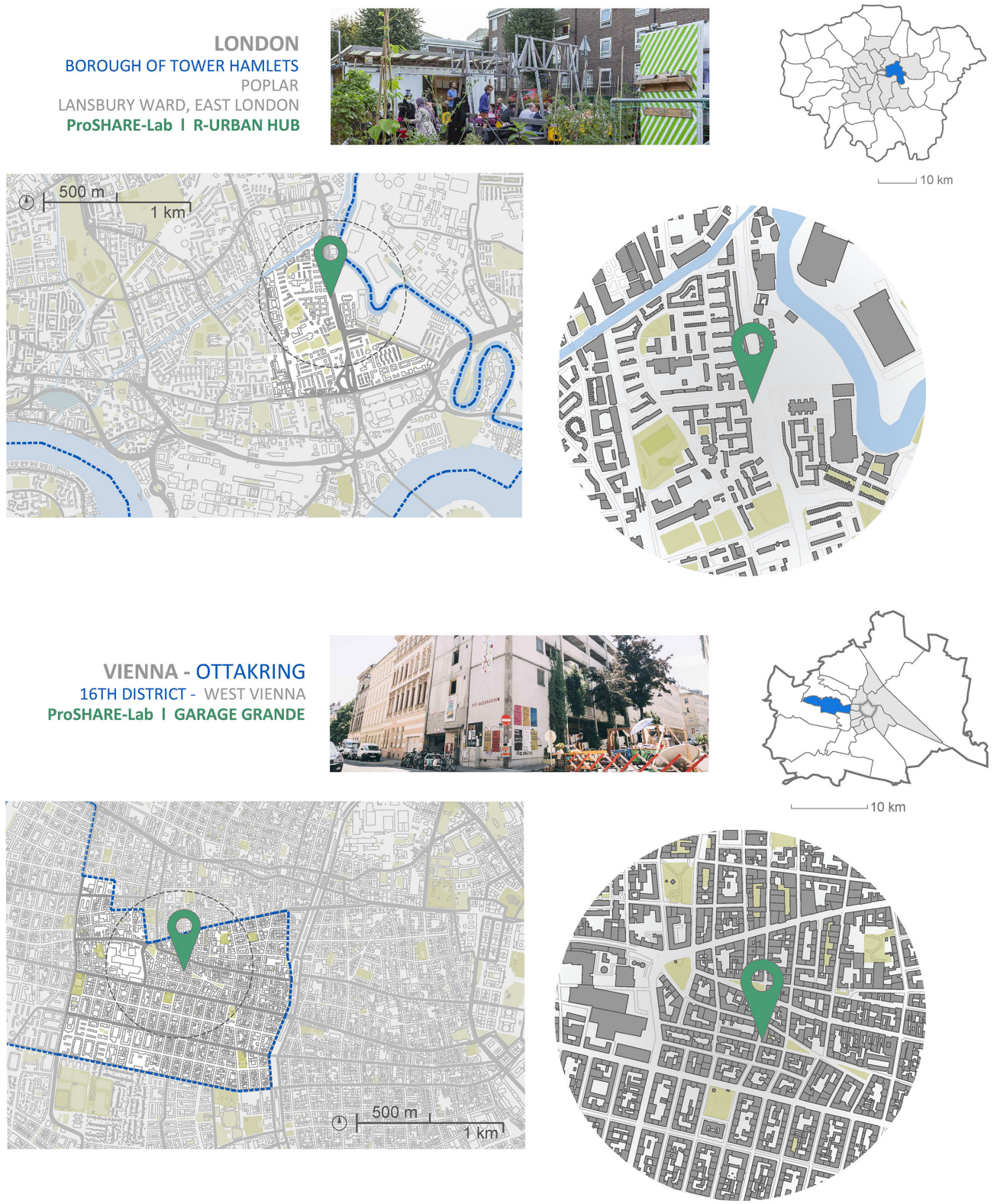

Figure 2. Locations of the London and Vienna ProSHARE-Labs.

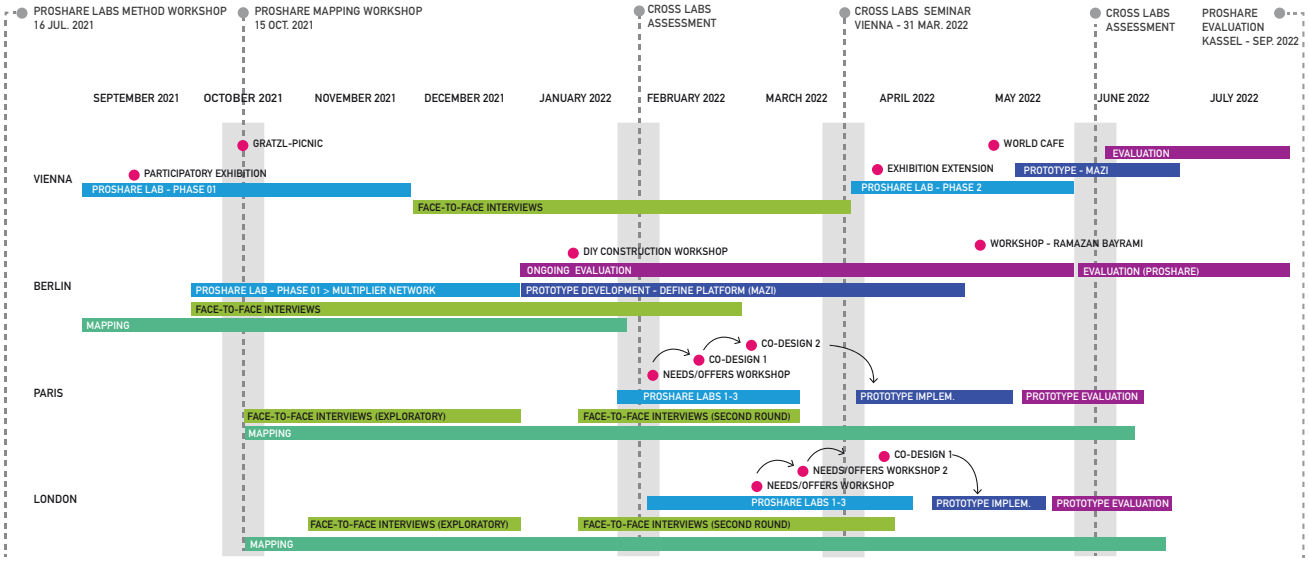

Figure 3. Methodological timeline of the ProSHARE-Labs.

Despite contextual differences, all labs drew on three main research methods applied as part of the shared methodological strategy (Figure 4): (a) *qualitative interviews and groups discussions with relevant stakeholders*, to better understand sharing processes and issues at stake within specific areas of influence; (b) participatory *mapping* to draw situated inventories of existing resources and actors in order to foster new synergies and collaborations; and (c) a *quantitative survey* (ongoing) to generate transnational knowledge about existing forms of and conditions for sharing and space-commoning practices at the neighbourhood level (including paper/pen data collection facilitated through the labs to reach less represented groups). This research methodology applied consistently across the four case studies enables comparative analysis and joint learning across the labs (Scholl et al., 2022). Among these methods, mapping is of particular relevance in all labs. It completes more traditional qualitative research methods by providing a powerful way to aggregate knowledge from different sources (Dovey et al., 2018). It produces spatial knowledge by making visible the types of spaces required for sharing at the neighbourhood level, the social and institutional networks that support sharing and their relation to space, their scope and reach at local, national, and international scales, and provides an accessible way of sharing knowledge among local communities. The specificity of how the overall methodology and selected methods are applied to produce situated spatial knowledge(s) in the context of each lab will be discussed in the empirical section.

4. Exploration of ProSHARE-Labs Across Four European Cities

4.1. Berlin ProSHARE-Lab: Mobilising Sharing and Space-Commoning in an Increasingly Gentrified Neighbourhood

The Berlin lab is located in the Friedrichshain-Kreuzberg district, in the Wrangelkiez and Reichenberger Kiez inner-city neighbourhoods characterised by high building densities and multi-storey Wilhelmine residential buildings with retail and offices on the ground floor. In the 1990s, both neighbourhoods were known for their alternative, left-wing, and working-class residents and their high percentage of Turkish migrant population. Since the 2000s, gentrification processes have increased, caused by growing real estate and rental values. Currently, various initiatives are fighting to protect non-commercial spaces and rent limitations.

Lab activities are interconnected with the transdisciplinary StadtTeilen research network of Germany-based academics, social workers, architects, and planning practitioners. From September 2021 to June 2022, the ULL has developed actions to gain community and tacit knowledge on existing sharing practices in public spaces—i.e., on the subjective experiences of inhabitants about sharing and space-commoning places—and to reflect on the ways in which existing and new (non-commercial) forms of space-sharing could be supported and expanded.

The Berlin lab builds on previous spatial analyses as well as expert and sectoral knowledge gained from interviews with local politicians, representatives from civil society organizations, and housing companies. In the initial phase, participants explored and mapped spaces that constitute locations for sharing in the neighbourhood via a web-based open-source digital

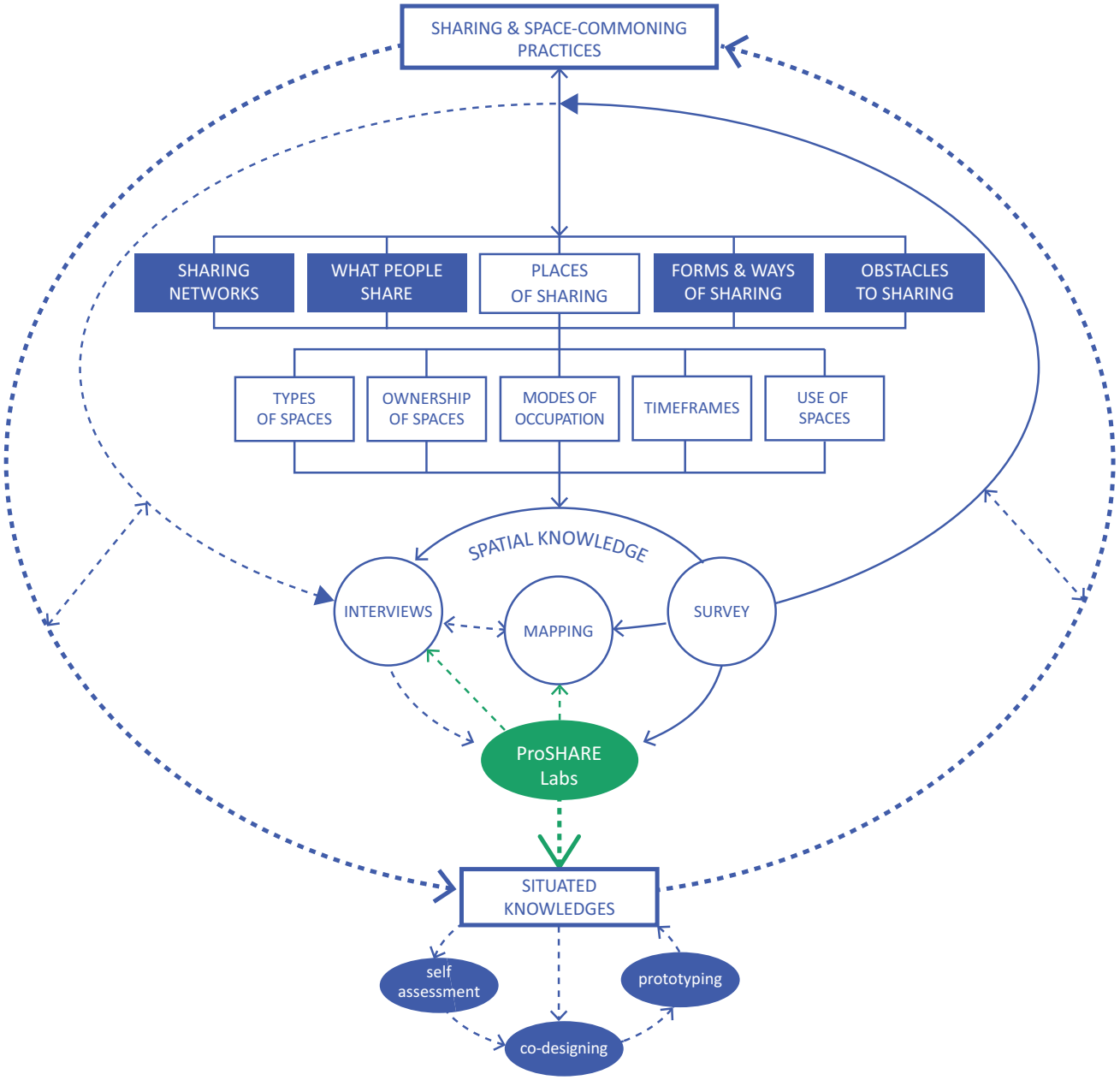

Figure 4. Methodological strategy of ProSHARE-Labs. Graphic design by Carola Moujan.

mapping tool developed by the NGO Adhocracy/Liquid Democracy. Later, this was supplemented via analogue formats (Figure 5)—for example, residents could flag places they experience as important for sharing such as park benches, playgrounds, or sidewalks, and/or comment on existing entries. This constituted a platform-based co-production process that generated tacit and community knowledge on the individual perceptions of space-related sharing practices in the neighbourhoods. Temporary installations also included an exhibition of successful urban sharing practices and artistic visualisations of desired sharing spaces expressed by participants, expanded later with a digital users' *sharing wish list*.

The self-assessment of the generated knowledge served as a basis for designing and later prototyping (a) architectural interventions in public space that could potentially create new forms of neighbourhood space-sharing practices and (b) a digital space for sharing information, using MAZI, a toolkit for developing local intranets and facilitate digital collaborative processes and DIY networking. At this stage, the lab had integrated among its participants a group of 10 residents cooperating with the local protestant church. Lab participants reflected on and co-designed potential transformations of the public space in front of the church to increase its accessibility and architectural qualities as a *shared space*. Part of the design included herb beds which were prototyped and developed in collaborative construction workshops. These brought together citizens and diverse professionals (e.g., architects, sociologists, urban planners)

combining situated processual knowledge at the intersection between expert and community knowledge.

The community centre Kiezanker 36 played a pivotal role in networking and multiplying the lab's impact, connecting its activities with local initiatives. While the lab did not seek to reach a representative cross-section of the neighbourhood's population, it focused on including a mix of different age groups of newly arrived and long-term residents as well as neighbours from different immigrant backgrounds. Among the participants, there were representatives from local initiatives and civil society organisations (e.g., a citizen initiative promoting a car-free neighbourhood or a community garden group). There was less involvement however of groups not dealing directly with urban development issues. Along with the ongoing evaluation and assessment of previous lab activities, subsequent actions seek currently to (a) involve less represented groups via face-to-face interviews with refugees and homeless and elderly people to better understand how to further expand sharing practices and (b) activate the local MAZI intranet among a citizens group active in the lab.

Preliminary lab results show an important number of existing spaces in which sharing already takes place. These are mainly non-commercial places such as meeting rooms for the elderly, playgrounds, and locations in which migrant communities meet up. Also places where people share goods such as clothes, books, or domestic appliances. While some of those places have emerged with institutional support (e.g., public playgrounds), other spaces of sharing emerge more spontaneously through the everyday practices of inhabitants. These everyday experiences constitute a stock of situated spatial knowledge(s) of sharing space that, in neighbourhoods facing gentrification, can potentially inform and influence planners and public authorities in their decision-making.

4.2. Paris (Bagneux) ProSHARE-Lab: Inventorying, Enhancing, and Expanding Sharing Practices

The Paris ProSHARE-Lab is located in Bagneux, a town of 40,000 inhabitants in the Parisian suburbs, historically a wine production area, later known also for its market gardening and development of stone quarries. In the early 1900s, the town joined the Red Belt, a group of settlements inhabited by factory workers expelled from the city centre. Since 1935, Bagneux has been run by a left-wing coalition led by the Communist party, an administration that has continuously supported community-oriented initiatives and developed ambitious social housing programs. Even today, the area has one of the

Figure 5. Digital and analogue co-mapping in the Berlin lab.

highest social housing rates in the region. Despite gentrification processes underway in many Parisian suburbs, the town remains largely working-class and cosmopolitan, with employees and factory workers accounting for nearly 38% of the active population and 45% of residents coming from an immigrant background (Atelier Parisien d'Urbanisme, 2021). The lab in this case is nested within Agrocité, a community-built and self-governed eco-civic hub and urban agriculture site founded in 2016, where many sharing activities are organised weekly. Agrocité is part of R-Urban, a participative strategy and network of civic resilience initiated by the architectural practice Atelier d'Architecture Autogérée in 2008 (R-Urban, n.d.).

Agrocité is situated close to Cité des Tertres and Cité des Cuverons, two large social housing estates (*grands ensembles*) typical of the 1960s and 1970s urbanism, recently renovated within the framework of Plan National d'Urbanisme. In spite of their vicinity, residents of the *cités* have not joined Agrocité. One of the goals of the lab is to identify potential reasons for this lack of involvement as well as to devise strategies to overcome the gap. More generally, the lab sought to evaluate what Agrocité has to offer as a sharing infrastructure, tackle spatial and social pitfalls that prevent the development of emerging sharing processes, and identify ways to expand its sharing potential beyond its current limits.

Methods deployed included qualitative interviews, ethnographic observation, mapping, co-designing, and prototyping. Mapping was used as a way to generate spatial knowledge by collecting and analysing information gathered through observations and interviews. It also served as the basis for participatory workshops where participants corrected and expanded the information gathered by researchers based on their own subjective and individual experiences.

Workshops conducted in the lab (see Figures 6 and 7) sought to (a) create an inventory of available resources and foster collaboration between local initiatives (as co-production of empirical knowledge), (b) to enhance existing sharing practices within the hub (as activation of community and processual knowledge), and (c) to expand the group's capacity to include new members and develop wider sharing (as a normative vision based on the notions of inclusion, conviviality, and diversity).

The first workshop consisted of participatory mapping utilising GoGoCarto (an open-source digital cartography tool) with 15 participants from six local organisations in Bagneux, focusing on their relations of sharing, in order to identify and rank needs and resources. These mapping activities revealed two seemingly contradictory facts: continuous financial support from the local administration had boosted sharing activities organised by local organisations in the neighbourhood. Yet, there seemed to be only a few joint actions and very little space sharing despite their overlapping goals. Moreover, the proliferation of institutionalised sharing places seems to have absorbed spontaneous and tactical spaces where sharing happens informally and outside any organised structure. Insights hint at structural causes for this, particularly that public funding is granted to initiatives targeting specific areas with a high number of low-income residents. This leads to competition between actors over available spatial resources in strategic locations (such as the *cités*) and over visibility and social recognition. Another important factor seems related to the involvement of elected officials as volunteers in local associations—an overlapping of social and political networks that appears to have a strong influence on strategies and internal governance of sharing hubs. These preliminary findings highlight the need for further collaboration and mutual support

Figure 6. Self-assessment workshop at the R-Urban Agrocité hub in Paris (Bagneux).

across organisations (rather than competition), in order to address key issues (ecological literacy, civic education, and urban exclusion due to gentrification) and scale their actions strategically to include key publics (youth and women from diverse backgrounds and low-income residents), but also to encourage spontaneity and to highlight the role the Agrocité hub could play in this.

In a second workshop participants recognised multiple links between offers of sharing and the needs of local organisations which led to identifying and co-designing collaborative project ideas. In a third workshop, three projects were prototyped in terms of initiation, preparation, and realisation, among which two are currently being implemented and require future assessment (i.e., Building Together the Belvédère Garden, involving local youth, and European Capital of Civic Ecology, to make visible, activate, and upscale the civic ecology actions in the city).

Figure 7. Collaborative digital map and co-designing workshop at the lab in Paris (Bagneux).

4.3. London ProSHARE-Lab: Spatial Clustering of Sharing Practices and Neighbourhood Regeneration Processes

The London ProSHARE-Lab is located within the district of Poplar in the borough of Tower Hamlets, East London, within the Lansbury Ward, an administrative neighbourhood with about 15,000 inhabitants. Poplar sits to the north of Canary Wharf and has a long history dating back to the 18th century in providing housing for London Dock workers and the working class. More recently, Tower Hamlets and Poplar have become centres of the Bengali diaspora in Britain, housing the vast majority of first, second, and third generation families who emigrated since the 1970s. In the Lansbury Ward, the Bengali community accounts for 39% of the ethnic mix, one of the highest in the country. Poplar has a high density of social housing with 57.5% of housing tenure being social rent (London Borough of Tower Hamlets, 2014), the majority of which is administered by the Poplar Housing and Regeneration Community Association (HARCA), a social landlord and charity, set up in the 1990s during the shift of housing provision from local government to housing associations.

The ULL is situated within one of the R-Urban eco-civic hubs on the Teviot Housing Estate, the R-Urban Poplar hub which occupies a temporary use site on a short-term lease. The hub was initiated by Public Works, an art and architecture collective, in partnership with Poplar HARCA. Over a period of four years, this project has transformed a vacant carpark and garages into a thriving community hub, with a focus on environmental education, urban agriculture, and building local resilience through participation in the built environment. Drawing on the shared mutual interest and normative knowledge of commons-based civic resilience, the hub has built a strong network of local stakeholders alongside a wider community of practice.

In the context of the Teviot estate undergoing regeneration processes to increase the housing stock and provide new amenities and services, the objective of the lab is threefold: (a) to generate spatial knowledge of the existing socio-spatial dynamics in relation to the current and predicted state of housing and in particular to understand the existing situation of spaces of sharing, by focusing specifically on the role of community and non-governmental organisations; (b) to focus inwardly on the R-Urban Poplar Hub as an existing space of sharing and to engage local stakeholders in mapping the barriers to sharing for the hub; and (c) to take the learnings from the lab forward as a projection for the future estate, understanding the role of situated community knowledge(s) in the wider regeneration context and how to encourage diverse practices of sharing in its future planning.

The lab has developed three main participatory workshops (Figure 8). The first brought together local experts identified through initial interviews and used relational mapping to generate knowledge on the connections between organisations along thematic lines. Mapping processes highlighted the clustering of informal civic groups, associations, and organisations who engage in sharing at key community nodes, often sharing one facility between multiple actors. The area is fairly unique in the proliferation of hyper-localised community centres on each of the HARCA-managed estates and reflects the strategic role of Poplar HARCA as a powerful and influential actor in the planning and regeneration of the neighbourhood.

The second lab workshop brought together 12 participants from 10 local community organisations in Poplar in a reflective co-production session to identify current barriers to sharing in the neighbourhood. Participants included Bengali food growers alongside

Figure 8. Mapping and co-designing workshops at the R-Urban hub in Poplar.

other professional enterprises, with the aim of developing new governance models for sharing physical resources. The joint session allowed the participants to create new links/relationships and a shared interest in sustaining this new network, and multiple links between offers of sharing (objects, spaces, and experiences) with organisation needs (e.g., sharing of timber/tools between R-Urban and Burcham Street Gardeners/ Poplar Union).

The third workshop served as "trading zone" by bringing together participants from the first two actions alongside important strategic stakeholders within local authority planning and housing association development teams to better understand how the emerging community-based learnings could inform the normative vision of the future masterplan of the Poplar area. The workshop allowed participants to identify and prototype three potential collaborative projects i.e., (a) Sharing Solidarity Network; (b) Tool-Resource Sharing; and (c) Green Network and Skill Sharing, for collaborations across multiple sites in Poplar.

4.4. Vienna ProSHARE-Lab: Supporting Networking and Expanding Sharing Practices at the Garage Grande

The 16th district of Ottakring is one of Vienna's most rapidly growing areas. It is characterised by stark contrasts between the low-density middle-class residential neighbourhoods on the west and the eastern working-class area with higher population density, larger proportion of immigrant residents, and a comparatively high unemployment rate. Most buildings were constructed before 1919, during the Gründerzeit and are privately owned. Still, the inner part of the district functions as an entry point for migrants and young families because its historical housing stock remains more accessible than public housing.

The Vienna lab has been anchored in the Garage Grande, a temporary use project (2020–2023) developed by the Gebietsbetreuung Stadterneuerung (GB*West), a municipal urban regeneration agency (Figure 9). Located in the middle of the dense, inner section of Ottakring district, Garage Grande has been established in a former multi-storey car-park space, a building facilitated by the property owner (to be later transformed into private housing). The place currently serves as an open space for knowledge exchange and experimentation for different citizen-led DIY initiatives, free of rental costs, and subject to fewer institutional and administrative requirements. This way, it gives visibility to different forms of tacit knowledge of individuals and citizen groups with experience in topics pertaining to circular economy and community building at the neighbourhood level.

Within Garage Grande, the Vienna ProSHARE-Lab constitutes a one-year interface-platform for learning about practices of sharing and forms of self-organisation

Figure 9. Space of the Vienna ProSHARE-Lab within Garage Grande. Source: Courtesy of Tim Dornhaus.

set by a research team in collaboration with the GB*West. It seeks thereby to include plural voices among Garage Grande stakeholders by providing spaces for dialogue, and, in particular, to address underrepresented groups. This is done by reaching out and creating relationships of trust with local initiatives that enable access to marginal communities.

The lab activities are structured in two phases. In the first one, it has secured a physical space for interaction and exchange in which open dialogues on sharing practices have been facilitated by researchers to assemble residents' and urban initiatives' experiential knowledge(s). This was preceded by expert interviews that allowed identifying relevant actors related to existing sharing initiatives in the neighbourhood. In order to collaboratively generate knowledge on sharing and space-commoning, discussions were combined with other participatory methods. Among these, the lab included group discussions, a participatory exhibition and mapping workshops (Figure 10), that allowed rendering tacit knowledge of local sharing projects and initiatives visible and to foster networking and knowledge exchange among the diverse participants. The exhibition, for instance, invited participants to add and discuss through a pinboard intervention information on spaces of sharing, involved actors, shared resources, and their spatial distribution. With a low-threshold approach to reaching out to different population groups, the (ongoing) exhibition functions also as a platform for disseminating the research results to the general public.

The second and current phase seeks to deepen the discussion on (a) sharing practices, their framework, and conditions for success in general (i.e., to investigate boundaries and potentials of sharing and commoning practices from the perspective of different users) and (b) on the possibilities for the continuation of the Garage

Figure 10. Collaborative mapping at the Vienna ProSHARE-Lab.

Grande (network) in particular. To do that the lab activities include collaborative processes such as a workshop with Garage Grande's urban initiatives and the GB*West, experimentation with open-source digital collaborative tools (i.e., MAZI), and an open discussion concerning sharing practices in housing.

Insights from the first phase of the lab revealed that space-sharing is recognised as relevant among a wide range of participants: It is perceived to contribute to fostering senses of belonging, self-empowerment, and solidarity, enhance mutual community assistance, and facilitate access to more (shared) resources. In particular, participants shared the perception that places like Garage Grande, in which different types of urban commoning practices and social networks can develop and become visible, need to be further facilitated, supported, and maintained. The ULL also allowed researchers to reflect with participants on different socio-cultural dimensions that influence or hinder space-sharing and commoning practices. One of the findings suggests that poverty and associated feelings of shame function as triggers of exclusion in sharing and commoning, dimensions which seem to be often neglected in debates about sharing practices.

5. Discussion

Previous sections explored the functioning of the ongoing ProSHARE-Labs, how they facilitate sharing and space-commoning knowledge practices, and how they foster different forms of co-produced knowledge with a view to test forms of implementing change. Based on these descriptions and our analytical framework of five main criteria—(a) focus/objectives, (b) level of institutionalisation and stakeholders (con-)figurations, (c) forms of sharing and space-commoning practices, (d) co-production approaches and knowledge practices, and (e) impacts of spatial knowledge—we propose the following cross-case evaluation of the labs.

5.1. Focus/Objectives

All ProSHARE-Labs represent non-commercial places which share a transformative goal and overarching objectives—i.e., to explore, test, and expand sharing practices in their neighbourhoods. Within a common methodology strategy, the labs nevertheless adapted their specific focus to address context and users' requirements. The Berlin lab stresses the transfer of the coproduced spatial knowledge into (small scale) planning and architectural interventions (with private and academic sectors alongside residents and urban initiatives), the Paris and London labs emphasise rather the maintenance of existing community-led sharing practices and knowledge claims, while Vienna focuses on networking and knowledge exchange. All labs and their embedded urban initiatives share however the need and challenge to diversify and expand their capacity to include new members.

5.2. Level of Institutionalisation and Stakeholders (Con-)Figurations

Although the four labs sought and succeeded to some extent to use the initial generated knowledge to develop and test sharing prototypes of diverse sorts, they also encountered limitations and pitfalls related to the labs' level of institutionalisation and the characteristics of stakeholders' collaborations. The Paris and London cases benefited from local long-term sustained community-led hubs linked to translocal networks (e.g., R-Urban) that facilitated generating and integrating community knowledge in the development of their actions. The Vienna lab is representative of cases that require more involvement of private-public partnerships to secure shared spaces in the first place in which then to initiate actions and knowledge exchange. The Berlin case, in turn, is illustrative of labs initiated by academic and professional collaborations (despite the central role of the local community group in the processes of co-designing and prototyping) and remains largely contingent to research funding and securing the involvement of public actors for their continuation and implementation.

The plurality of participating actors and differences concerning their engagement in the labs became evident in the cross-lab evaluation processes: from public policymakers, local organisations, and residents (Bagneux, London) to professionals, urban renewal agents, private developers, and urban initiatives (Berlin and Vienna). Yet, labs' participants were not always representative of the neighbourhoods' populations: Certain groups, communities, and individuals of different ages, social statuses, or ethnic backgrounds remained underrepresented. Among communities lacking representation we identified residents with long-term immigrant background (London), recent migrants (Berlin and Vienna), and youth (Bagneux).

Concerning stakeholders' involvement, in the labs located in suburban neighbourhoods with a high proportion of social housing, institutional and local political actors were well represented as *drivers* but also as *blockers* (Bagneux and London). In the labs situated in inner-city neighbourhoods that are characterised by privately owned housing, we recognised a stronger proportion of committed citizens and urban initiatives (Berlin and Vienna). Therefore, in the first case, the labs' actions focused more on creating new commoning activities involving excluded segments of local population (youth, immigrant women, etc.) and generating collaborations (rather than competition) across organisations, while in the second case, they were more concerned with preserving commoning places and sharing activities amid ongoing gentrification processes.

Also relevant was the role played by *researchers* within the different ULLs stakeholders (con-)figurations: In all four labs, (academic) researchers assumed *hybrid* roles, not merely as analysts but also as activists, advisors, and facilitators. The added value of the involvement

of (academic) researchers depended therefore on the ULL context, timeframe, and level of institutionalisation, as they adopted and shifted between different roles for establishing, facilitating, mediating, and/or participating in mechanisms and dialogues for knowledge exchange.

5.3. Forms of Sharing and Space-Commoning Practices

The research showed that a plurality of sharing practices studied within the labs takes place in non-commercial spaces often benefitting from private (as in Vienna and, to a lesser extent, Berlin) or public support (Bagneux and London). Organised and supported sharing practices by the city however sometimes inhibit other more spontaneous and informal forms of sharing. In the context of Bagneux, for instance, some of the sharing practices and the organisations behind them are competing for funding or recognition to the detriment of the whole ecosystem of sharing in the neighbourhood. In the case of Vienna's Garage Grande, sharing practices seem to be somehow *oriented* towards the smooth implementation of planned new developments.

5.4. Co-Production Approaches and Knowledge Practices

Framed within the shared methodological strategy based on self-assessment, co-designing, and prototyping, all four labs resorted to similar methods. These included open digital mapping platforms (Adhocracy in Berlin and Gogocarto in Paris and London) that allowed to co-produce context-sensitive spatial knowledge, informative, analytical, and actionable for the community (Bell & Pahl, 2018). These digital participative tools, whatever their degree of openness and accessibility, did however create exclusions, particularly among elderly and less affluent populations. Therefore, in all labs, they were backed up by analogue modes of participation which are more flexible, intuitive, and straightforward, requiring fewer resources and enabling their implementation in a wider range of settings. This was complemented in Berlin with technically supported digital mapping sessions and training to use the MAZI intranet technology with resident groups including migrant populations. All in all, we can say that all four labs generated both empirical and processual spatial "knowledge claims" (Rydin, 2007), with the aim of becoming normative in their later stages. However, to a certain extent, all labs still acknowledged an imbalance concerning the representation of community and the manifestation of tacit forms of knowledge given the fact that despite the measures taken (i.e., dedicated lab sessions and technical assistance), some parts of the population barely participated.

5.5. Impacts of Spatial Knowledge

The impact of the co-produced spatial knowledge on sharing and space-commoning is twofold. On the one hand, it influences the participating actors who learned and prototyped "proto-practices" (Kuijer, 2014) of sharing in the neighbourhood. In Bagneux and London specifically, the labs' activities helped to make visible and expand the sharing ecosystem controlled by public authorities. The public actors invited to participate in the sessions understood the importance of these issues. On the other hand, such co-produced knowledge constitutes a basis for planning processes that can be mobilised by different actors such as urban initiatives, practitioners, and policymakers. One of the specificities of the labs is their focus on spaces and places where spatial commoning takes place. Vienna's case puts forward the role of temporary commoning facilities in improving processes of urban renewal, while Bagneux and London's cases highlight the role of new types of built infrastructure for social-ecological transition—the commons-based eco-civic hubs.

All these forms of local learning, spelt in self-assessment processes, could directly benefit local planning processes. In addition, the comparative study across the labs and the incremental implementation of activities in the four different locations (Figure 3) also enabled processes of joint learning that can eventually produce translocal methodological knowledge and upscaling possibilities. The four lab's parallel and related functioning provided the possibility of a different way of learning in planning, a sort of "meta-learning" (Scholl et al., 2022) which goes beyond learning locally.

6. Conclusion

ProSHARE-Labs have stressed the importance of places where processes of exchange, negotiation, and co-creation of spatial knowledge can take place between a diversity of stakeholders—often adopting hybrid roles within complex stakeholder constellations—from urban renewal offices and developers to professionals, policymakers, civic organisations, and inhabitants from different cultural backgrounds, including recently arrived migrants. As such, the labs bring together in one location expert, sectoral, tacit, and community knowledges (Pfeffer et al., 2013) on sharing and space commoning practices.

Preliminary insights from all labs posit that having more sharing and space-commoning in a neighbourhood can support communities to become more resilient towards threats of gentrification and increase their wellbeing. This situated knowledge(s) can further inform planning and public policy on how to protect, support, and co-create a diversity of forms of sharing, including those which take place informally and especially along urban regeneration processes (Petrescu et al., 2021). Moreover, knowledge about who are the enablers and inhibitors of existing sharing practices can become "normative'' (Rydin, 2007) and help support ecosystems of sharing through policy and can enlarge the vision of a socially just neighbourhood transformation.

Also, the labs raised the question of the sustainability of temporarily produced urban commons, during neighbourhood transformation processes, highlighting the necessity of supporting existing spaces of commoning which are functioning in temporary locations as "trading zones" for the negotiation of differences (Rizzo et al., 2021), like in Vienna, through providing resources and infrastructures for their expansion. Part of these infrastructures could be the labs themselves which, following the model of the lab in Berlin, can be nested in a community centre, or as the eco-civic hubs in Bagneux and London, can be embedded in long-term processes to gain community ownership and to offer a temporary critical space that can influence these processes. In this way, sharing and space-commoning knowledge become more complex, capturing information about how to sustain over time collaborative modes of making, using, and managing spaces in the city. Despite existing limitations, in particular about the inclusion of less represented populations, these successful labs' experiences also highlighted the role of long-term involvement of engaged professionals and local experts (designers and social and cultural workers) to accompany and complement the temporary presence of researchers and to mediate processes across different stakeholders.

Based on the spatial knowledge that resulted from the different research phases, which was both empirical and processual (Rydin, 2007), the ProSHARE-Labs were co-designing and prototyping actions to be directly implemented in planning practice by all stakeholders, from experts and policymakers to the community members themselves. Some of these actions concerned the collective physical transformation of urban spaces (Berlin), others the collective activities that shared spaces generate (Vienna, Paris, and London). In both instances, the labs acted as "legitimizing spaces" (Karvonen & van Heur, 2014) and played an important role in the management and deployment of spatial knowledge on sharing and space commoning practices, transforming it into a valuable and accessible resource for the community and the city. Also, the methodological sharing across different labs allowed translocal learning and possibilities for up-scaling of the situated knowledge(s), which otherwise would remain hyper-contextualised, this being often perceived as one of ULLs pitfalls (Scholl et al., 2022).

The labs also advocate for better integration of the added value of co-creative and experimental methods of spatial knowledge production in mainstream planning processes. However, as the research also shows, these co-creative methods can sometimes exclude and therefore fail to capture the full diversity of spatial knowledges. The methodological approaches adopted by the ProSHARE-Labs seek to identify forms of exclusion in sharing (via survey, interviews, and mapping) to later attempt to contribute to their remediation via co-designing and prototyping of propositional actions addressing these forms of exclusion directly. As such, we tried to demonstrate that carefully inclusive methodologies and long-term processes can make ULLs become a real tool for contributing with *situated spatial knowledge(s)* to further democratic practices of planning.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

The Scaling Potential of Experimental Knowledge in the Case of the Bauhaus.MobilityLab, Erfurt (Germany)

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Abstract
Real-world labs hold the potential to catalyse rapid urban transformations through real-world experimentation. Characterised by a rather radical, responsive, and location-specific nature, real-world labs face constraints in the scaling of experimental knowledge. To make a significant contribution to urban transformation, the produced knowledge must go beyond the level of a building, street, or small district where real-world experiments are conducted. Thus, a conflict arises between experimental boundaries and the stimulation of broader implications. The challenges of scaling experimental knowledge have been recognised as a problem, but remain largely unexplained. Based on this, the article will discuss the applicability of the "typology of amplification processes" by Lam et al. (2020) to explore and evaluate the potential of scaling experimental knowledge from real-world labs. The application of the typology is exemplified in the case of the Bauhaus.MobilityLab. The Bauhaus.MobilityLab takes a unique approach by testing and developing cross-sectoral mobility, energy, and logistics solutions with a distinct focus on scaling knowledge and innovation. For this case study, different qualitative research techniques are combined according to "within-method triangulation" and synthesised in a strengths, weaknesses, opportunities, and threats (SWOT) analysis. The analysis of the Bauhaus.MobilityLab proves that the "typology of amplification processes" is useful as a systematic approach to identifying and evaluating the potential of scaling experimental knowledge.

Keywords
amplification processes; Bauhaus.MobilityLab; experimental knowledge; real-world experiments; real-world labs; scaling; urban transformation

Issue
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1. Introduction

In a fast-changing and increasingly complex urban environment, where urbanisation and sustainability challenges overflow institutional, regional, and ontological boundaries (Kullman, 2013), real-world labs (RWLs) are increasingly gaining attention to initiate urban transformation processes (Kern & Haupt, 2021; Renn, 2018; Schneidewind et al., 2018; Singer-Brodowski et al., 2018).

The term "real-world lab" (*Reallabor*) is predominantly known in German-speaking countries and is defined as follows: RWLs provide the research infrastructure to conduct real-world experiments (RWEs) where co-creation of the research process (Defila & Di Giulio, 2018; Engels & Rogge, 2018; Kern & Haupt, 2021), co-production of knowledge (Borner & Kraft, 2018; Kern & Haupt, 2021; Renn, 2018; Schneidewind et al., 2018), and social learning (Kern & Haupt, 2021; Parodi et al., 2017; Schäpke et al., 2017; Singer-Brodowski et al., 2018) are of central importance. Thus, RWLs have conceptual similarities with the more widespread term "urban living labs" (Kern & Haupt, 2021). However, RWLs may concern a larger spatial unit of experimental activities (Kern & Haupt, 2021) such as city districts, entire cities, or even regions (Schäpke et al., 2017). Further, RWLs differ from

urban living labs in their explicit focus on the temporal as well as spatial dimensioning of scaling experimental knowledge (Kern & Haupt, 2021). Nonetheless, the extent to which the experimental knowledge from an RWL (or an urban living lab) can move beyond experimental boundaries is largely unexplained (Evans & Karvonen, 2011; Kern & Haupt, 2021). The scaling of experimental knowledge from RWLs has been recognised as a problem but has barely become the object of systematic research (Kern & Haupt, 2021).

This article proceeds to outline current discussions on urban transformation through experimentation and what role experimental knowledge plays in urban planning. Thereupon, current research on scaling experimental knowledge, and in particular its constraints, are highlighted. Based on this, the study addresses the following research question: How does the "typology of amplification processes" by Lam et al. (2020) contribute to identifying, systematising, and evaluating the potential of scaling experimental knowledge of RWLs?

The typology, according to Lam et al. (2020), provides a promising framework to systematically understand and categorise different facets of scaling. The Bauhaus.MobilityLab (BML) in Erfurt, the capital of Thuringia, Germany, serves as an example of the application of the typology: In line with the notion of RWLs, the BML embraces a collaborative and interdisciplinary process that aims to shape new urban transformation. It tests and develops sustainable and intelligent mobility, logistics and energy solutions with a distinct focus on artificial intelligence (AI) approaches (BML, 2021). The BML innovation district Brühl serves as the nucleus of experimentation. However, experimental activities also take place outside Brühl and spread across the entire city of Erfurt. The experiments include incentivising mobility behaviour, pedestrian sensors, data management, last-mile logistics, and smart energy applications. Erfurt represents a prototypical European city, and thus promises scaling potential to other similar locations in Germany and Europe. The application to other areas, such as data-based services in the housing industry, the healthcare industry, in the area of eGovernment, smart city, or the financial sector is also intended (Bauhaus.MobilityLab Consortium, n.d.). Thus, the analysis of the BML allows drawing conclusions about the applicability of the typology, as well as the potential of scaling experimental knowledge of RWLs.

2. Urban Transformation Through Experimentation

According to Dorstewitz (2014, p. 434), "there is an increasing focus on processes of knowledge production [in urban planning], which gives a rise to the notion of 'urban laboratory.'" Therefore, it is necessary to understand what role RWLs, and in particular RWEs, play in knowledge production and urban planning.

As RWEs are restricted in their spatial and temporal reach, they strongly counter the traditional notion of comprehensive and long-term urban planning. "However, considering rather recent planning theory, linear-hierarchical stringent approaches to planning no longer seem to exist" (Räuchle, 2021a, p. 210). Instead, new forms of urban planning have emerged that are reflexive, responsive, and spatially delineated (Karvonen, 2018). Yet, there is no clear understanding of the ultimate role that RWEs can or should play in urban planning (Räuchle, 2021a; Voytenko et al., 2016). Also, according to Karvonen and van Heur (2014), there are conflicts and overlaps between RWEs and urban planning. On the one hand, "it is largely unclear whether far-reaching effects can be achieved at all through experimental approaches" (Räuchle, 2021a, p. 208). On the other hand, new forms of urban planning and RWEs are similarly interpreted as a collaborative, interdisciplinary process, concerning knowledge-intensive research activity and constituting place-specific trial-and-error interventions (Karvonen & van Heur, 2014). However, as Räuchle (2021a, p. 210) points out:

> There is one main difference: Urban planning aims to intervene in urban spaces and change them, whereas RWEs, in a first step, aim at revealing and explaining (causal) relationships between different dimensions in urban spaces. Only in a second step shall RWEs have a transformative effect in urban spaces.

Thus, the question arises of how experimental knowledge from RWE can be integrated into urban planning.

2.1. Experimental Knowledge in Urban Planning

In recent urban planning theory, knowledge has been recognised as socially constructed (Räuchle, 2021b), thus implying multiple forms of knowledge (Innes, 1995; Khakee et al., 2000). For instance, strict, deterministic, general knowledge has been gradually replaced by experimental knowledge which explores randomness, uniqueness, ambiguity, and unpredictability (Khakee et al., 2000), and thus matches the notion of "urban," where processes are notoriously inexact, improvised, and often uncontrollable (Dorstewitz, 2014). Despite high expectations, the far-reaching, sustainable urban transformation through experimental knowledge from RWLs failed to materialise. Respectively, there is a lack of theoretical and empirical evidence on the relationship between RWLs and urban transformation (Kern & Haupt, 2021; Räuchle, 2021b; von Wirth et al., 2019; Voytenko et al., 2016).

Räuchle (2021a), Beecroft et al. (2018), and ProClim (1997) distinguish three types of experimental knowledge: "knowledge about the urban context (system knowledge) and their own normative goals (target knowledge), [as well as] knowledge about how to achieve the set goals (transformation knowledge…)" (Räuchle, 2021a, p. 210). Thus, the knowledge produced in RWEs is of interest to urban planning (i.e., "system and target

knowledge"; Räuchle, 2021a). "Transformation knowledge" may be used as an instrument in urban planning (Räuchle, 2021a). Schäpke et al. (2017, p. 210) add the concept of "actionable knowledge." This knowledge refers to an evidence-based orientation for practically implementable actions, and thus relates to "transformation knowledge." "Actionable knowledge" describes strategies that have successfully solved—or at least reduced—sustainability problems within the framework of an RWE (Forrest & Wiek, 2014; Frantzeskaki & Kabisch, 2016; Schäpke et al., 2017). It becomes evident that RWLs are caught between understanding ("system knowledge") and shaping urban transformation processes ("transformation knowledge"; Räuchle, 2021b; Schäpke et al., 2017). "With this postulated dual goal, a real-world lab…combines the implementation of concrete, real-world interventions…with their analysis and evaluation as well as the derivation of fundamental mechanisms of action with regard to the desired transformation" (Schäpke et al., 2017, p. 12).

Experimental knowledge production is a highly formalised process in RWLs (Bulkeley & Castán Broto, 2013; Kern & Haupt, 2021; Voytenko et al., 2016). The formalisation is particularly evident in its recursive nature (Evans & Karvonen, 2011; Kern & Haupt, 2021). Recursive knowledge aims to constantly develop, adapt, and thereby improve existing knowledge (Kern & Haupt, 2021; Tenberg, 2006). In practice, experimental knowledge in RWL is therefore characterised by repeated trial and error (Bulkeley et al., 2016; Kern & Haupt, 2021; Nesti, 2018; von Wirth et al., 2019; Wolfram & Frantzeskaki, 2016). At this point, it is important to note that the outcome of an RWE is "open," meaning that a successful RWE is not guaranteed (Räuchle, 2021a). Yet even failure may produce useful knowledge (Räuchle, 2021a).

2.2. Scaling Experimental Knowledge

In the case of success, an RWE could be a concrete example of how to solve problems in other sufficiently similar contexts (Dorstewitz, 2014). According to Lam et al. (2020), a context is considered similar when basic social, ecological, political, or technical structures and dynamics do not differ significantly. Nonetheless, ever-changing contexts "make it more difficult or even impossible to observe cause-and-effect relationships between [context] dependent and independent variables" (Räuchle, 2021a, p. 209).

However, to make a significant contribution to urban transformation, the experimental knowledge of RWLs must go beyond the level of the building, street, or small district where RWEs are conducted (Dijk et al., 2018). Yet, there seems to be a rather fragmented understanding of the constraints on scaling experimental knowledge (Dijk et al., 2018), which is discussed in the following.

According to Kern and Haupt (2021), urban transformation requires the scaling of experiments while concerning the temporal and spatial dimensions of scaling. The temporal dimension of scaling faces the challenge that experiments are limited in time (Karvonen, 2018; Kern & Haupt, 2021). The question, therefore, arises as to how successful experiments can be sustained in the medium and long term (Kern & Haupt, 2021). In this respect, the perpetuation of the experiments is strongly dependent on funding and permanent institutionalisation (Kern & Haupt, 2021).

The spatial dimension of scaling refers to the spatial limitation of RWEs, which means that the results of successful experiments often cannot be directly scaled to another context (Dijk et al., 2018; Kern & Haupt, 2021). The problem lies in the decontextualisation of experimentation and the generalisation of knowledge (Ceschin, 2014; Leino & Åkerman, 2021; Schäpke et al., 2017; Van de Walle, 2017). In each new context, an experiment is repeated but with a new interpretation (Leino & Åkerman, 2021) and thus always dealing with improvisation as well (Freeman et al., 2011; Leino & Åkerman, 2021). Kern and Haupt (2021) suggest that institutionalisation plays an important role in the spatial dimension of scaling, too. Institutions influence experiments, and conversely, experiments can contribute to institutional change (Fuenfschilling et al., 2019; Kern & Haupt, 2021; McFadgen & Huitema, 2018). The medium and long term urban transformation therefore strongly depends on whether it is possible to embed RWLs and their experiments both temporally and spatially in existing institutional arrangements (Kern & Haupt, 2021).

However, the idea of scaling experimental knowledge clashes with siloed institutions, where there are clear and separate mandates for different officials and administrative departments (Leino & Åkerman, 2021). Siloed institutions are both embedded in an obdurate system and a deep-rooted habit (Leino & Åkerman, 2021). Thus, RWLs and RWEs intervene with the usual proceedings of institutions (Leino & Åkerman, 2021). In turn, it becomes rather elusive how to promote scaling experiments through institutionalisation.

Another constraint is that "many of the [real-world] experiments that emerge…are characteristically ambiguous, involve contradictory interests, and have evolving goal settings" (Leino & Åkerman, 2021, p. 11). This raises concerns over poor experimentation management resulting in information gaps, poor budgeting and documentation, as well as unclear roles of actors (Leino & Åkerman, 2021). Further, the degree to which an experiment can stimulate broader urban transformations much relies on the ability of actors to "jump scales," meaning to engage with actors on higher scale levels and shift the local power balance in favour of the experiments at the expense of vested interests (Dijk et al., 2018; Leino & Åkerman, 2021). However, the actors conducting experiments are often not the ones who set goals of scaling the knowledge from experimentation (Leino & Åkerman, 2021), which in turn highlights the lack of systematic consideration of scaling experimental knowledge.

It becomes evident that scaling experimental knowledge from RWLs requires the extraction of generic, process-related, and context-specific factors (Brown & Vergragt, 2008; Forrest & Wiek, 2015; Schäpke et al., 2017; Westley et al., 2014). Sharp and Raven (2021, p. 196) highlight that "there is a need to explore the enabling conditions and processes across multiple experiments and domains and across time-frames that go beyond those of single, 'projectified' experiments." The BML is developing a cross-sectoral laboratory infrastructure to conduct numerous experiments across different domains. In addition, it aims to be operated long term by developing the "lab as a service" concept (see Section 4). Thus, the BML allows exploring the scaling potential of experimental knowledge.

The "typology of amplification processes" by Lam et al. (2020) represents a relevant approach to identifying and systematising scaling processes. The scaling processes are divided into three categories and eight processes (see Section 3) and thus cover a large variety of processes. The typology caters specifically to sustainable initiatives, which foster new ways of thinking, doing, and organising social, technological, economic, socio-technical, and/or socio-ecological structures. Experiments in RWLs have similar traits and approaches to what Lam et al. (2020) describe as sustainable initiatives. Thus, the "typology of amplification processes" can be applied to the notion of RWLs.

3. Theoretical Framework

The amplification processes by Lam et al. (2020) are aggregated into the following three categories: amplifying within, amplifying out, and amplifying beyond. The categories include eight processes: stabilising, speeding up, growing, replicating, transferring, spreading, scaling, and scaling deep (see Figure 1). For this research, the following description of the processes already refers to RWLs and RWEs instead of sustainable initiatives, as originally formulated by Lam et al. (2020).

Amplifying within relates to processes that generally seek to increase the knowledge of RWLs by prolonging or speeding up the way an RWE produces knowledge (Lam et al., 2020). "Stabilising" means that RWLs are strengthened and embedded deeper in their context to make them more resilient to future challenges and to ensure that their impact lasts longer. It indicates that RWLs take action to capitalise on the existence of members, supporters, or users. In addition, it refers to processes that professionalise a streamlined work process as well as clear communication of purpose and mission. "Speeding up" involves the acceleration of mechanisms to produce knowledge from RWEs (Lam et al., 2020).

Amplifying out describes processes that seek to increase the experimental knowledge or the number of RWEs by involving more people and places (Lam et al., 2020). This category is divided into two subcategories according to the location of processes in similar or dissimilar contexts (see Figure 1). When basic social, ecological, political, or technical structures and dynamics do not differ significantly, a context is considered similar. Further, amplifying out differentiates processes that are dependent or independent, meaning whether they are dependent on the existing RWLs or not (see Figure 1). The first subcategory, including "growing" and "replicating,'' refers to processes that generate RWEs on existing RWLs. "Growing" concerns the expansion of experimental knowledge across a geographical location, organisation, or sector. To do so, the RWLs reach out with their programmes, products, solutions, or services, or by establishing affiliates that depend on the existing RWL. "Growing" and "replicating" describe comparable processes, only that "replicating" refers to processes in dissimilar contexts. The second subcategory concerns processes that create independent RWEs either by "transferring'' the RWE to another place with a similar context or by "spreading" the principles of an existing RWL to a dissimilar context. In contrast to the "growing" process, a similar but independent RWL emerges (Lam et al., 2020).

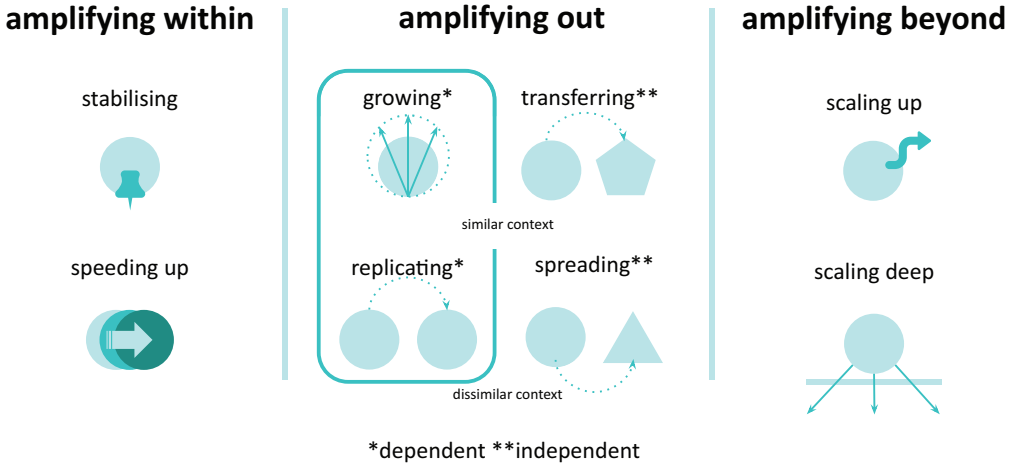

Figure 1. Typology of amplification processes based on Lam et al. (2020, p. 11).

Amplifying beyond involves processes that aim to increase their impact by reaching higher institutional levels ("scaling up") or by changing values ("scaling deep"; Lam et al., 2020). "Scaling up" includes codifying the knowledge of RWEs in laws, policies, or institutions through, for instance, lobbying, networking, or supporting alternative visions and discourses. "Scaling deep" involves processes that address the change of values, norms, and beliefs through fostering new mindsets, changing perceptions, and introducing new ways of relating and knowing as well as new value systems. Amplifying beyond processes differs from the other categories in that it suggests rethinking how RWLs produce knowledge (Lam et al., 2020).

The "typology of amplification processes" by Lam et al. (2020) represents a promising framework to identify and systematise the scaling potential of experimental knowledge. However, it is necessary to recognise that RWEs are complex, non-linear, context-specific, and place-based processes, which may even lead to negative, unanticipated, social, and environmental side effects (Evans & Karvonen, 2011; Lam et al., 2020; Schäpke et al., 2017; Smith et al., 2014). Thus, the scaling of experimental knowledge from RWLs cannot be characterised as positive or negative per se, nor do the described processes apply to all contexts and RWEs (Lam et al., 2020). In addition, the typology does not explicitly address contextual dependencies, which according to Dijk et al. (2018) display a constraint on scaling, or in this case, amplifying processes.

Nevertheless, the typology allows distinguishing different processes of amplification as well as individual interpretation of scaling experimental knowledge. Thus, it may even allow considering contextual dependencies.

4. Case Study: Applying the Amplification Processes to the Bauhaus.MobilityLab

In line with the vision of "innovation by experiment," the BML in Erfurt, Germany aims to provide a real-world environment for the development and testing of innovative solutions in the areas of mobility, energy, and logistics (Fraunhofer-Institut für Techno- und Wirtschaftsmathematik, 2022). With its 213,000 inhabitants, Erfurt, the capital of Thuringia, is an exemplary major European city (Bauhaus.MobilityLab Consortium, n.d.). According to the BML, the size of the city, measured by the number of inhabitants, the building structure, and the traffic integration suggest that Europe-wide scalability can be expected (Bauhaus.MobilityLab Consortium, n.d.).

The central component of the BML is its cloud platform, an open information and communication technology ecosystem ("BML-EcoSys") for RWLs (Institut für Innovation und Technik, 2021). On this AI-lab platform, collected and processed data is made available, interconnected, and evaluated. Therefore, AI algorithms are trained and optimised until they can analyse the data automatically. The district of Brühl in Erfurt serves as an RWL and nucleus for conducting experiments: Traffic lights are switched according to traffic volume, deliveries are delivered in a more customer-oriented manner, local energy generation reduces electricity costs, and intelligent tariff systems determine the charging price for e-cars. The idea is to test numerous data-based applications, which in turn will be evaluated on the project's AI-lab platform (Institut für Innovation und Technik, 2021).

The BML has a duration of three years (2020–2023) and is funded by the Federal Ministry for Economic Affairs and Energy to establish a "lab as a service." The "lab as a service" concept allows companies and initiatives to utilise the BML infrastructure, based on the AI-lab platform and the RWL, to test and develop new products and services. The interdisciplinary consortium consists of stakeholders from research institutions, companies, universities, and the city of Erfurt and is responsible for setting up the AI-lab platform and the BML innovation district Brühl. The network is complemented by lab users, lab customers, and infrastructure partners. The locally present and Europe-wide networked partner alliance promotes the BML in business, politics, and science (BML, 2021) and thus allows direct access to educational institutions and political lobbies. In addition, the BML is part of the national programme "Reallabore—Testräume für Innovation und Regulierung" (Real-World Labs—Test Sites for Innovation and Regulation) and is also taken into account for the development of legal foundations and the acquisition of knowledge by legislators (Bundesministerium für Wirtschaft und Klimaschutz, 2022). To build the lab infrastructure, the BML is organised in eight work packages (WPs): project management, AI-lab platform, infrastructure and data integration, AI technology, living lab, lab tools, lab innovations, and transfer and public relations. According to the respective function, different consortium partners work together in each WP (Bauhaus.MobilityLab Consortium, n.d.).

With its combination of an RWL and the AI-lab platform, the BML pursues a unique approach to producing and processing experimental knowledge that is "scalable and transferable to other municipalities" (Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung, 2022). According to the BML, the selection of Erfurt as a "typical large European city" is also based on the idea of scaling the knowledge from the RWEs to other contexts (Institut für Innovation und Technik, 2021). As the "lab as a service" concept is still in an implementation phase at the time of the research (June 2021), the focus lies on how experimental knowledge is produced in the BML based on the organisation, structure, and characteristics of the RWL, and how this reflects on the scaling potential of experimental knowledge.

4.1. Methodology

The research method "case study" entails the detailed and intensive analysis of a single case (Bryman, 2012).

In this case, the analysis evolves around the complexity and particular nature of the BML and aims to contextualise the research to create a better understanding of the study's specifics and its implications for the analysis.

The BML is one of many RWLs in the national laboratory programme "Reallabore" (see Section 4). Thus, the case study on the BML is considered to be an exemplifying case and implies useful results for other RWLs. In addition, it concerns a relevant research aim in the RWL field research and, therefore, allows engaging with the theoretical analysis provided by the literature review (see Section 2).

The study combines different qualitative research methods according to the "within-method triangulation" (Denzin, 1978, p. 301). Besides the desk-based examination of secondary data, such as project publications, presentation slides, images, illustrations, and websites, the case study involves primary data derived from qualitative methods, such as semi-structured interviews and participant observations.

Expert interviews play a central role in the research. A total of eight experts were interviewed. Based on their expertise and insight-knowledge, the BML WP leaders are considered to be valuable interview partners for this research. In addition, a representative of the associated BML partner aspern.mobil LAB, in Vienna, was interviewed. As a network of different stakeholders, the insights of the RWL partner provide relevant data regarding cooperation and knowledge transfer.

According to Jorgensen (1989, p. 2), participant observation "is exceptional for studying [amongst other things] processes…the organisation of people and events, continuities over time, and patterns." In consultation with the BML, the researcher participated in jour fixe meetings, the BML consortium meeting, and the living lab network meeting with the RWL MaaS L.A.B.S. The jour fixe meetings are weekly meetings of the individual WP, where work status updates and organisational matters are shared. The consortium meeting involves all BML partners and WPs and takes place every three to four months. The exchange during the consortium meeting serves to present the work status of the WPs and to clarify intersections, ideas, and coordination needs between the subprojects. The meeting between MaaS L.A.B.S. and BML was a first-time exchange of experiences and interests between the RWLs.

With the help of the different research methods, data on the goals and work processes of the BML, as well as the networking and communication between individual partners, the whole consortium and another RWL could be gathered. Following the "typology of amplification processes" by Lam et al. (2020), the collected data were clustered into the three categories of amplifying within, amplifying out, and amplifying beyond as well as their sub-processes. This allows a differentiated identification of processes for potentially scaling experimental knowledge of the BML. The results of the analysis are summarised using a strengths, weaknesses, opportunities, and threats (SWOT) analysis. This ensures a critical evaluation of the potentials and challenges for scaling experimental knowledge in the case of the BML.

4.2. Amplification Processes of the Bauhaus.MobilityLab

To identify and evaluate amplification processes according to Lam et al. (2020), a distinct focus of the analysis lies on the preconditions for experimental knowledge production and measures for scaling experimental knowledge. For instance, in the following analysis, "stabilising" (amplifying within) processes focus on the way of working to secure a streamlined process and clear communication of purpose and mission, while "speeding up" (amplifying within) focuses on the BML's ways to increase the time and pace of organisational or implementation processes and thus increase experimental knowledge. Regarding the second category, amplifying out, the BML sets important prerequisites to involve more people and places that all show dependency on the BML AI-lab platform. For this reason, the independent processes of "transferring" and "spreading" were not considered in this analysis. Finally, the last category, "amplifying beyond," emphasises to what extent preconditions for a regime shift in higher institutional levels ("scaling up") and people's mindsets ("scaling deep") are created. In this respect, vision, enthusiasm, and intrinsic motivation play an important role. Overall, amplification processes were identified in all categories of the typology. Using the SWOT analysis, the identified processes for amplification were evaluated concerning existing potentials and obstacles (see Figure 2).

The committed and competent project partners are a central *strength* of the BML (WP 4, interview 2021-03-23; WP 6, interview 2021-03-22). This allows capitalising on existing resources ("stabilising" and "scaling up"). For example, the project partner Bauhaus-Universität Weimar utilised its network and brought the partners Bosch, Siemens, BPV Consult, and highQ on board of the research project (WP 6, interview 2021-03-22). The same applies to other project partners. In addition, the BML benefits from products and services, such as mobile applications (highQ) and sensors (Bosch) that companies bring into the project. This shows that the cooperation in the consortium is very trusting and allows project partners to benefit from joint resources (WP 6, interview 2021-03-22). Another strength is that the project partners from academia transfer knowledge produced by the BML into teaching (WP 2, interview 2021-03-22) and, thus, are directly involved in fostering new mindsets ("scaling deep"). Furthermore, as part of the national lab programme "Reallabore—Testräume für Innovation und Regulierung" (Bundesministerium für Wirtschaft und Klimaschutz, 2022), experimental knowledge is codified in laws and policies ("scaling up"), allowing to engage with higher institutional levels. A particularly unique feature of the BML is the cross-sectoral approach, which is conducive to expanding the experimental scope across

different sectors ("growing"). The AI-lab platform supports this cross-sectoral approach by intelligently linking mobility, logistics, and energy data. It is available for other RWLs and lab customers who can use the AI-lab platform for data processing or the provision of AI tools (WP 6, interview 2021-03-22). Also, the AI-lab platform enables low-threshold transferability and thus the scaling of experimental knowledge. "For our AI methods, it doesn't matter whether these sensors are located in Erfurt or London" (WP 3, interview 2021-03-30). Thus, standardised data formats and the application of AI tools make it possible to extend the AI-lab platform and related services into similar ("growing") but also dissimilar contexts ("replicating").

However, the cross-sectoral and interdisciplinary cooperation between project partners can be a challenge or *weakness* for amplification processes ("stabilising"). WP 2 leader describes it as follows: "What I often find difficult is actually the wording. You notice that a lot of different disciplines come together, which sometimes use terms differently" (WP 2, interview 2021-03-22). A lack of common understanding of terminology is an obstacle to a common purpose and mission ("stabilising"). This also results in a lack of clear internal and external communication ("stabilising and growing").

In this regard, use cases represent an *opportunity* to make the BML more tangible ("stabilising" and "growing"). The identified lack of understanding of the complex project purpose and goals makes it necessary to not only improve communication with lab users and customers but also to involve them more in the product and service development process ("growing"; WP 5, interview 2021-03-25). Working with a marketing agency additionally helps to make the communication more effective in terms of publicity (WP 7, interview 2021-03-26). By reaching out to more people and getting them involved, important conditions are created to achieve a greater scaling potential, for example by promoting a change of values, norms, and beliefs ("stabilising" and "scaling deep"). Furthermore, the creation of a project-internal wiki contributes to clear communication of purpose and mission ("stabilising") but is also beneficial for the project organisation to find relevant content more quickly and easily ("speeding up"; WP 6, interview 2021-03-22; WP 5, interview 2021-03-25).

Finally, the informal character of networking and exchange with other living labs and associated partners, i.e., the aspern.mobil LAB, is considered a *threat*. Future cooperation may also suffer from the lack of insight into the complex, technical approach to the BML (aspern.mobil LAB, interview 2021-03-24).

4.3. Discussion

The literature review makes it clear that experimental knowledge production in RWLs is highly context-dependent and thus difficult to generalise. However, the analysis of the BML suggests that there are processes

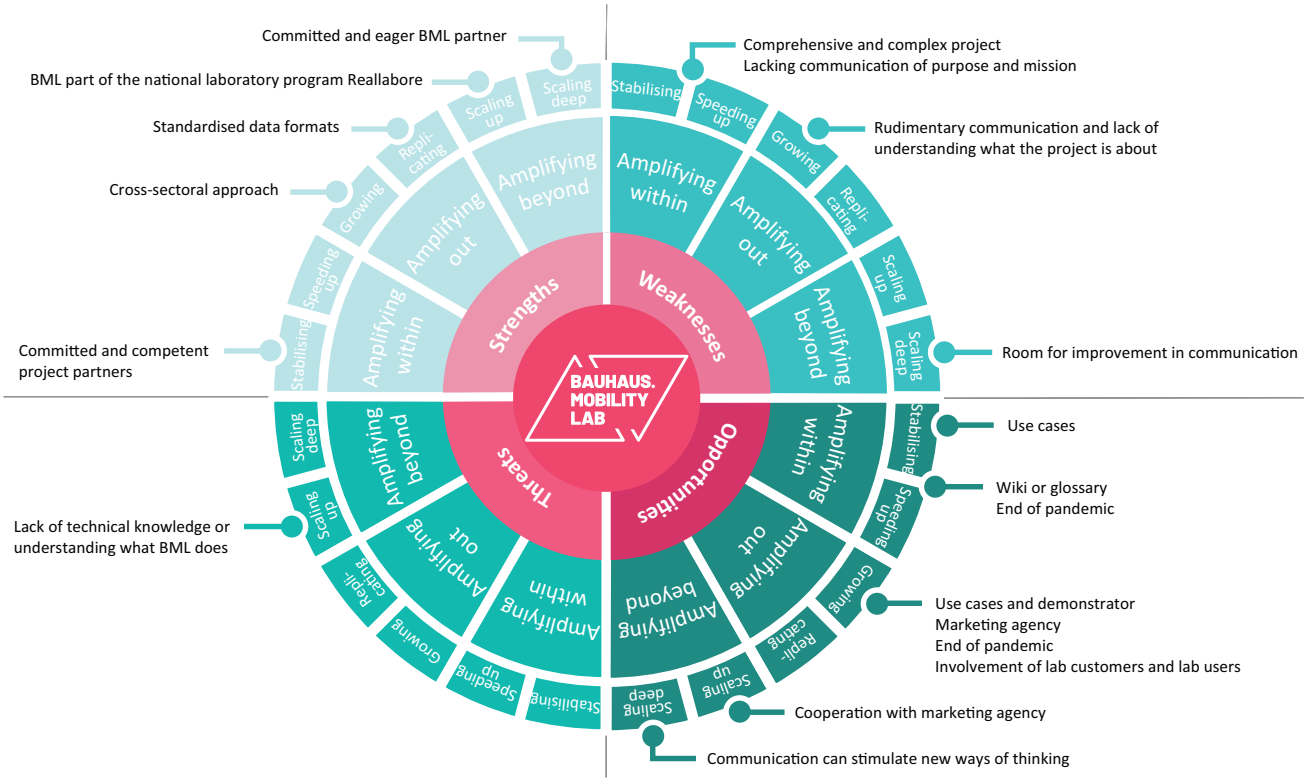

Figure 2. Repeatedly mentioned and common denominators of amplification processes in the BML according to Lam et al.'s (2020) "typology of amplification processes." Identified processes were assigned to SWOT.

that promise scaling potential of experimental knowledge. The concrete extent of the potential should be investigated in a follow-up study. The most relevant findings using the example of the BML are summarised below.

The literature suggests that spatial dimension plays a central role in the scaling potential of experimental knowledge (Kern & Haupt, 2021). The study of the BML shows that Erfurt, as a prototypical large European city, promises scaling potential. There are many cities in Germany and Europe that, like Erfurt, have a similar size, building structure, number of inhabitants, etc. (see Section 4). This suggests that experiments carried out in the BML can also be implemented in other similar contexts. A city such as Berlin and London, on the other hand, is very unique, which is why context-dependent parameters need to be considered more closely. Furthermore, the BML is to be sustained in the medium and long term based on the "lab as a service" concept. This means that companies and initiatives can use the laboratory infrastructure, consisting of the AI-lab platform and the RWL, to test and further develop their products and services. Therefore, an operating model is being developed to ensure the operation of the BML beyond the funding period of three years. The literature review also shows that urban transformation requires the institutionalisation of RWEs. This can be achieved by translating experimental knowledge into policies. Since the BML is still in the implementation phase, the concrete translation of experimental knowledge into policies cannot yet be investigated. However, the BML fulfils important prerequisites, as the analysis shows. For instance, the BML is part of the national RWL programme and thus has an exemplary role. In addition, the locally present and Europe-wide networked partner alliance promotes the BML in business, politics, and science (BML, 2021) and thus allows direct access to educational institutions and political lobbies.

4.4. Delimitations and Considerations

As mentioned, the BML is still being implemented, which is why the study is only a snapshot and not a conclusive analysis. Therefore, the focus also lies on how experimental knowledge is produced in the BML based on the organisation, structure, and characteristics of the real-world lab, and how it reflects on the scaling potential of experimental knowledge. In the next step, a follow-up study is necessary to analyse what kind of experimental knowledge is produced to conclude the scaling potential. Although the implementation of the BML was at an early stage during this study (status June 2021), it makes sense to deal with scaling processes at an early stage, as possible obstacles or barriers can be uncovered and optimisations are made. This also corresponds to the iterative character and process of RWEs.

Furthermore, it is necessary to consider the circumstances of the current pandemic, which are affecting the BML structure, organisation, and communication and in turn the scaling potential of experimental knowledge.

5. Conclusion

Ultimately, it is unclear how RWLs contribute to urban transformation, as there is a lack of theoretical and empirical evidence on the relationship between RWLs and urban planning (Kern & Haupt, 2021; Räuchle, 2021b; von Wirth et al., 2019; Voytenko et al., 2016). Nonetheless, RWLs are argued to transform cities by promoting solution-oriented cooperation and actively contributing to a social change towards more sustainability (Alcántara et al., 2018). Kern and Haupt (2021) indicate that this urban transformation requires scaling of experimental knowledge, meaning that the knowledge must go beyond the level of a building, street, or small district where RWEs are conducted (Dijk et al., 2018). However, the literature review shows that it seems rather elusive how the scaling of experimental knowledge can be approached. Therefore, this study applied the "typology of amplification processes" by Lam et al. (2020) to the case of the BML as an approach to identify and systematise the scaling potential of experimental knowledge from RWLs. To accommodate the research question, i.e., how does the "typology of amplification processes" by Lam et al. (2020) contribute to identifying, systematising, and evaluating the potential of scaling experimental knowledge of RWLs, the amplification processes are summarised in a SWOT analysis, which allows evaluating the scaling potential.

Overall, most processes were identified in the *amplifying within* category ("stabilising" and "speeding up"). This is because the analysis took place during the setup and first implementation of the BML. A strong and active network shows that scaling up processes are in place ("growing"). In addition, the BML is part of the national real-world lab programme "Reallabore—Testräume für Innovation und Regulierung," which ensures the link to higher institutional levels ("scaling up"). "Scaling deep" processes take place in the sense that the BML is involved in teaching and thus is fostering new mindsets and changes of values. Furthermore, the strong commitment of all BML partners suggests that there is a desire for fundamental change and regime shift. The only processes that were not identified in line with the "typology of amplification processes" (Lam et al., 2020) are "transferring" and "spreading." The BML AI-lab platform acts as a common denominator to promote amplifying processes and, therefore, the BML does not aim for independent amplification processes. The evaluation of amplification processes shows that strengths or opportunities may also be considered weaknesses or threats, i.e., the cross-sectoral approach. However, opportunities provide possible approaches to overcome these weaknesses or threats.

The analysis proves that the "typology of amplification processes" is useful to identify and systematise the

scaling potential of experimental knowledge of RWEs. Further, an early engagement with scaling potential makes sense when possible obstacles or barriers can be identified and improvements made. This is in line with the iterative character of RWLs to constantly rethink and, if necessary, refine the organisation and implementation of RWEs. However, a deeper examination of different methodological approaches to scaling experimental knowledge from RWLs is needed.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Evidence-Based Planning: A Multi-Criteria Index for Identifying Vacant Properties in Large Urban Centres

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Abstract
Attempts to avoid property vacancy represent an immense challenge for local authorities and planning policy design. Despite recent normative and regulatory advances witnessed in the recent past with the recognition of the social function of the property by the federal constitution (1988) and statutory instruments included in the city statute (2001) and local master plans, Brazilian cities still experience difficulty in producing evidence-based indicators to support the implementation of progressive planning policies. This article offers a methodological approach using a multi-criteria index to identify vacancy propensity levels in the central area of São Paulo. The research results from a partnership between the municipal authority and two planning laboratories from public universities and financial support from UNESCO. The index was designed using a multi-criteria decision aid technique, PROMETHEE II. The proposed methodology involved the manipulation of eight variables related to the vacancy phenomenon and a two-phased validation process: one quantitative using statistical tests and the second qualitative through the scrutiny of the index by urban specialists. The result represents the potential vacancy levels for 3,254 urban blocks and their spatial distribution. For the 344 blocks inspected through fieldwork, 619 potential vacant properties were identified. The development and analysis of the index show that this approach provides valuable information on vacancy levels accounting for its spatial distribution. The index is a flexible tool that can absorb particular local conditions and support evidence-based policy-making.

Keywords
evidence-based planning; multi-criteria index; property vacancy; São Paulo; territorial planning; urban centres

Issue
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1. Introduction

Local and supra-local government administrations worldwide have more recently invested in human and technological resources to survey, identify, and build vacant property inventories for their urban centres. Reasons for addressing urban vacancy vary greatly and may include increasing the supply of land for housing construction, unlocking urban regeneration projects through the provision of urban infrastructure and services, estimating the economic value (or loss) caused by obsolete built stock, and others. In common, these experiences share some key practical challenges. The lack of a universal definition of what constitutes property vacancy, the scarcity of methods and strategies to identify those properties efficiently, as well as the difficulties in managing the vacant stock and enforcing (re)use can be listed as some of these main obstacles acting as impediments to the effectiveness of public policy to combat vacancy.

In order to provide a contribution to this challenge, the article offers a methodological approach for identifying unutilised properties in central urban areas, using São Paulo, in Brazil, as practical experience. The city, one of the largest in population, has

achieved significant progress in addressing the issue in the recent past, both conceptually and normatively. Notwithstanding, there is still a need to develop more effective ways to locate these properties in dense areas. To this end, the São Paulo City Hall in partnership with the UNESCO office, and two laboratories in territorial planning from two public universities—LabHab (Laboratório de Habitação e Assentamentos Humanos from the School of Architecture and Urbanism of the University of São Paulo) and LEPUR (Laboratório de Estudos e Projetos Urbanos e Regionais from the Federal University of ABC)—were involved in the conceptualization of a multi-criteria vacant index (índice multicritério de ociosidade [IMO]) that shall be presented herein.

Traditionally, vacancy in urban areas has accrued more profusely old industrial sites (Ball, 1999, 2002; Walljes & Ball, 1997). Following macroeconomic restructuring movements, large cities have faced a shift pushing industrial activity away and becoming increasingly commerce- and service-driven since the 20th century (Dunse & Jones, 2005; Ferm & Jones, 2015), leaving behind a trace of easily recognisable and identifiable brownfield sites as a result (Grimski & Ferber, 2001). Nonetheless, the industrial decline does not respond solely to the total stock of vacant properties. The weakening of local economic forces, leading to the reduction of businesses and increase in unemployment, changes in the geography of businesses and government headquarters promoted by large urban regeneration projects, or even the oversupply of newly built property can also be treated as causes behind existing vacancy levels.

Besides different levels of welfare losses, land and building vacancy mutually lead to and are led by the inefficiency of urban systems (Owen & Thirsk, 1974). On one end, undeveloped or obsolete land and property located in well-serviced areas can be associated with increasing costs for expanding infrastructure investments in peripheral regions and soaring transportation costs to commute across cities. On the other hand, speculative behaviour of landowners and developers and a lack of investment in conservation policies are suggested to be driving forces behind vacancy levels and can cause market failures.

More widely, the academic literature and planning institutions see property vacancy as an obstruction to promoting equitable and efficient cities. The equity aspect is related to the fact that, increasingly, cities have been accumulating an estimated vacant built stock higher than the estimated homeless population (Habitat for Humanity, 2021; Neate, 2014). The efficiency element is related to the sustainability of public expenditures, i.e., the presence of obsolete properties in serviced areas means that ultimately, public resources invested in the past are not being exploited at their full capacity (Matsumura, 2011; Robinson & Torvik, 2005).

Due to the complex nature of the phenomenon, planning practitioners and scholars have also struggled to develop practical and effective ways to identify vacant buildings (Trigo, 2020). There is no consensus on what constitutes property vacancy either in its terminology (derelict, idleness, emptiness, obsolete, under-utilized) or the classification parameters to be employed (e.g., the location, conservation status, time in obsolescence or proprietorship; Home, 1983). Some recent experiences have focused on surveying brownfield areas and vacant land (see Ferber et al., 2006; Foley et al., 2021; Grimski et al., 2012; Newman et al., 2016; Myers & Wyatt, 2004). The authors agree that, despite the lack of definition for these types of properties, their magnitude and the extension of land they cover as well as their intrinsic physical and structural characteristics make them easy to recognise. Nonetheless, these sites respond for just a proportion of the total empty stock. On the other hand, vacant building inventories have been proven particularly challenging to create due to the wide range of property types that can be classified as such (Kohler & Hassler, 2002; Kohler et al., 2009; Thomsen et al., 2011). The nature of this type of property demands an identification strategy that inevitably relies on a clear definition of the term. Moreover, the literature also highlights that such a definition should consider the distinction between short- and long-term vacancy (Buitelaar et al., 2021; Wyatt, 2008), its spatial distribution, building types, and tenure regime (Huuhka, 2016).

Empirical and theoretical strategies to tackle the issue have emphasised, predominantly, both the underlying socio-economic motives driving the proliferation of vacancy and their implications and potential policy responses to the rehabilitation of the sites (Adams et al., 2010; Bardos et al., 2016; Tzoumis & Driehorst, 2016). However, the literature review conducted for this study has found somewhat fragmented examples of specific studies and projects aiming at creating techniques that allow for the strict identification of sites and buildings, with a clear proposition for the construction of inventories. Drake et al. (2016), for example, have proposed the development of a smartphone GIS survey tool to be used by university and community members to register vacant buildings in Trenton, New Jersey. The study highlights the importance of current strategies to combine data collection tools with spatial analysis and reiterates the relevance of developing comprehensive fieldwork to confirm vacancy status. Nevertheless, it is heavily reliant on volunteer users' interaction, lacking a more systematic and spatially widespread approach.

Given the pressing significance of the topic and the presented gaps in research and policy-making strategies to combat urban vacancy, this article aims to provide a methodology for an instrumental technique to help local governments build vacant property inventories at the intra-urban scale. The choice of the city of São Paulo as a concrete case for exploration is associated with a set of normative and regulatory advances promoted both at the national and municipal level in the recent past, which ultimately overcome the initial barriers indicated by the literature, for instance, with a set definition for property vacancy. The city, currently the 11th largest urban

agglomeration in the world, its economic relevance—nationally and in the Global South—and its legacy as being at the forefront of planning strategies in the country reinforce the choice. In addition to this introduction, where some of the main concerns regarding the identification of vacant buildings are presented, Sections 2 and 3 provide a brief introduction to the Brazilian regulatory context and the study area, respectively. Section 4 describes the methodological design behind the construction of the IMO. Finally, Section 5 provides the main results from the implementation of IMO, and Section 6 provides some concluding remarks.

2. A Brief Overview of São Paulo's Experience

Over the past three decades, Brazil has promoted important juridical and regulatory milestones while consolidating a set of norms and legislation on urban policy at the federal level. It began with the country's latest federal constitution, approved and enacted in 1988 after the end of the military dictatorship that ruled the country for 21 years. This was following a series of intense rounds of discussions and negotiations amongst various society groups during the Constituent Assembly between 1986 and 1987. The new constitutional law established a new juridical foundation for the legal understanding of land ownership regimes, officially represented by the detachment of building rights from the exercise of property ownership (Fernandes, 2007, 2014). The new designation is underpinned by the concept of the social function of the property (SFP), through which private property rights are protected subject to collective interests (Friendly, 2020). In other words, the SFP implies that private proprietorship's social and collective benefits must prevail. Pragmatically, such a right is exercised through the concession of building rights (negotiated using building rights levy payments) and through the control of vacant properties in urban areas. Both controls are coordinated and implemented by the municipal authority according to specific regulation defined by the city's Master Plan.

Based on the principle of the SFP, 13 years later, a national framework for urban development was enacted—the city statute (Federal Law N. 10.257/2001). The framework offers municipal governments an array of statutory planning instruments to feature within their local planning regulations and guidelines to support the SFP's fulfilment. The definition of what constitutes the social function and choice for which set of instruments to be implemented are defined in the local master plan and the zoning ordinance. In particular, amongst these instruments stands out the compulsory parcelling, building, and utilisation of land (*Parcelamento, Edificação e Utilização Compulsórios* [PEUC]), explicitly conceived to control, avoid, and give use to vacant urban properties. To implement PEUC, municipal authorities must identify and notify landowners of vacant and obsolete sites, enforcing the re-establishment of land use consistent with the existing local provision of infrastructure and amenities. For instance, in central areas, given their historical pattern of concentrating public investment and diversity of land uses, vacancy can be interpreted as a loss of efficiency and resources.

Having proprietors not taken any action in the first year after the notification, progressive taxation incurs during the following five years. Lastly, PEUC allows the public authority to expropriate the site under public debt claims if the property remains vacant. To be notified, the property must fall within one of the three classifications of vacancy: unbuilt, underused, and unutilised properties, which are always defined by local regulation. In its current version, the city's Mater Plan (Municipal Law N. 16050/2014) defines these three categories as follows: *unbuilt*—properties larger than 500 sqm, in which the floor area ratio used equals zero; *underused*—properties larger than 500 sqm, in which the floor area ratio used is lower than the required minimum; *unutilised*—buildings and other properties with at least 60% of its built area vacant for more than one year.

In São Paulo, PEUC was first incorporated in 2002 in the city's planning regulation and revised in 2014. In its most recent implementation experience, since 2014, the municipal administration has allocated institutional and personnel resources devoted to the notification of vacant properties in specific perimeters across the city, resulting in approximately 1,400 official notifications between 2014 and 2019 (Figure 1). The strategy focused mainly on obsolete sites located within urban redevelopment projects perimeters in the central area, the historical centre, as well as in inclusionary zoning districts. After this first round of notifications, a concrete issue emerged from the fact that an updated inventory of vacant properties in the city was inexistent, decelerating the flow of notifications. This presents a policy deadlock whereby a well-defined regulatory framework aiming to promote the SFP encounters practical impediments to its effectiveness. On the other hand, this scenario also highlights opportunities for local governments to invest in mechanisms and strategies using existing resources, which can facilitate the implementation of progressive planning policies. In the instance explored herein, the availability of an extensive set of spatial data and property information, combined with interdisciplinary expertise and the existence of clear property ownership regimes, allows for the development of effective evidence-based methodologies to identify vacant stocks in urban areas.

This study, therefore, offers one relevant contribution in the attempt to improve the implementation of one particular planning policy that tackles property vacancy in urban centres by using existing empirical evidence—a multi-criteria index— that can map out and help to identify vacancy in urban areas, based on well-defined parameters and existing datasets. Such an approach aligns with the idea that data has never been as widely available as it currently is, placing data analysis proficiencies at the centre of policymaking. This

also represents a praxis experience reinforcing Faludi and Waterhout's (2006) view of an evidence-based turn in planning whereby a set of evidence (data and information) is collected and used within the planning process and emphasises more pragmatic rather than ideological (Davoudi, 2006) form of governing.

3. The Study Area

The chosen study area for this methodology covers the central part of the São Paulo municipality and its metropolitan region. The city's administrative limits are divided into sub-prefectures, each of those divided again into districts. In total, there are 32 sub-prefectures, summing up 96 districts. The study area where this study was implemented correspond to two sub-prefectures: Sé (formed by the districts of Bela Vista, Bom Retiro, Cambuci, Consolação, Liberdade, República, Santa Cecília, and Sé) and Mooca (and its districts of Água Rasa, Belém, Brás, Mooca, Pari, and Tatuapé districts). The perimeter also includes the Água Branca district (pertaining to the Lapa sub-prefecture). Essentially, it is a diverse and heterogeneous area that contains a wealth of infrastructure hubs and services, a high concentration of jobs and dwellings, old industrial districts along the river margins, and an assortment of buildings of historical and cultural relevance.

With 6,635 hectares and approximately 220,000 dwellings, the country's last census informs that nearly 800,000 residents lived in this region in 2010 (Instituto Brasileiro de Geografia e Estatística [IBGE], 2011). The area also hosts several urban regeneration projects, such as the Água Branca Urban Operation, the Central Urban Operation, and the Central urban intervention projects. Due to this diversity, urban fabric patterns change considerably from district to district within the study area, demonstrating the diversity of existing building typologies in the area. This provides initial evidence of the type of vacancy expected to be found in each district. Below, Figure 1 depicts some of the aforementioned urban projects, the special social interest zones, and the PEUC notified properties. Even though there is an overlap in the study perimeter and the bulk notification, it is essential to remind that the municipal strategy in applying PEUC focuses mainly on the city's central areas. Figure 2 shows the study area and its administrative subdivisions.

4. The Multi-Criteria Vacant Index – IMO

As explored previously, one of the main challenges in tackling vacant properties and speculative land retention is identifying the phenomenon's spatial distribution. The IMO may be one available alternative to this end. It consists of an index able to capture the various aspects related to vacancy and provides an instrumental tool that informs the propensity of the presence of vacant buildings at an intra-urban scale. In this study, the IMO concentrates on the identification of unutilised buildings.

The decision to develop the IMO is based on two premises: the first is that the index should be conceived

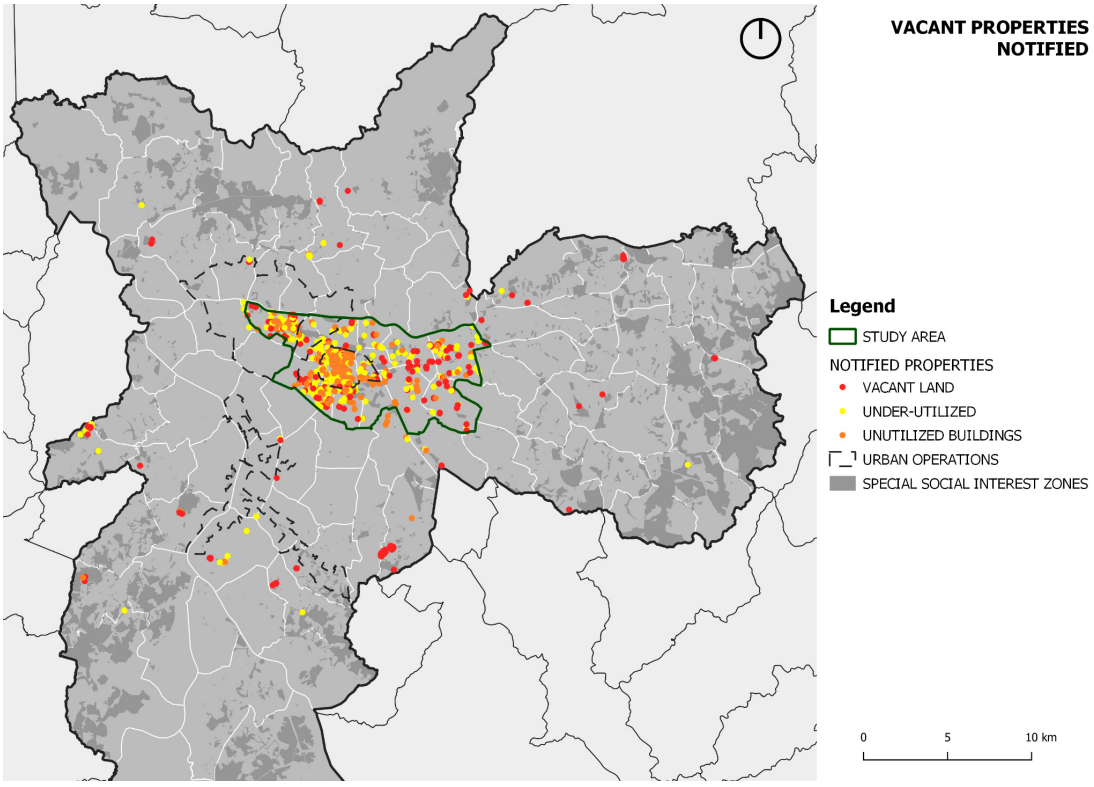


Figure 1. Distribution of vacant properties notified for PEUC purposes in the city of São Paulo between 2014 and 2019. Source: City of São Paulo (2021).

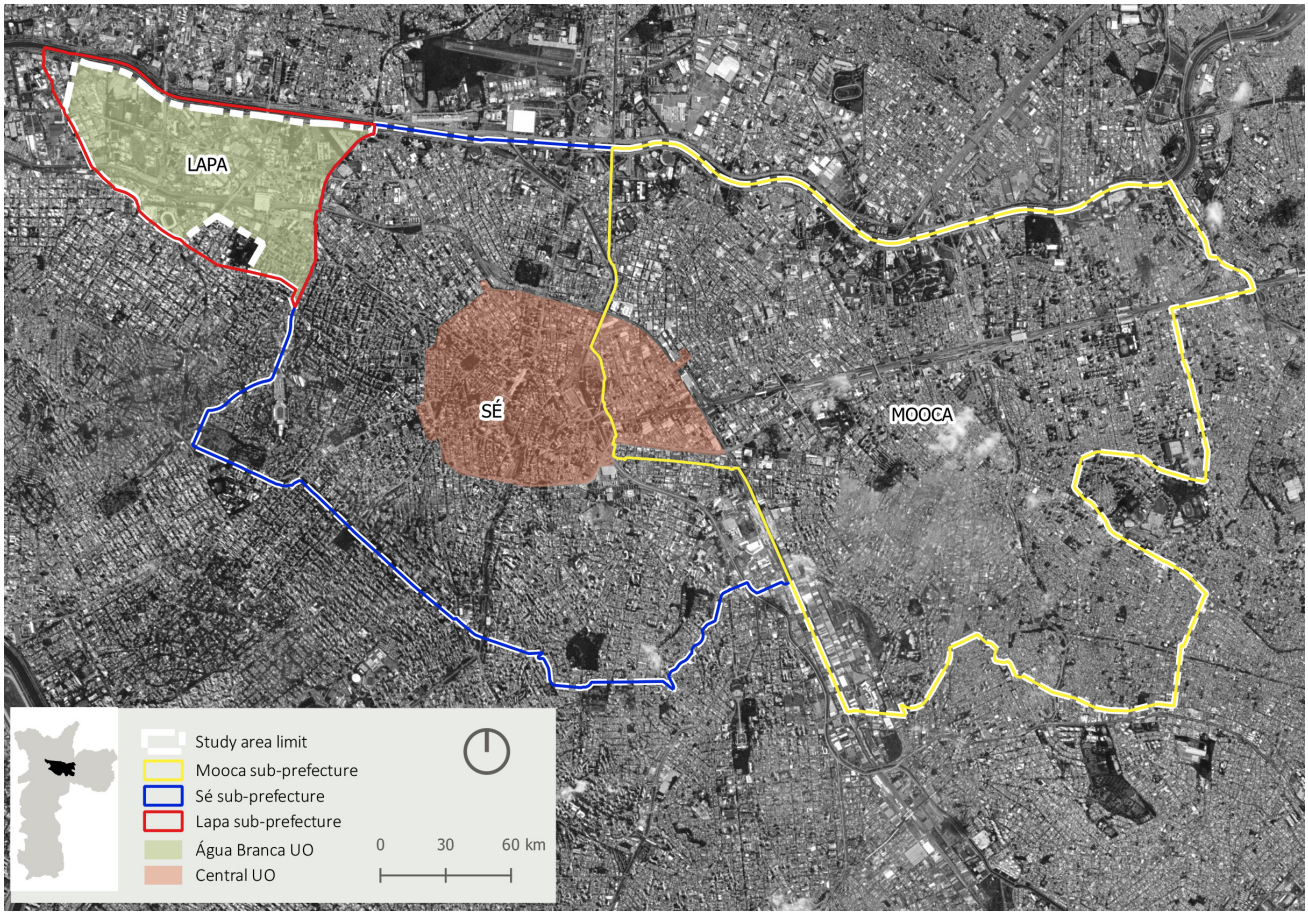


Figure 2. Study area in the central region of São Paulo.

as a tool that allows working with the complexity and diversity of vacant properties, which ultimately requires a multitude of indicators that can capture the various causes behind vacancy and its many forms of manifestation. Secondly, the index results can aggregate different knowledge, perceptions, and experiences in one single instrument. Once observed in the development of the IMO, these two premises facilitate the communication of outcomes in an effective and simple form that can supply public policy formulation and implementation. These premises shall be explored in more detail in the following subsections.

4.1. The Multi-Criteria Vacant Index and Its Variables: Working With Multidimensional Vacancy

One of the advantages of working with indices is the possibility of aggregating different dimensions of an object or phenomenon into a single instrument (Nardo et al., 2005; Wong, 2006). Given the complexity and the nature of the vacancy phenomenon, as well as the lack of methodologies focused on its identification, capturing its manifestation directly can be considerably difficult and burdensome—for example, conducting city-wide on-site inspections. Therefore, observing it through its different indicative signs, by using available secondary data, is a form of unifying available information in a timely and financially efficient form. This evokes a multidimensional perspective to looking at vacancy, whereby using an index is an appropriate resource.

Notwithstanding, despite the benefits a tool like an index can bring, such as the richness and diversity of representation forms, this methodological approach presents at least two caveats that are worth mentioning: firstly, the choice of the variables—or the index's dimensions—that should be taken as proxies for the representation of the phenomenon, i.e., there must be theoretical reasoning behind the definition of variables, and their limitations must be explicit; secondly, the level of the relationship among these variables. The index will represent the interactions amongst the chosen variables.

Addressing the first issue involves selecting variables that can correctly represent the phenomenon of interest. This is crucial because it defines the index horizon whereby the selected variables posit what the index will be able to capture and convey. They are the index's looking glass. In the IMO case, after extensive exploration, eight different databases were investigated, spatialised, and analysed (Table 1). They have been selected considering their theoretical relationship with vacancy, spatial coverage, temporal scales, and accessibility. Although potentially interesting, some variables selected at the

Table 1. List of variables employed in the index.

Variable (Database/Institution)	Year	Description
Water supply (Sabesp/service concessionaire)	2020	Connections that had their service supply contract terminated or that were permanently excluded from the supply network for at least one year
Dengue outbreak reports (Sistema de Controle do Zoonoses/São Paulo Municipality)	2020	Properties classified as abandoned or unoccupied by agents who carried out property inspections with reports of standing water and/or dengue outbreaks
SP156 complaints (Secretaria Municipal de Inovação e Tecnologia/São Paulo Municipality)	2020	Complaints related to the presence of waste, rubble, and physical degradation of the property and its immediate surroundings
Active fiscal debt (Property Tax System [IPTU]/São Paulo Municipality)	2020	Properties listed in the active IPTU debt register of the Municipal Attorney General's Office
Vacancy rate (IBGE/federal agency)	2010	Measurement of vacant properties obtained from the 2010 census
Overcrowded dwellings (HabitaSAMPA/ São Paulo Municipality)	2010–2019	Reports of properties classified according to the degradation status of housing conditions
Real estate launches (EMBRAESP/consulting company)	2020	The number of new approved residential development schemes used to identify areas with low construction dynamics
Paulista social vulnerability index—IPVS (Seade/São Paulo's state agency)	2010	Characterisation of the living conditions of population groups, with emphasis on social vulnerability

beginning of the study had to be excluded (such as piped gas and electricity consumption by household) due to the impossibility of the data to conform to any of the three prerequisites above.

After the variable's selection, the resulting data set underwent extensive management to filter observations in the study area, select and transform unities of analysis, and run spatial aggregation so each variable could be represented in the urban block scale (hereafter referred to as blocks)—the most appropriate intra-urban scale for the IMO. The analysis of each variable aimed at exploring and understanding their individual characteristics, such as spatial distribution and variability before aggregation into the index. The results are shown in Figure 3. The illustration shows, for each variable, the aggregation of observations in terms of dwellings per block, except the *vacancy rate* that is shown in proportional terms (empty properties per the total of properties in each census block) and the Paulista social vulnerability index, which is an index varying from 1 to 5 (from *low vulnerability* to *high vulnerability areas*).

The internal relationship amongst variables was statistically investigated. Pearson's correlation matrix indicates no strong correlation between any particular pair of variables. It was found that the highest correlation was between dengue outbreak reports (SISCOZ) and active debt (IPTU) data—0.3. The second highest value is 0.29 (water supply and dengue outbreak reports). The remaining correlations stay between 0 and 0.2, indicating that the chances of two variables covering similar aspects are considerably low, corroborating their inclusion in the index.

4.2. Variables and Scenarios: Integrating and Evaluating the Formulation of the IMO

The conceptualization of the IMO's structure consisted initially in the definition of the extent to which each variable contributes to the index considering their theoretical reasoning to the phenomenon and, subsequently, in the actual integration process through the chosen statistical method.

As aforementioned, each variable contributes differently to the representation of vacancy. Thus, expressing their intrinsic capacity to measure one particular aspect (or manifestation) of property vacancy and their potential overall contribution to the aggregate index is essential. For the latter, a group of 22 planning specialists, 11 from the São Paulo Municipal Authority and 11 from universities and research laboratories—LabHab and LEPUR—answered one questionnaire ranking the relevance of each of the eight variables in reporting vacancy. The goal was not only to capture the various perspectives from different data sources but also to integrate into the methodology an interdisciplinary interpretation of the phenomenon. With values varying from zero (absolute

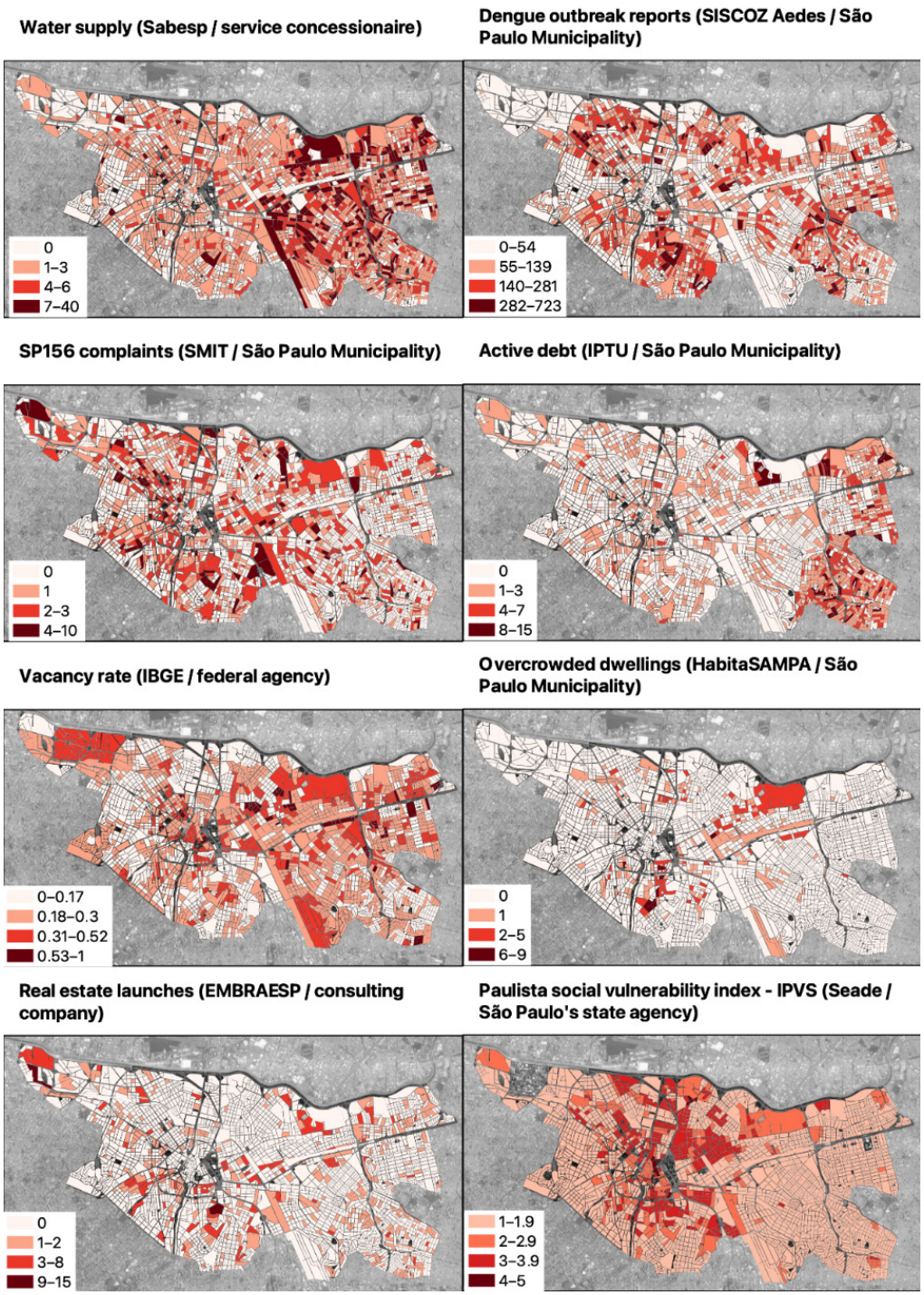


Figure 3. Spatial distribution of primary variables for the index.

irrelevant) to four (the most relevant), the questionnaire aimed at ranking from least to most relevant the weight of each variable within the index. The weight, therefore, was defined by the mean value of the 22 responses to each variable. The final weights are shown in Table 2.

The weighting of variables completed the preparatory steps for the index calculation. The following phase consisted in combining and integrating all the variables into IMO. In this study, it was decided to employ a multi-criteria decision analysis technique, which accounts for the variety of variables used and the number of specialists consulted. More specifically, it was decided to use the preference ranking organisation method for enriched evaluation (PROMETHEE II).

Classified as a method that responds to ranking issues, PROMETHEE II allocates decision-makers at the centre of the analyses (Ishizaka & Nemery, 2013, p. 2). Aiming at consensual solutions, the technique seeks not the best but a satisfying arrangement amongst stakeholders (Januzzi, 2017; Januzzi et al., 2009). Furthermore, the

Table 2. Distribution of variables' weights according to questionnaire responses.

Selected variables	Weight distribution (questionnaire responses)					Mean
	0	1	2	3	4	
Water supply (Sabesp/service concessionaire)	—	—	—	2	20	3.91
Dengue outbreak reports (SISCOZ Aedes/São Paulo Municipality)	—	—	2	8	12	3.45
SP156 complaints (Secretaria Municipal de Inovação e Tecnologia/ São Paulo Municipality)	—	3	8	8	3	2.50
Active debt (IPTU/São Paulo Municipality)	—	6	8	5	3	2.23
Vacancy rate (IBGE/federal agency)	2	6	10	4	—	1.73
Overcrowded dwellings (HabitaSAMPA/São Paulo Municipality)	2	10	8	2	—	1.45
Real estate launches (EMBRAESP/consulting company)	4	9	6	3	—	1.36
Paulista social vulnerability index—IPVS (Seade/São Paulo's state agency)	6	10	5	1	—	1.05

choice for this method is based on its flexibility, the possibility to join different agents and experiences in the decision process, and the evaluation of distinct scenarios. With this, the relationship and possible gaps between evidence and action or diagnosis and decision-making process—an essential and not always well-defined issue (Faludi & Waterhout, 2006, pp. 8–9)—may be incorporated and expressed into the IMO's results.

The method was used to rank all the 3,254 blocks in the study area according to their estimated vacancy propensity. Implemented by the PRADIN software, two main parameters had to be set: the variables' weights and the participants' weights. For the former, the overall mean for each variable after the questionnaire application was adopted. For the latter, it was decided that all respondents would receive the same weight due to their varied but equally relevant experience with the topic. With this, the index acknowledges the diversity in knowledge and distinctiveness in the professional perception of all participants. Therefore, based on the defined preferences and the characteristics of the blocks in the city's central area, PROMETHEE II makes a pairwise comparison between the blocks within the study area and creates a ranking. The result is a set of ordered blocks considering the estimated propensity of vacant properties to existing.

Considering that one of the goals is to make the IMO easily applicable and interpretable to other realities, the final ordered results were classified into three propensity groups using Jenk's (1967) natural breaks method, which aims to minimise the differences between data in the same class and maximise the difference between classes. These classes of the IMO were defined as *low to medium*, *high*, and *very high* propensity.

To improve the design of the IMO, the initial results were submitted to the scrutiny of a second group of specialists that included 11 managers and planning practitioners from the municipal authority, 11 experts from the University of São Paulo and the Federal University of ABC, 10 members from the work team, and four external guests. They were invited to a workshop to discuss alternative scenarios for constructing the IMO and its outcomes. The workshop was conceived as a moment to qualitatively explore and validate different aspects of IMO, its conceptualisation, the variables selection, and its spatial distribution. The discussion led to the development of two different scenarios for the IMO: one that includes all eight variables and the other with two variables ranked highest. The main goal was to evaluate which index formulation would be the most appropriate. The discussion involved questions and comments related to the reproducibility of the proposed index, the possibilities for extrapolation into other regions of the city, and the need for adjustments or analysis by the index components.

The index using all the eight variables was chosen from two scenarios presented in the workshop. This choice underpins the phenomenon's complexity and the absence, to date, of a systematic multi-criteria methodology to identify vacant properties. The results with the IMO estimation are shown and commented on in Section 5.

4.3. Implementation and Statistical Validation

The IMO's results were also submitted to statistical validation. The process verifies whether the index estimates correctly represent the phenomenon of interest—property vacancy. The idea is simple: comparing the estimates produced by the index, i.e., the three propensity classes of vacancy, against a scenario of reference deemed correct (i.e., verified vacant properties in the study area). To this end, the collecting data on existing vacant properties was necessary. Thus, a sampling inspection strategy had to occur as a project development phase. A key requisite at this stage was that enough

data could be collected to allow statistical and spatial validation of the index.

To define the sampling blocks, two main aspects were considered. The first is related to the possibility of making inferences about vacancy in the entire study area (internal validation), quantifying the associated errors and successes. The sample was then calculated using probabilistic techniques. Another key aspect was the spatial dimension, considered one of the IMO's cornerstones, as the territory matters. Thus, spatial dynamics, patterns, and specificities were considered during the validation process. These conditions drove the adoption of a stratified sampling strategy by city districts. The final sample consisted of 344 blocks randomly divided across all districts.

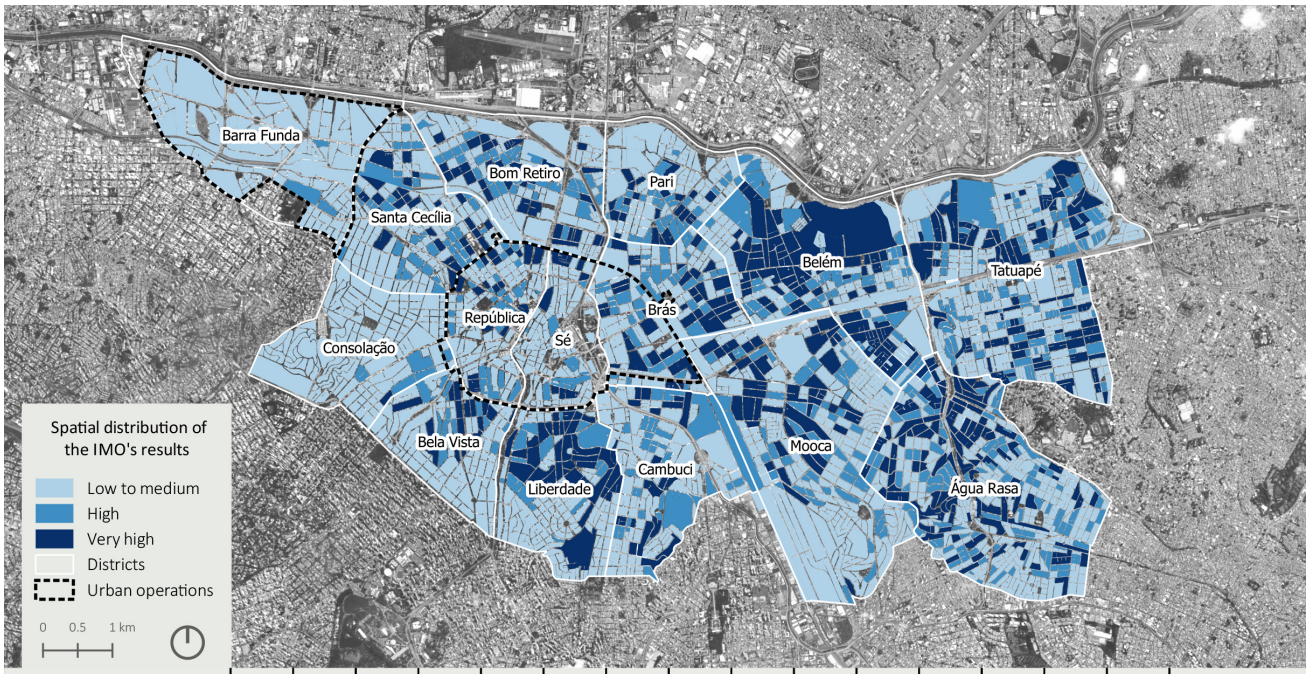
Statistical sampling strategies and techniques were employed to validate the index once the necessary premises and criteria were observed, which gives validity to the test results (Lohr, 2021, p. 15). Considering the nature and type of the data, different non-parametric correlation tests were computed. Here, the results of Spearman and Kruskal-Wallis were applied. Whilst the first one measured the association between the data collected in the field (observed data) and index estimates (estimated data), the second one evaluated how consistent the index classes are. The results are presented in the following section.

5. Results: Notes on the IMO's Estimates and Its Statistical Validation

The spatial distribution of the IMO's propensity levels is represented in Figure 4. The map depicts the propensity of each block in the study area to present at least one vacant property based on the combination of indicators in the index.

The IMO's results allow for a series of notes on how the propensity of vacancy is distributed in the study area. First, when considering the entire perimeter of the study, the two classes *High* and *Very high* combined estimate that 35% (1,140 blocks) of all blocks have at least one vacant property. This figure, however, does not seem to be uniformly distributed across the study area, with a seeming concentration in the eastern region.

Secondly, and correlated to the first note, the results across the Mooca sub-prefecture stand out when considering the sub-prefecture level. The *Very high* vacancy class individually corresponds to 71% of the blocks (262 blocks). Whereas for the Sé sub-prefecture, the proportion of blocks falling within the same class is only 28.4% (105 blocks). The portion from the Lapa sub-prefecture at the western-most limit of the study area (only its district of Barra Funda) does not include any block classified within the *Very high* class of the IMO.



	Sé	República	Bom Retiro	Santa Cecília	Consolação	Bela Vista	Liberdade	Cambuci	Brás	Pari	Belém	Tatuapé	Mooca	Água Rasa	Barra Funda	
Low to medium	122	111	101	117	146	96	114	113	96	81	123	267	239	274	114	**2,114**
High	15	35	48	56	7	21	34	43	54	34	71	145	69	138	3	**773**
Very high	4	13	26	17	-	13	19	13	22	17	49	63	33	78	-	**367**
Total	**141**	**159**	**175**	**190**	**153**	**130**	**167**	**169**	**172**	**132**	**243**	**475**	**341**	**490**	**117**	

Figure 4. Spatial distribution of IMO's estimates on vacancy propensity.

Narrowing down the analysis to the districts level, by combining the *High* and *Very high* classes together, the Água Rasa (216 blocks), Tatuapé (208 blocks), and Belém (120 blocks) districts are those with the highest absolute numbers of blocks within this classification, while the Barra Funda district remains the district with the lowest indication of vacancy propensity-only—3 blocks in these same classes. The situation slightly changes if the relative numbers are considered (the proportional terms in each district). In this case, the top three districts with the highest levels of propensity vacancy are the ones of Belém (49.4% of its blocks), Brás (44.2%), and Água Rasa (44.1%). In the Barra Funda district, only 2.6% of the blocks are classified in the same range.

Due to its disaggregated spatial resolution, the estimated vacancy propensity can be assessed for other spatial scales, for example, at urban intervention programme levels. The Central Urban Operation has a total of 377 blocks, out of which nearly one quarter (91 blocks or 25.7%) were classified as having a *high* or *very high* probability of at least one vacant property. These different levels of representation of the IMO's results suggest that the instrument allows for different forms and scales of analyses that have the potential to subsidise bespoke policies, projects and actions combating property vacancy by the São Paulo Municipal Authority.

The results from the fieldwork that was undertaken show the distribution of inspected vacant property in a selection of blocks across all districts. The number and distribution of inspected and confirmed vacant properties we considered in the statistical validation of the IMO are displayed in Table 3. From the total of 344 inspected blocks, 130 returned with zero vacant property identified (37.8% of the blocks). For the remainder of inspected blocks—214 blocks— it was found that, at least, one vacant property existed. The distribution of inspected blocks with and without vacant properties by districts is depicted in Figure 5.

Table 3 shows the distribution of 634 vacant properties identified in the 344 sampled blocks—619 by field research and 15 already notified for PEUC by the municipal authority in the past. Observing the distribution of vacant property across the inspected blocks, nearly two-thirds of those (62.2% of blocks) have at least one vacant property. Nearly three-quarters of the sample contains between zero to two confirmed vacant properties, confirming that searching for vacancy in urban areas can be a meticulous and precise job, due to the scattered nature of the phenomenon. At the other extreme, only five blocks have 10 or more vacant properties, i.e., low levels of clustering behaviour inside the blocks.

When the territory is explicitly considered (Figure 5), the bar graph shows that all districts have at least one block with vacant property. In 10 of the 15 districts, the number of blocks with at least one vacant property exceeds the number of blocks where there is no indication of vacancy. The Pari district calls for attention, where 92.9% of the blocks (13 of 14) have at least one vacant property. On the opposite side, Bela Vista registers no signs of vacancy in 71.4% of its visited blocks.

Finally, the two statistical validation tests were applied—Spearman (ρ = 0.5653334, p < 0.0001) and Kruskal-Wallis (χ^2 = 75.555, p < 0.0001)—to confirm the validity with statistical significance of the outcomes from the comparisons between the estimates from the IMO and the sampling strategy. They indicated that the IMO could be considered a relevant tool to represent vacancy levels and guide local authorities' field inspections.

Table 3. Vacant properties identified through fieldwork aggregated by blocks.

Number of vacant properties aggregated by blocks*	Frequency	Proportion (%)
0	130	37.80%
1	80	23.30%
2	42	12.20%
3	31	9.00%
4	22	6.40%
5	9	2.60%
6	8	2.30%
7	8	2.30%
8	8	2.30%
9	1	0.30%
10	2	0.60%
13	1	0.30%
14	1	0.30%
20	1	0.30%
—	**344**	**100%**

Note: * The values used here are the result of the sum between the total of properties identified by the fieldwork survey (619) and the previously vacant properties notified by the municipality in the same blocks (19), making a total of 634.

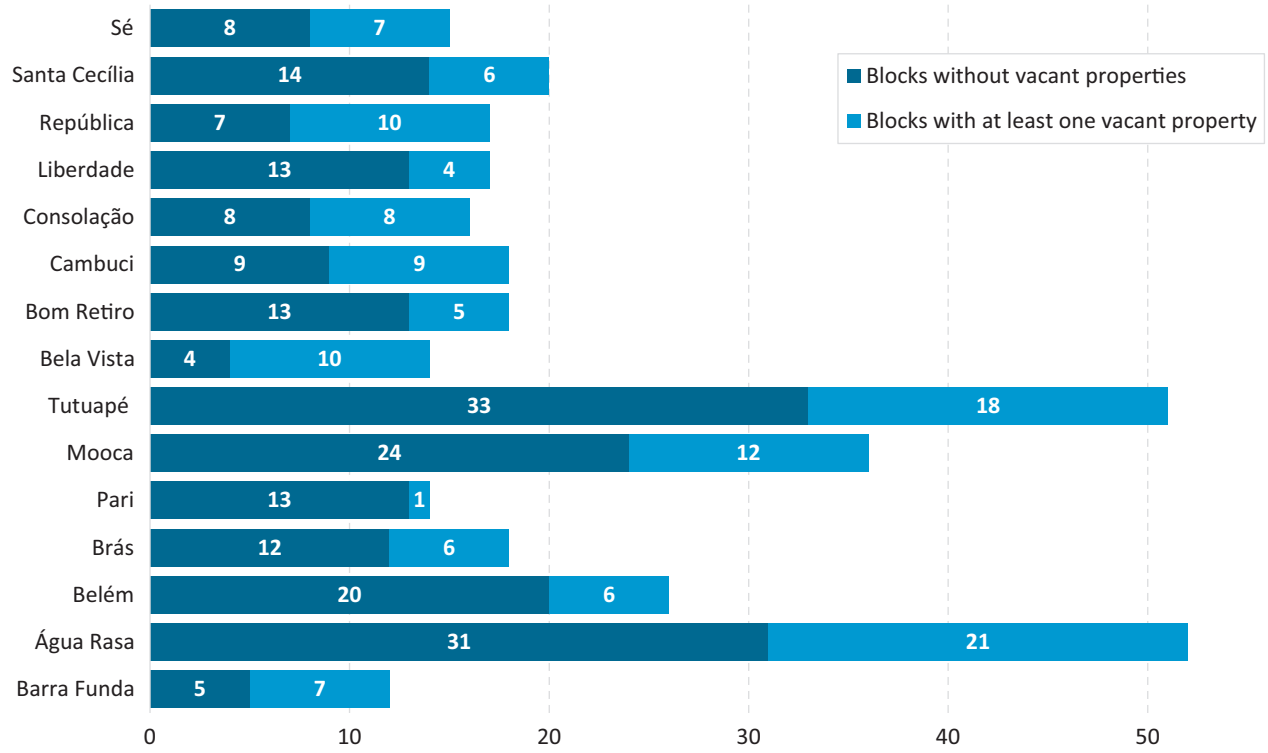


Figure 5. Distribution of blocks with and without vacant properties by district.

6. Conclusion

The main contribution of the IMO, showcased in this study, consists in the development of a known, tested, and referenced empirical strategy to identify and estimate the propensity of vacancy in an intra-urban area. Beyond illustrating the current spatial distribution of the vacancy phenomenon for an empirical case in São Paulo—which is an innovation in itself considering that it is the first time such an approach is implemented in the city—the conceptualisation, implementation, and validation of the proposed IMO demonstrate to be an effective way to aggregate knowledge and disciplines in a coherent form. By offering a better understanding of the various forms of manifestation and spatial distribution of vacancy in São Paulo and bringing new elements to the debate on vacancy from a methodological point of view, even when tangible limitations described are considered, the IMO seems to be an effective and pragmatic tool to supply public policy combating obsolescence in the built stock.

From observing the IMO's structure and composition, the use of different variables supports a more prosperous and more diverse approach to understanding vacancy. In contexts where the scarcity of data on property vacancy is a reality, the IMO can be considered a valid alternative. Not only because the identification process may be more assertive if the chosen variables cover different aspects of vacancy at the appropriate spatial scale, but, equally, the characteristics of the phenomenon and its (different) spatial manifestations are also taken into consideration. Therefore, even though the index has been formulated as a unique instrument for a unique case study, there is an opportunity for its resulting analyses and derived policy strategies to be compared in different contexts using different variables. In the study area, for example, some variables (e.g., active debt or vacancy rate) captured vacancy better in some districts than others, which may indicate a difference in the drivers of vacancy and can express the necessity of specific policies or programs to tackle the issue in a localised way.

These findings align with what has been evidenced by the literature on the topic. For instance, in some American cities, where vacancy is shown to cluster in specific areas (Duke, 2012), the vacancy phenomenon presents differing behaviour and specific dynamics depending on the built environment characteristics and likely causes. This reinforces the understanding that diversity of variables is a better alternative to capture the distribution of vacancy and its dynamics. In other words, subject to instruments like the IMO, it is possible not only to identify where vacant properties are but also to understand the characteristics of the vacant stock and, thus, the implications for the design of public policies, i.e., different vacancy forms require different policy strategies.

Additionally, despite the improvement in access to information on spatial variables seen in recent years, some specific data may still present as a bottleneck for an enhanced design of instruments such as the IMO. Here, data on electricity consumption was initially conceived as a key predictor of vacancy, increasing

the instrument's accuracy considerably. Nevertheless, access to this database required levels of institutional agreement between the municipal authority and the energy supply company, demonstrating that the success of similar strategies is subject to efforts beyond technical and personal resources.

Moreover, the index encompasses a multidimensional approach. Multi-criteria instruments like IMO incorporate different variables, assessment criteria, and professional assessment of the phenomenon of interest, making it a malleable tool to be used conditioned to particular circumstances. For vacancy, as seen with the IMO, this can broaden the identification strategy by adding more aspects beyond the physical characteristics of buildings, such as real estate dynamics and socioeconomic conditions, for example.

The IMO's level of detail is also noteworthy. The spatial scale adopted (by urban blocks) foments intra-urban scale policy implementation, allowing for multi-level analyses, actions, or programs. For the city of São Paulo, it is possible to compare vacancy behaviour by the master plan zones, zoning districts, or urban redevelopment project perimeters, for example. In the case of Brazilian cities, instruments such as the IMO can be associated with other statutory instruments from the city statute to design a more comprehensive strategy to tackle vacancy, involving, beyond the identification and notification, the management and rehabilitation of vacant buildings seeking the fulfilment of the SFP.

Considering the construction of the IMO, the use of PROMETHE II and its search for consensual solutions made it possible to incorporate different actors' views and expertise within the design. Aligned with the evidence-based planning perspective, data availability has played a central role in the development of the IMO. Nevertheless, the definition of which variables must be included, and their weighted roles were based on a diversity of qualitative perspectives and required careful consideration. During the IMO's two workshops, there was a chance to explore and evaluate variables and scenarios, question and test assumptions, and confront distinct points of view that, ultimately, were incorporated into the index in the form of consensual solutions proportionated by the chosen method—more specifically, through the responses to the questionnaire and their relative weights, the even weighting of all participants, and the proposition and assessment of different scenarios. Moreover, recognising the relevance of the process of selecting and evaluating variables and instruments seems to guarantee more transparency to the index and help to bridge the gap between diagnoses and actions.

The possibility of evaluating the results throughout the process and validating the index estimates with fieldwork data and statistical tests must also be noted. Due to the statistical tests applied, IMO's predictive ability was endorsed, showing its real potential and opening possibilities for adjustments and specific tests in due course. Consequently, the IMO could be expanded to the study area as seen from the results and taken as an initial bottom line for other regions in the city.

Finally, considering the index limitations and possible improvements, the following aspects can be highlighted: the impossibility of accessing all the promising variables related to vacancy (such as electric energy); the fact that the external validity of the index to other areas must be considered carefully, checking the necessary adjustments appropriately; the index dependency on constant updates due to dynamic nature of vacancy in urban centres; and the conditional technical knowledge on GIS software and statistical tools to implement the index, skillsets that are not always found in planning departments.

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Conflict of Interests

The authors declare no conflict of interests.

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Article

Rendering Affective Atmospheres: The Visual Construction of Spatial Knowledge About Urban Development Projects

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Abstract
Renderings are digital visualisations of urban development projects in the field of urban design that aim to create spatial knowledge about future-built urban environments, which we also refer to as imaginaries. In our contribution, we ask how visual artists design renderings, how they try to influence spatial knowledge about future urban spaces, and in which processes renderings are produced. Using the cases of the Eko Atlantic City project in Lagos (Nigeria) and the Hudson Yards project in New York City (USA) as examples, it will be shown empirically how specialized visual artists try to make urban development projects appear convincing and appealing. The analyses show that visual artists particularly use design elements such as photorealistic aesthetics and lighting to make the presentations of the planned building projects desirable. They also attempt to make them appear coherent in their built environment by digitally collaging different imaginary elements. Interestingly, only a limited number of image types are used. They can nevertheless put the imaginary space of the planned building projects in a positive light, create pleasant affective atmospheres, and appeal to a wide audience. By visually constructing imaginaries about urban development projects and thus influencing the subjective spatial knowledge of stakeholders and a broader public, renderings develop power. The constructed—and widely shared—imaginary space can guide investment and influence planning processes and the materialization of the built project.

Keywords
digitalization; Lagos; New York; spatial imaginaries; urban design; visualizations

Issue
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1. Introduction

Glass skyscrapers glow at sundown, happy young people are shopping, the traffic is flowing, and the parks are green and bright. In architectural visualization, photorealistic digital images—so-called "renderings"—have become the most prominent way of envisioning future urban spaces (Rose et al., 2014, p. 386). During all stages of the planning processes, these digital (architectural) visualizations are produced in ever-increasing quantities. In this article, we investigate the renderings of two large-scale urban development projects: Hudson Yards in New York (USA) and Eko Atlantic in Lagos (Nigeria). In these projects—as in many others around the world—renderings are used to create positive perceptions of the future-built environment among stakeholders and the broader public.

Renderings are aestheticizing digital visualisations that have become possible in the context of digitalization processes in urban planning and design. They have become increasingly common in the meantime and have changed the way urban development projects are visualized and communicated (see Christmann et al., 2020). To better understand how renderings can influence the

spatial knowledge of stakeholders (such as potential investors, tenants, the public, etc.), it is important to ask how renderings are designed, in which processes they are produced, and how they construct commonly shared visions of the urban future. As they address a wide range of different stakeholders, take into account different levels of reference (e.g., local and global, public and private, etc.), and intend to appeal to and convince viewers of planned urban transformations, these digital images have to fulfil very complex tasks. Furthermore, the production of renderings entails numerous challenges, not only in technical terms (it requires certain digital tools and specialists) but also in economic terms (it is cost-intensive) and political terms (it requires navigating a complex political field with potentially conflicting rationalities). Against this background, a closer analysis of the way renderings are designed and what spatial knowledge about urban futures is visually inscribed promises insights into the affective "legitimations" they contain for the particular planning project. Central to our understanding is the term "spatial knowledge," which we understand as the viewers' knowledge about future-built urban environments developing through the perception of visualizations in renderings and resulting in ideas of the structures to be built; this is why we also refer to them as imaginaries. In this sense, we will speak henceforth in an abbreviated form only of spatial knowledge or imaginaries. Typically, this knowledge is evoked by highly specialized visual artists by digitally constructing, visually expressing, and atmospherically designing the planned built environments.

Although previous literature has found that the use of renderings has increased significantly, there is still a great need for research. Existing studies so far have mostly made assumptions about the functions of renderings. For example, Watson (2020, p. 35) writes that these "new forms of [mediatized and digitalized] communication have the main aim of promoting up-market real-estate developments to potential buyers of land and property." Typically, statements about the goals, structure, and functions of renderings have been derived from planning scholars' own experiences and from expert interviews rather than analysing renderings as visual data. Additionally, the few studies that present image analyses do so in an illustrative manner, that is, without systematically analysing the visual data within the framework of an empirical research design and with concrete visual methods. Rather, the authors formulate critiques about renderings as a tool in planning discourses for selected neo-liberal developments (e.g., Aspen, 2013) or use them illustratively for critical investigations of urban forms (e.g., Easterling, 2014). Other authors study renderings by using a variety of single images from different urban development projects (e.g., Watson, 2014) or from one visualization office (e.g., Houdart, 2008; Rose et al., 2014; Stenslund & Bille, 2021). Furthermore, some studies focus on certain design elements that explain the specificities of renderings (e.g., Houdart, 2013; Nastasi, 2016; Rose & Willis, 2019; Ross, 2012; Smitheram et al., 2018).

Our article addresses this gap based on the following research questions: How do visual artists design renderings? I.e., what are important (atmospheric) design elements? What spatial knowledge (or imaginaries) about building projects do renderings propose visually, and how do they attempt to influence spatial knowledge about future urban spaces? In which processes are renderings produced? From a methodological perspective, we combined social scientific methods with empirical research methods from urban planning and design to analyse an extensive database of renderings from the two urban development projects mentioned above (see Section 3). We focused our analyses on the renderings produced in the two cases, as only in this way is it possible to understand the complexity of image production *within* a case and to draw conclusions about similarities or differences *between* cases.

The article is organized as follows: In Section 2, we report on a conceptual approach to the digital-visual construction of imaginary spaces and on the state of the art in research on renderings. In Section 3, we describe the two case studies and the methodological research approach in detail before presenting our empirical results in Section 4. We focus on three key aspects of the construction of affective atmospheres in renderings that are used to create imaginaries of planned urban spaces: the design elements of photorealistic representation and lighting, the production process of digital collage, and the homogenisation tendencies across the rendering production. Finally, in Section 5, conclusions are drawn about the influence of atmospheric renderings on spatial knowledge regarding urban development projects.

2. Previous Research on Renderings and the Digital-Visual Construction of Imaginary Spaces

In the title of our contribution, we speak of the visual construction of spatial knowledge about urban development projects, because commonly shared imaginary worlds of future urban spaces or specific building projects can be considered to have emerged in the context of communicative processes (see Knoblauch, 2019), especially through (digital) visualizations, such as in renderings. From a theoretical perspective, we draw on the concept of Christmann et al. (2020, pp. 2–4), which combines three theoretical approaches: The first one is that of mediatization and digitalization (Hepp, 2020), which states that people have been increasingly exposed to media and technologies, both analogue and digital, and that, as a consequence, the increased usage and experience of these novel tools has catalysed changes in human behaviour, particularly the way professions, individuals, or communities work and communicate. It is believed that such changes may also have influenced the organisation of our social world, our living environment, and even spatial arrangements. The second approach is a phe-

nomenological perspective on visualization (Christmann, 2008), pointing out that visualization must be conceived of as a depiction of objects. From this perspective, the visibility of the object not being present is actively produced by the creator(s) of the visualization (e.g., a photographer, a designer, or a visual artist) through particular visual means (e.g., a camera, design software, or atmospheric elements) and also by the viewers, because by deciphering visualizations, activating knowledge and imagining future-built spaces, they become an integral part of the visual process. The third approach is that of communicative constructivism (Knoblauch, 2019), which suggests that depending upon the kind of social actors as well as the means of communication involved, communicative action contributes to the social "construction" of (respective) commonly shared "realities." When applied to spatial processes, this means that (visual) communication must be understood as a fundamental element in the construction of (past, present, or future) spaces. The approach can explain how imaginaries can emerge, how they are communicatively negotiated, and how they can thus shape visions of urban futures, as well as the will to materialize them.

Urban planning is always directed towards the future. Accordingly, in renderings, as in most visualizations in the context of urban planning and design, the urban spaces that are visualized are situated in the future. We call these spaces "planned spaces" and the spatial knowledge about future urban places—as already said—"imaginaries" or "imaginary spaces."

Interestingly, how the perception of spaces is specifically influenced by atmospheric elements inscribed in the already built or designed environment has been discussed in social and spatial theory. For example, Löw (2016, p. 172) points out that spaces each have their own "potentiality that can influence emotions" and that this potentiality is created by atmospheric elements—or, put simply, by "atmospheres"—in the design in the sense of aestheticizations, which are understood as design elements that appeal to viewers emotionally. According to Löw (2016, p. 173), atmospheres make it possible to emotionally experience not only individual spatial objects but also entire spatial ensembles (e.g., architectural complexes).

These considerations can be applied to renderings, as the design of future-built spaces typically includes elements in the sense of aestheticizations. Typically, renderings digitally construct and anticipate the possible shape of future environments. In doing so, they create a social reality in the sense of socially shared imaginaries.

Incidentally, it was Böhme (2006) who once proposed the concept of atmosphere and influenced Löw's (2016) spatial theory. Böhme (2006, p. 16) has become very important to this strand of spatial research because he has explicitly emphasized that atmospheres are always spatial in nature and can be *manipulated*, especially by design and art professionals.

Visual artists seem to be very aware of this, for what they are trying to achieve with the help of specific atmospheric elements in renderings—and this will become clear in the empirical analyses in Section 4—is not only the visual creation of a future ensemble of individual objects but also of a coherent, emotionally appealing, and imaginary space.

In their study about renderings designed for architectural competitions, Smitheram et al. (2018, p. 276) found that "architecture, here, is desired for its atmospheric qualities to stage and to amplify affect." The authors were able to show that, in this context, the requirements for renderings were not only to visualize architecture but, at the same time, to convey meaning and emotion, while in contrast, earlier forms of architectural visualization consisted more of line drawings depicting "shapes, objects, symbols" and expressing "monumentality and power" (Smitheram et al., 2018, p. 276). Other authors have also clearly formulated that the intention behind the production of renderings is to create "affective atmospheres" with visual means (Anderson, 2009; Degen et al., 2017) that can generate positive affective perceptions of certain urban development projects among the public. Renderings are intended to appeal positively to as broad an audience as possible, which is why visual artists try to find the lowest common denominator. To achieve this, they produce imaginaries of planned urban spaces in a particular way that is similar to that described by Ash (2012, p. 6) for video game development: "Although the affects a particular technological system can produce can never be fully determined by its designers, these designers can produce systems that attempt to narrow the possibilities for the kinds of affective responses that are generated.''

What is also discussed in the literature and seems to be of particular importance for renderings is that digital images and the constructed imaginary spaces should not be seen as something static but as something that evolves in a dynamic process. Rose et al. (2014, p. 401) note that digital images created in planning processes are characterized by high "mobility, multiplicity, and mutability" and that they can be easily (re)produced and (re)circulated (see also Hoelzl & Marie, 2015; Houdart, 2008; Koreitem, 2019; Rose & Willis, 2019; Stenslund & Bille, 2021). These considerations were central to us and had a significant influence on the research design, for if one wants to examine renderings in the context of the construction of affective atmospheres and the creation of spatial knowledge about urban development projects, this suggests that it is not enough to simply analyse individual images; rather, it is necessary to take the dynamic construction process of affective meanings and knowledge seriously and to focus on the development of image production over time and in the context of the overall planning process.

A very different strand within the research field is the debate about the so-called authenticity economy (Banks, 2020; Zukin, 2010), in which (visualizations of) authentic-appearing aesthetic architectures are seen as having the role of adding extra value to real estate deals. Approaches from the field of political economy similarly

emphasize the importance of images. Rapoport (2015), for example, refers to the Global Intelligence Corps, an industry of architects, planners, engineers, and consultants from the private sector who play an important role in disseminating planning models and globally transporting a "modernization myth" (Healey, 2013, p. 1511) about the universal necessity of development in material and economic terms. In addition to their authority as experts, it is the ability of the CGI actors to "use images and experiences to persuade and seduce" (Rapoport, 2015, p. 321) that mobilizes planning ideas. Against this backdrop, visual artists can be considered part of the Global Intelligence Corps actors, which Rapoport (2015, p. 308) refers to as an "elite group" occupying a powerful position in planning processes and having a strong influence on the "shared construction" (Humphrey, 2020, pp. 10–13) of speculative processes—not least because influencing knowledge about future spaces is an integral part of speculation in urban development projects.

Interestingly, people outside the planning and architecture industry, in particular, have positive affective responses to urban spaces visualized in renderings (Llinares & Iñarra, 2014), at least in comparison to more abstract forms of visualization (Woodcock et al., 2012), even if they cannot afford to live in the proposed, often very exclusive locations (see Hendawy & Stollmann, 2020, p. 55). One of the reasons given is that photorealism has become increasingly refined in digital image production (see Schillaci et al., 2009), which now makes it possible to create very realistic and authentic atmospheres. Consequently, this accuracy or realism is increasingly sought after by visualizers, planners, and their clients (see Downes & Lange, 2015). However, when considering renderings, the latter perspective would disregard the fact that they are precisely not an exact depiction or realistic representation of planned building projects; rather, they are a deliberate construction of certain atmospheres in which the design element of "realism" is used strategically. This aspect is recognized by only a few social groups, such as urban activists (see Woodcock et al., 2012).

All of this suggests, as Christmann et al. (2020, p. 4) have put it, that "communicative practices of visualizing urban futures can only be analysed adequately when a critical perspective is applied towards the analysis of implicit visual cultures of the planning and design professions as well as stakeholders." As mentioned in the introduction, this type of research is still needed, and our investigation will be able to contribute to it.

Having discussed the relevant concepts and studies in the research field, in the following section, we will present our cases: the two urban development projects, the data basis, and our methodological design.

3. Case Studies and Methodological Design

As part of our study, we examined two large-scale urban development projects driven by private parties and of great importance in their respective cities. Eko Atlantic City is a project planned for an area of about 25 km^2 in the Atlantic Ocean off the coast of Lagos, Nigeria. The new city is planned to be an economic and financial centre with residential and commercial uses, including its own infrastructural facilities. The project is controversial because of concerns about coastal erosion, displacement of people from the adjacent shoreline, and the development of luxury residential and commercial high-rise buildings that some criticize as unsustainable (Ajibade, 2017; Fernelius, 2020; Oyedeji, 2015). Even though construction seems to be on hold, there is a lot of idealistic and financial support from private companies and government institutions in Lagos and around the world. Not much has been built in comparison to what is shown in renderings.

Hudson Yards is a project developed on the Far West Side of Manhattan in New York, USA. It is located at the northern end of the famous Highline Park and is part of the overall development of the former industrial area. Although it is much smaller (about 11 ha), it is a major development for the dense neighbourhood in Manhattan. The new neighbourhood was planned to accommodate large office spaces, a shopping mall, an event centre, and residential units; each building was designed and built by renowned architects. Estimated to cost about $25 billion (Tyler & Bendix, 2019), construction is challenging because it is built on the still-active railroad tracks to Penn Station, with high-rise buildings over 70 stories tall. The project is controversial due to these buildings' heights, financial support from city government programs, and a lack of affordable housing (Capps, 2019; Halle & Tiso, 2014; The Municipal Art Society of New York, 2017). The first phase of the development was completed.

These two urban development projects have been chosen because they are clearly part of the large-scale, privately financed, and speculatively driven developments that are included in a worldwide political-economic tendency towards "speculative urbanism" (Sood, 2019). Both are the largest development projects in their respective cities, driven by global actors of finance and development and targeted at large companies and the global middle class. Furthermore, these two cities are important hubs for the symbolic and actual renegotiation of urban environments today. New York, on the one hand, is seen as an ideal symbol of global cities around the world. Lagos, on the other hand, is a rapidly growing megacity that has not yet been investigated as much, but it faces fast and radical changes in its urban structure. Eko Atlantic and Hudson Yards have been planned and partly developed approximately at the same time with similar importance as supposedly model projects. As such, they have attracted international attention and have produced a large number of renderings that were published and circulated worldwide.

In an extensive search process, 687 renderings of the two megaprojects (318 of Eko Atlantic and 369 of Hudson Yards) were collected online in 2019–2020.

All renderings showing one of the two megaprojects were saved and, if necessary, further similar images were collected (e.g., new versions of the same rendering). The focus was on architectural and urban planning views, while interiors were excluded from the analysis. Using the open-source software digiKam, we then wrote information about publication dates, image producers, locations, and content of the images into the metadata.

Typically, most visual methods are concerned with either interpretive analysis of individual images (e.g., in the social sciences) or with quantitative and computational analysis of large collections of images (e.g., in digital art history). To grasp the urban dimensions of this extensive image material, our methodological approach builds on sociological visual discourse analysis (Fegter, 2011; Renggli, 2014; see also Christmann, 2008) but incorporates methods of urban design. Graphic methods from design disciplines and visual methods from discourse analysis are well suited to investigate renderings as a form of architectural visualisation. To our knowledge, this approach is new and has not been applied before.

The image analyses were supplemented by qualitative expert interviews (Mieg & Oevermann, 2015) with visual artists employed by a variety of clients in the USA and internationally. Four interviews were conducted, of which two had worked directly on the Hudson Yards project. The interviews allowed us to verify our findings of the production process and the imaginaries proposed in the images, but the focus of this study was on image analysis.

Against this background, the concrete work steps were as follows: As a first step, we created a project timeline for each urban development project, which contains information on (planning) actors, important project phases, and events from the first competitions or master plans to the end of construction. On this basis, we were able to temporally classify the collected images of the image database and to examine the progressions, as well as changes, in the image production and visual communication processes of the two projects. In a second step, we investigated the image database (i.e., we analysed the rendering collection as a whole). By grouping similar images, we were able to identify recurring image types for each case. The results of this process will be discussed at the end of Section 4.

Finally, in the third step, we performed single-image analyses (e.g., Raab, 2012) on renderings that were framed as key visuals by interview partners or published many times throughout the timeline and in a variety of publication formats. This was done, among other things, in interdisciplinary data interpretation sessions (see Mélix & Singh, 2021).

Overall, this methodological design proved useful. It allowed us to analyse the processes of image publication, specific design elements of the images, and the different types of images used. Thus, we were able to explain the three main elements of the creation of affective atmospheres in renderings and how they develop the power to convey specific imaginaries about future spaces.

4. Findings: The Construction of Affective Atmospheres in Renderings

In the following sections, we will report on the key findings of our investigation based on a few selected data examples from the image database and the interviews. We will show how affective atmospheres are constructed in renderings on three levels: (a) through the atmospheric design elements of photorealism and lighting (Section 4.1), (b) through the phenomenon of digital collage in the production process (Section 4.2), and (c) through the use of a limited number of characteristic image types (Section 4.3). It will become clear throughout the analysis how these distinct levels of the creation of affective atmospheres are used to convey an impression of coherence, completeness, and feasibility of the urban development projects.

4.1. Atmospheric Design Elements: Photorealism and Lighting

A consistently evident central design element and typical feature of renderings is their photorealistic aesthetics. This photorealism is mainly achieved by elaborately and digitally generated lighting effects. The following rendering is an example of how a realistic impression is constructed (see Figure 1). It shows an elevated view of Hudson Yards, with a bird's-eye view of the existing older brick buildings in the foreground. Lighting situations are constructed to be as convincing as possible. The sky and surrounding buildings are reflected in the glass facades of the proposed high-rises. A slightly cloudy sky indicates rays of sunlight coming from the left, which are reflected on the bright sides of the glass towers. All these measures serve to visually integrate the planned buildings into the already existing urban fabric, while their novelty is only apparent through their height and geometric prominence in the picture frame (see also Mélix & Singh, 2021). This made the entire ensemble look deceptively real as if it had already been built in this form. The visual construction conveys the knowledge that the project was feasible and has already been successfully completed. Due to the radiant and shiny effects, the new buildings stand out in an impressive way from the comparatively less prominent older buildings, which, at the same time, enhance the entire ensemble. An impressive atmosphere is sought after so that viewers can potentially develop shiny and pleasant imaginaries of the proposed built environment.

In the context of digitalized architectural visualization practices, such as renderings, lighting plays a central role in the construction of spatial atmospheres and enables the viewer to engage with them affectively (Böhme, 2006, p. 103; Rose & Willis, 2019). Against this background, the task of visual artists is to visualize light as

Figure 1. A rendering of Hudson Yards in Manhattan. Source: Klayko (2012).

we can perceive it in reality, namely through certain colours, reflections, shadows, etc. As one visual artist said in an interview:

> For me, it was a lot about—it's about light. No one will—no client will tell you you should light it exactly this way or that way or how much warmth you gonna get, and for me, personally, it is a lot of that individual freedom [while rendering]; it's actually how you manipulate light or understand light. (KL, interview, October 23, 2019)

In fact, on a technical level, much effort has been put into the development of lighting engines in recent years. This is reflected in the term rendering, which originally refers to the way a computer calculates 2D or 3D images from a dataset. Today, an experienced visual artist has the means to manipulate the lighting of a visual representation to a high degree and, thus, achieve the desired look of an image (of architecture), as the following interviewee explains: "As far as, like, reflectivity and stuff we try to be very real, we'll push it to the best-case scenario" (RL, interview, October 31, 2019).

At the same time, however, there seems to be an ambivalent attitude toward what counts as realism in the profession. Some visual artists concede that renderings can be quite sober, but they also allow room for creative atmospheric interpretation. One of our interview partners says: "A lot of times I think, especially in privately developed projects, you sort of wanna push it to the shiny, like, perfect aspect rather than to reality" (KL, interview, October 23, 2019). However, there seems to be some pressure from clients, especially developers, to produce realistic views and lighting. Another interviewee described this as follows:

> In the last, let's say five to 10 years, it has become a lot more stick with reality…because I think images are so prevalent now that they don't want buyers and people…to be let down because they show up and say like "This is not what we thought we wanted." (RL, interview, October 31, 2019)

This shows that developers often ask to see a future building project from the same perspective and light as it would be in the finished built condition so that they can avoid disappointment and criticism after completion.

Nevertheless, the following is true for the example analysed here, as well as for the other renderings examined: The constructed photorealistic space in renderings avoids references to uncertainties, conflicts, speculations, or possible alternative futures that are usually part of planning processes. Because carefully lighted renderings are marketing tools commissioned mostly by developers, they don't show the speculative character of planned urban environments. Therefore, we argue that the lighting factor is an atmospheric design element that is central to creating a realistic impression and imaginarily suggests the feasibility of the depicted building project while trying to please or impress viewers.

In the next subsection, we leave the level of the photorealistic image surface and direct our attention to another significant feature: the digital collage, which typically takes place during the production process of renderings.

4.2. The Image Production Process: Digital Collage

This subsection is about the dynamic process of digitally creating an atmospheric collage in renderings. Let's assume at the outset that the technique of collage in digital images can convey imaginaries of coherence with regard to the atmospheres and functions of new urban places, and let's start again with the analysis of an exemplary rendering.

Figure 2 shows a promenade along the planned marina of Eko Atlantic City. Many desirable elements of urban life for the middle and upper classes are gathered in the image. People are shopping, they have some leisure time, and they are generally quite young. There are trees, clean surfaces, good weather, etc. You can see the buildings glowing and shining; warm yellow light emanates from the first floors and surfaces and shines and reflects in the water, where expensive pleasure boats can be seen in the background.

The rendering thus gives the impression that the overall social and built environment is harmonious and works well on a functional and atmospheric level. This impression is created through a careful and deliberate selection of visual elements. Visual artists digitally and selectively place people, buildings, plants, materials, cars (or no cars in this example), and other elements into imagined urban environments. Social configurations are created and tested (Houdart, 2008, p. 48), and the renderings contain a series of deliberately chosen inclusions and exclusions, institutional and social structures (Degen et al., 2017), and a particular (Western) view of modernist cities (Watson, 2020). These are visually synthesized on the image plane to create coherent visions, as the following visual artist explained:

> You don't want them to—you really wanna control how things are perceived, and you don't want to go beyond that. And you want to limit the imagination as much as possible. As much as you open the imagination, you also wanna very close down that imagination. And I feel that's where the true power of rendering is. (KL, interview, October 23, 2019)

This is to say that no other possibilities or alternatives to the depicted social and built environments are supposed to be imagined on the basis of the rendering.

Visual artists actively seek a perfect balance and visual unity between potentially conflicting systems, as expressed in the following statement: "You know, usually the influence comes in what's not shown….That's where most of the influence is because they don't want people talking about something" (RL, interview, October 31, 2019).

In this context, our analyses furthermore revealed that because of this social complexity, the aspects that are atmospherically inscribed in renderings via digital collage are typically constructed in a collaboration between visual artists and architects, developers, and sometimes other actors as part of a longer planning process. As some visual artists described, integrating various stakeholders within the different planning phases and incorporating their points of view into the image construction were crucial for the rendering and, ultimately, the building project to gain reality in everyone's eyes.

Figure 2. A rendering of the marina for Eko Atlantic. Source: BBB International (2014).

Many visual artists even found the process of image production to be full of friction, in which they had to act as integrators and translators of diverse spatial knowledge.

As part of the production process and ongoing communication with clients, renderings are constantly revised to translate the respective (new) requirements into the images: "It's a lot of guessing, but after you do [it] a few times, you sort of, depending on the clients and the audience, you sort of get a better sense of it over time" (KL, interview, October 23, 2019). While the visual artists create coherent atmospheres in the renderings, they also allow room for interpretation and play with atmospheric elements. Despite—or perhaps because of—the complex process of the social construction of the rendering, however, the image retains its imaginary character: "So it is kind of guesswork anyway, so any image that you see of Hudson Yards at any time, unless the building has been built already, there's no 100% sure exactly what it's gonna look like" (VH, interview, October 21, 2019).

In view of this fluid character of renderings, the atmospheric elements, and the spatial knowledge inscribed within them are constantly changing, as are the suggested spatial imaginaries. A published rendering always represents only one valid compromise between all parties involved at a particular point in time. The ongoing active manipulation of a rendering thus stands in peculiar contrast to the realistic, feasible, and coherent imaginary spaces that are temporarily proposed there. However, this does not seem to detract from the affective atmosphere produced. Rather, it seems that this fluidity multiplies spatial knowledge and inspires creativity to develop atmospheric imaginaries.

4.3. Image Types: Homogenization

A third result of our study is that the comparison of the datasets of Eko Atlantic and Hudson Yards revealed a high similarity in the renderings, pointing to a visual homogenization across the database.

Much has been written about the fact that certain planning models, planning solutions, and even architectural forms can spread widely in global processes, are taken up in a wide variety of places, and become increasingly similar around the world (see Healey, 2013; Park, 2019). Renderings in planning processes reveal a similar phenomenon. While some researchers have described different types of architectures visualized in photographs (Grubbauer, 2008) or types of digital human figures in renderings (Houdart, 2013), analysis of our image database revealed that both projects used a very limited number of image types, with only minor local adaptations. By sketching all renderings according to their framing of architectural elements, use of perspective, and overall geometries (see the explanation of methods in Section 3), we were able to identify 19 image types for Hudson Yards and 18 for Eko Atlantic throughout the database (see Figure 3). While they cannot all be described here, it is important to note that typical ways of representing architectures can be found in our case and that they are very similar in a relevant number of renderings of the two large-scale projects. This is remarkable in that—as is well known from architectural theory (e.g., Jacob, 2018)—the choice of perspective, in particular, exerts a strong influence on the way spaces are perceived and understood.

Despite their visual homogeneity, many renderings proved to be very effective in the discourses about the urban development project in their respective local contexts, as they were widely published and shared. However, it became apparent that it is not only the specific quality of each individual (similarly structured) image that develops a persuasive power but also that this power is due to the impressions created by the large number of renderings produced throughout the planning processes. In interviews, visual artists spoke of trying to create local meaning or stories in a series of multiple renderings:

> We could sometimes just say "ok, you want one hero shot, three interiors, one bathroom" whatever and then you just do something, but it's just so much nicer if you get to sort of make a whole complete story with

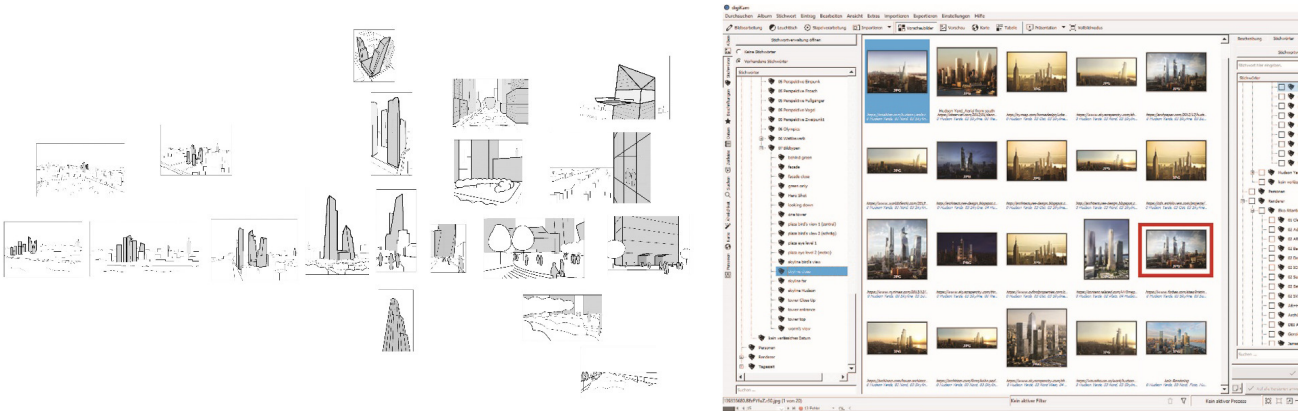

Figure 3. An overview of the image types produced for Hudson Yards (left) and a look into one of the image types of Hudson Yards (screenshot from the image database, right).

> it. So we try and sell the story because then when you are making your image it has more meaning to it. (VH, interview, October 21, 2019)

The imaginary space of the planned urban development project is thus developed over time by adding and sometimes changing existing renderings (in this case, between 2007 and 2020). It is not a consistent spatial arrangement but an imaginary space that is constantly evolving, changing, and adapting, reflecting the circumstances of the planning process in many ways. By creating numerous renderings and adding images throughout the planning process, the developers and visual artists strive to create a complete vision of the proposed spaces: "We took so many pictures of the mall that you go and think, 'Oh yeah, that looks very familiar' " (RL, interview, October 31, 2019).

We would like to argue that in this way, an atmosphere of completeness is created for the viewer, as well as the impression of having seen it all and knowing it from all possible angles. Actually, when looking at the entire database of each development project chronologically, one almost has the impression of rotating around and zooming in on the buildings and places depicted. The various identified image types thereby form the patterns, so to speak, of this relational spatial formation.

In the following section, we will conclude by summarizing the key findings, explaining how this is relevant to the scientific debate, and by pointing out the limitations of our study while defining new fields of research.

5. Conclusions

Although more and more urban development projects are making increasing use of renderings as part of marketing strategies, there has not been systematic empirical research that considers image production as a whole. Our study fills this gap by asking what important (atmospheric) design elements of renderings are, in what processes renderings are produced, and how renderings thus attempt to influence imaginaries about future urban spaces.

In this context, we researched renderings as digital visualizations of future building projects by focusing on three main characteristics: (a) a photorealistic aesthetic, characterized mainly by the element of lighting; (b) a digital collage including further atmospheric design elements, which is produced very purposefully, in elaborate processes to create harmonious—social and physical—worlds; and (c) a homogenization of image types that are uncluttered in their number and the structure but able to create comprehensive visual narratives of the planned building projects.

Based on this investigation of image databases, we were able to show in our two cases that affective atmospheres were constructed with the help of the three characteristics described above. Such atmospheres can meet the requirements of developers and other planning actors while simultaneously appealing to a broad, heterogeneous audience. Particularly through atmospheric design elements, renderings can influence the imaginaries or spatial knowledge that viewers develop in the respective urban planning projects. These design elements are supposed to make the building projects appear not only as pleasant and desirable but also, above all, as feasible, coherent, and complete. This is where we see the main reasons for the widespread and numerous uses of renderings in communication about urban development projects. If renderings for proposed projects can widely and convincingly convey that projects are complete, coherent, and feasible, the corresponding spatial transformations can be better legitimized (see Mélix, in press).

It is striking that the phenomena described for renderings were equally observable in both the planning projects studied, despite the very different planning and cultural contexts in New York City (USA) and Lagos (Nigeria) and the iterative nature of the image production process. The aspect of global homogenization has been touched upon by other authors (e.g., Grubbauer, 2008; Mélix, in press; Rose & Willis, 2019; Watson, 2014), and we have been able to confirm it on the level of the images and their specific design elements. Only at the level of the digital collage were minor differences evident. There, design elements, such as people, vegetation, or objects, were sometimes adapted to local conditions and visual habits. In addition, visual communication via affective atmospheres seems to be the common choice of architects and developers.

Although our study has allowed us to better understand the process of the digital-visual construction of imaginaries about specific building projects, the study also has its limitations. In the future, we see the following research areas as particularly important.

Since renderings deliberately construct imaginaries of future urban spaces by anticipating not only the built form of these places but also—at the level of digital collage through the inclusion or exclusion of things—by atmospherically co-constructing social worlds, attention will have to be paid to which social worlds exactly these are; for example, what kind of people (in the sense of race, class, and gender) are represented. We were not able to do this in the context of our study, but it would be an important research question.

Another future research question is how renderings—given the power and potential of digital visualizations—will affect the level of internationally circulating planning ideas, especially how they drive homogenization processes in visualizations and possibly even in building itself. This requires a comparison of a much larger number of planning projects worldwide, which was not done in this study.

As indicated in Section 2, renderings can drive speculative processes in the context of large-scale urban developments through the deliberate creation of certain imaginary worlds, which usually play a central role in

speculation. Additionally, renderings present a consensual vision of future spaces, even though affective atmospheres are always ambivalent and are brought forward in a dynamic relational process. This will have to be made more aware of in the future, especially since the speculative and potentially conflictual character of the proposed imaginary spaces remains largely hidden behind the luminous photorealistic surface of renderings.

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Conflict of Interests

The authors declare no conflict of interests.

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