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EDITORIAL

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Co-Production in the Urban Setting: Fostering Definitional and Conceptual Clarity Through Comparative Research

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Abstract

Co-production is a concept which is increasingly popular in the planning field to refer to multi-stakeholder collaboration and partnership with citizens. However, the existing literature suggests that the rapid growth of the concept has resulted in ambiguity about its meaning. Given that the concept has a potential in planning research and practice, the thematic issue aims to present studies that use comparative approaches as a way to sharpen the understanding of co-production. The issue includes one commentary and six articles with empirical evidence from various countries across the world. The editorial provides overarching context and introduces each contribution of the issue.

Keywords

co-7-framework; co-production; comparative research; urban development

Cities change and face various challenges that are increasingly complex, intractable, persistent, and not amenable to simple solutions (Boyle & Harris, 2009). What is more, when governments prove to be incapable of being the only possible supplier of public goods and services, collaborative forms of public service delivery gain significance (Watson, 2014). This phenomenon is known as co-production; it refers to the collaboration between service professionals and users in the design and delivery of public goods and services (Bovaird & Loeffler, 2015). Underlying co-production is the idea that networks of public, private, and civil society organisations and partnerships with citizens can increase context-specific and effective solutions while maintaining the public values (Bovaird & Loeffler, 2012; Ostrom, 1996). Although co-production has often been associated with the delivery of public goods and services, at its core it remains a concept that refers to all phases of delivery processes from planning to management (Bovaird & Loeffler, 2012; Paskaleva & Cooper, 2017). Thereby, it aims to create win-win situations that are beneficial for all as cities adapt, transition, or transform into more sustainable and desirable futures.

As interest in co-production grows, however, so does the sense of conceptual unclarity. Indeed, our recent study (Lee et al., 2023), which examined the existing definitions of co-production in the planning literature, reveals that the concept has not been well defined. The definitions are inconsistent and ambiguous, requiring more conceptual clarity to avoid contention. Following this argument, this thematic issue seeks to foreground methodologically comparative approaches as a way to sharpen understanding of differences and commonalities that might enhance the concept of co-production. To illustrate, distinguishing or discussing seven dimensions of co-production (i.e., *actor*, *reason*, *input*, *output*, *phase*, *means*, and *context*; see co-7-framework in Lee et al., 2023) can be points of entry for such comparative insights. Thus, in the following paragraphs, we present a summary of each contribution while referring to the seven dimensions.

Co-production involves multiple *actors* as illustrated by Caitana and Moniz where they study under what conditions co-production processes effectively promote active involvement of citizens. Based on the cases of implementing nature-based solutions for urban regeneration, the authors present how *actors* such as public authorities, local associations, citizens, and researchers are engaged in various *phases* as well as the *input* and *output* of their co-production.

The article by Solum, Førde, and Guillen-Royo presents outdoor equipment lending outlets as an *output* of co-production that bridges the divide between government, civil society, and the market. *Actors* such as public officials, civil society *actors*, and volunteers co-produce lending outlets to reduce consumption and achieve societal and environmental goals.

The article written by Munenzon discusses the *reasons* for co-production. By studying three Houston neighbourhoods, the authors evaluate the role of co-production in promoting neighbourhood-scale adaptive capacity and reshaping power dynamics to advance equity and environmental justice.

Co-production is achieved through various *means*, one of which is digital platforms. As illustrated by Kylasam Iyer and Kuriakose, there are various digital platforms, which enable co-production in urban affairs. The authors critically evaluate a number of these in Bengaluru, India. Their analysis provides an insight into what kind of digital platforms enable co-production and to what extent.

Another *means* of co-production is the citizen panel. Yet, there are various challenges and dilemmas of citizen panels in achieving transformative co-production in urban planning. While presenting some of the challenges, Aruga, Refstie, and Rørtveit argue that co-production may not necessarily result in a more inclusive and effective *output* unless power inequalities are challenged.

Co-production takes place in different *contexts*. The article by Alfaro d'Alençon and Moya compares co-production practices in Chilean and German *contexts*, seeking to foster joint learning processes bridging the North/South divide. They link co-production to the "right to the city" concept and focus on the capacity of co-production to challenge power structures and institutional settings.

Lastly, this issue contains a commentary by Sophie Schramm which points out the potential and precarity of co-production. She argues that the concept may normalise and stabilise exploitative state-citizen relationships. Hence, a narrow definition of the concept is necessary in order to distinguish it from the exploitation of citizens' financial resources, time, and labour. She also calls for scholarly engagement with co-production by

examining the existing uneven power relations between government and people. Indeed, this is an important point raised by other contributions of the issue. Authors see potential in co-production, but also provide critical perspectives especially with regard to power imbalance, drawing attention to the gap between the goal of co-production and its impact.

In all contributions, the authors used comparative approaches to better define co-production. First, authors used existing literature (Brandsen & Honingh, 2018; Brudney & England, 1983; Osborne et al., 2016; Ostrom, 1996) to unpack and critically examine similarities and differences of co-production with other terms. *Phase* was often considered a decisive factor to differentiate co-production from co-design (see Alfaro d'Alençon & Moya), co-creation (see Aruga et al.; Caitana & Moniz), and co-management (see Solum et al.). Moreover, the level of public engagement and involvement of government were regarded important factors that make co-production distinctive from other concepts like information, interaction, participation, or self-organisation (see Alfaro d'Alençon & Moya; Kylasam Iyer & Kuriakose; Munenzon). After discussing similarities and differences of the concepts in the literature review, authors presented their empirical study, which involved comparing two to five case studies from Norway, Germany, Portugal, India, Chile, and the US. While the contributions show that there is not a single definition of co-production in the planning field, they demonstrate that comparative approaches can certainly be a way to enhance the understanding of co-production. Hence, we call for more empirical evidence, which allows comparison between co-production and other concepts, so that more clarity can be given to the concept.

Conflict of Interests

The authors declare no conflict of interests.

References

Bovaird, T., & Loeffler, E. (2012). From engagement to co-production: The contribution of users and communities to outcomes and public value. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, *23*, 1119–1138. https://doi.org/10.1007/s11266-012-9309-6

Bovaird, T., & Loeffler, E. (2015). Co-producing public services with users, communities, and the third sector. In J. L. Perry & R. K. Christensen (Eds.), *Handbook of public administration* (3rd ed., pp. 235–250). Jossey-Bass.

Boyle, D., & Harris, M. (2009). *The challenge of co-production*. New Economics Foundation.

Brandsen, T., & Honingh, M. (2018). Definitions of co-production and co-creation. In T. Brandsen, T. Steen, & B. Verschuere (Eds.), *Co-production and co-creation: Engaging citizens in public services* (pp. 9–17). Routledge.

Brudney, J. L., & England, R. E. (1983). Toward a definition of the coproduction concept. *Public Administration Review*, *43*(1), 59–65. https://doi.org/10.2307/975300

Lee, D., Feiertag, P., & Unger, L. (2023). Defining co-production: A review of the planning literature. *Journal of Planning Literature*. Advance online publication. https://doi.org/10.1177/08854122231219919

Osborne, S. P., Radnor, Z., & Strokosch, K. (2016). Co-production and the co-creation of value in public services: A suitable case for treatment? *Public Management Review*, *18*(5), 639–653. https://doi.org/10.1080/14719037.2015.1111927

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy and development. *World Development*, *24*(6), 1073–1087. https://doi.org/10.1016/0305-750X(96)00023-X

Paskaleva, K., & Cooper, I. (2017). Co-production and governance for smart city services: Learning from practice. *International Journal of Services Technology and Management*, *23*(5/6), 349–360. https://www.inderscience.com/info/inarticletoc.php?jcode=ijstm&year=2017&vol=23&issue=5/6

Watson, V. (2014). Co-production and collaboration in planning—The difference. *Planning Theory & Practice*, *15*(1), 62–76. https://doi.org/10.1080/14649357.2013.866266

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COMMENTARY

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Co-Production Between Insurgency and Exploitation: Promises and Precarities of a Traveling Concept

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Abstract

Co-production has inspired planning practice and research in the past decades. Along with its appropriation in the planning literature it has undergone manifold translations and its boundaries have become blurry. In this commentary I propose a conceptualisation of co-production not only as efficient service provision by citizens and state actors together but furthermore as a kind of city-making that has transformative potential beyond concrete interventions in the present moment. This matters because it enables a conceptual discrimination between co-production and the exploitation of marginalised people's resources, time, and labour. I argue that the necessity of this discrimination becomes apparent when analysing co-productive efforts in their embeddedness in space and time.

Keywords

co-production; heterogeneous infrastructures; insurgent planning; Southern urbanisms

1. Introduction

Co-production traveled globally in the past decades, from place to place, across academic discourses and urban practices. On its journey, co-production entered the planning field where it inspired new thinking about citizen–government relationships in city-making and urban governance (Watson, 2014). It is a promising concept not least because its roots in Southern urbanism enable it to refresh and transcend more traditional perspectives on state–society relations shaping urban planning, as transported for example in notions such as participation or citizen engagement. Unsurprisingly, on its journey, co-production has run through myriad translations and appropriations, from place to place, from discourse to practice and from one scientific field to another, changing its meaning and shifting its boundaries. Not only does the concept of

co-production share blurring boundaries with participation or citizen engagement but, on its global travel, and in the wake of its reception in the planning literature, the term has also decomposed into a variety of notions, such as co-design, co-governance vis a vis co-finance, and so on.

This bears the question: What is left at its core, what remains there for us to recognize one thing as co-production and another thing as something else, maybe participation or other forms of citizen engagement? This is a question this thematic issue makes important contributions to. I argue that this matters because co-production is not just a promising concept but at the same time a precarious one. It is precarious because it may engender a normalization and stabilization of exploitative state–citizen relationships and thus a further marginalization of already marginalized groups in the global South and beyond. The precarity of co-production becomes visible when seeing it in its spatial and temporal embeddedness in broader urban dynamics of resource access and distribution. Therefore, I propose a narrow definition of the concept. I illustrate this point below considering instances of basic service delivery in Southern cities.

2. Approaching Co-Production

In her seminal piece, Ostrom (1996, p. 1080) argues from an economic viewpoint when she suggests to balance wages of public officials for a given service against opportunity costs for the urban poor in providing this service as an indicator for potential success of co-production. According to her, co-production works when officials' and residents' activities complement one another to the effect that public officials and residents together provide a better service than each party alone. Her focus is more on state actors and their role in granting citizens a space to co-produce rather than excluding them from contributing time and labour. Mitlin (2008) adds a stronger emphasis on the people's roles and perspective when she argues that for co-production to realise its transformative potential, the initiative needs to come from the people themselves. In other words, only if urbanites see the need and possibility to change a situation and to engage with government actors in different facets of city-making, will co-production efforts be lasting and fruitful. This echoes Appadurai's (2001) notion of deep democracy, according to which change needs to start from what people can know and understand. As Watson (2014) explains, this may engender the production of collective spaces for city-making beyond those legitimized by the government. This is particularly insightful for planning research and practice in the global Northwest, where government institutions are often still seen the sole legitimate frames for citizen engagements.

3. Limitations of a Promising Concept

Co-production is clearly inspirational for planning studies and practice globally. Nevertheless, it remains a precarious concept. Its precarity becomes visible when considering it in its spatialities, that is, its embeddedness in broader urban dynamics of resource distribution, and in its temporalities, that is, the ways in which it may transform over time and how it may further transform not only urban space and access to resources, but also dominant discourses about these.

Firstly, promising co-productive engagements may slowly erode, as we saw in our own research on water and sanitation in Dar es Salaam, Tanzania. We found that in an NGO and CBO-initiated co-production of water through kiosks connected to utility pipes, the community over time withdrew from kiosk management and

allowed the person selling water from the kiosk to run it as a profitable business, not adhering to the formal rates for water (Schramm, 2018). In another instance, it was the utility that prevented the co-production of water through community-run kiosks sourcing water from the utility network by not actually connecting the kiosks to its pipes. After a while, the kiosks were run by private entrepreneurs who bought water from tanker trucks and sold it on to people living in the neighborhood. This distancing of officials and people from the project that local residents once had constructed together with local governments and the utility mattered because it resulted in water costs considerably higher than those officially stipulated and paid by urbanites connected to municipal networks, who are often wealthier than those disconnected. While this may be read quite simply as a story of failed co-production, this project in the end further stabilized uneven resource access in Dar es Salaam.

Further, the limitations of co-production become apparent when considering it across service domains. In a much-lauded NGO engagement in water provision for the urban poor in Dhaka, Bangladesh, actors were able to co-produce water infrastructures through water kiosks connected to the utility network across settlements without household connections. This clearly improved economic returns of the utility as well as the reputation of the NGO that received funds from international donors. The NGO then supported non-sewered sanitation in settlements disconnected from the sewage network. However, here the utility withdrew, leaving sanitation of poorer disconnected settlements to NGOs and CBOs alone and serving only the minority population connected to municipal networks. This again improved the utility's books, but urban dwellers were left to cope with their sanitation without state support or involvement (Heidler et al., 2023). Referring to Ostrom (1996) who emphasizes the importance of state actors engaging in co-production, we see here the opposite of a situation she found: Officials do not prevent co-production because they feel their dominance in service provision is questioned, but because they withdraw in the name of efficiency—not of the service provided, whose efficiency may actually suffer, but of their own operations. Thus, particularly in the present moment when utilities remain subject to broader pressures of commercialization and demands of cost-efficiency, co-production may become compromised when officials' calculations focus more on the efficiency of their operations than on the service, encouraging them to withdraw from providing or even co-producing services when these efforts may run counter to their goal of efficiency in utility operations.

More broadly, a perspective on co-production in its embeddedness makes apparent its precarious relationship with questions of urban justice. The incidents mentioned here and elsewhere underline how urbanites' dis/engagement with service provision reflects uneven power relations, between state and non-state actors, within neighborhoods, where actors appropriate co-produced infrastructures as a business, and between neighborhoods, when more solvent geographies are connected to less costly alternatives that do not require residents' contributions of time and labour. Further, where officials may withdraw from service provision to poorer neighborhoods, co-production of other services may enable actors to normalize unjust infrastructural constellations. Importantly, in light of a broad recognition of the heterogeneity inherent to urban infrastructures per se, the task lies in distinguishing unjust infrastructural constellations from mere differences in access to basic services, as the latter need not be unjust.

4. Transformative Potentials

My point is by no means to discount co-production. On the contrary, precisely because of its transformative potential it is paramount to hint to its precarities and the related necessity to advance it beyond the aspect

of efficiency in service provision through the contribution of resources by officials and citizens to include its transformative impact in terms of the relationship between citizens and state actors. Only if such a changing relationship toward a more progressive one exists may co-production prevent further exploitation of already marginalized urban dwellers. On the other hand, if this change in relationship is not in sight in citizen–state engagements in a given project, citizens, NGOs, and governments may well decide to turn away from the project and rather focus on long-term engagements with each other. This resonates with Appadurai's (2001, p. 28) idea of a politics of patience, which calls for urban actors to not only focus on improved services or access to basic needs in the present moment but to engage in a slow and long-term political process.

I propose to mobilise Miraftab's (2009) concept of insurgent planning in order to determine whether a co-productive effort has transformative potential. Miraftab (2009) defines insurgent planning as transgressive, i.e., happening in two distinct spaces, namely *invited* spaces of participation, the formal channels for engagement that are legitimized and provided by the government, and *invented* spaces of participation, spaces that people have created themselves outside of formal platforms for engagement and that are often delegitimized by governments. I argue that beyond the production of, and engagement with, these two spaces by citizens, co-production requires a further condition: State actors need to be willing and able to engage with invented spaces of action and to turn them into sanctioned spaces in the co-productive process. Only if these conditions, the economic one, that either actor cannot provide the service as efficiently as both actors together, and that actors engage in a transformative process together that will work against broader inequalities and injustices, are met, can we actually speak of co-production.

This means that despite the burgeoning literature on co-production and the enthusiasm of many urban scholars for co-production, given these conditions, actual co-production may be rare. Still, applying these conditions enables us to draw a line between co-production and the exploitation of people's financial resources, time, and labour by official utilities, state agencies, or other actors. This matters specifically in the present moment, where, for example, dominant paradigms of commercialization and full cost recovery put utilities under pressure when engaging in more costly or risky endeavours.

Lastly, when seeing co-production as transgressing spaces of participation provided by governments (Castán Broto et al., 2022), a key task for scholarly engagement with co-production becomes the analysis of existing uneven power relations and inequalities in access to resources between governments and people. Thus, one important merit of this thematic issue is the problematization of these relations and inequalities, and the ways people and governments address these in co-productive processes. Overall, precisely because of the potentials and precarities of the concept, this thematic issue's contribution to a clarification of the term is laudable, for this clarification may be a step toward transformative urbanism and city-making more broadly.

Conflict of Interests

The author declares no conflict of interests.

References

Appadurai, A. (2001). Deep democracy: Urban governmentality and the horizon of politics. *Environment and Urbanization*, *13*(2), 23–43. https://doi.org/10.1177/095624780101300203

Castán Broto, V., Ortiz, C., Lipietz, B., Osuteye, E., Johnson, C., Kombe, W., Limbumba, T. M., Macías, J. C., Shrivastav, S. K., Hadny, A., Kisembo, T., Koroma, B., Macarthy, J. M., Mbabazi, J., Lwasa, S., Pérez-Castro, B.,

Díaz, J. P., Rivero, L. R., & Levy, C. (2022). Co-production outcomes for urban equality: Learning from different trajectories of citizens' involvement in urban change. *Current Research in Environmental Sustainability*, *4*, Article 100179. https://doi.org/10.1016/j.crsust.2022.100179

Heidler, A., Luies, S. K., Kamal, A., Ul-Alam, M., Lüthi, C., & Crevoisier, O. (2023). On whose terms: Utilities, enterprises or communities? The territorial political economy of water and sanitation sector reforms in Dhaka. *Environment and Urbanization*, *35*(1), 156–177. https://doi.org/10.1177/09562478221149915

Miraftab, F. (2009). Insurgent planning: Situating radical planning in the Global South. *Planning Theory*, *8*(1), 32–50. https://doi.org/10.1177/1473095208099297

Mitlin, D. (2008). With and beyond the state—Co-production as a route to political influence, power and transformation for grassroots organizations. *Environment and Urbanization*, *20*(2), 339–360. https://doi.org/10.1177/0956247808096117

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073–1087. https://doi.org/10.1016/0305-750x(96)00023-x

Schramm, S. (2018). On-demand connections, formalization and multiplications: Dis/ordering water supply in Kimara Mwisho, Dar es Salaam. In U. Engel, M. Boeckler, & D. Müller-Mahn (Eds.), *Spatial practices: Territory, border and infrastructure in Africa* (pp. 173–189). Brill. https://doi.org/10.1163/9789004367012_011

Watson, V. (2014). Co-production and collaboration in planning—The difference. *Planning Theory & Practice*, *15*(1), 62–76. https://doi.org/10.1080/14649357.2013.866266

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ARTICLE

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Co-Production Boundaries of Nature-Based Solutions for Urban Regeneration: The Case of a Healthy Corridor

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Abstract

Co-production, rooted in public collaborative management (Ostrom, 1996) or science and technology (Jasanoff, 2013) evolution, has demonstrated its innovative and transformative character within participatory processes. However, there is little empirical evidence that scrutinises these contexts of interaction. Equality of partnership in many cases is used as a discursive rhetoric that seeks to prescribe co-production above any difficulty, uncertainty, conflict, or unwanted situation. As a starting point, our proposal considers co-production as a social practice, composed of multiple layers and different participatory processes, activities, and strategies. Grounded in co-production approaches, the study draws upon the ongoing evaluation findings of the European project URBiNAT, which focuses on inclusive urban regeneration through nature-based solutions. The qualitative methods of evaluation (interviews and participant observation), applied during the co-production activities in the city of Porto (Portugal), provide evidence of how the various stakeholders—elected politicians, citizens, technicians, and researchers—participate in the co-production dynamic. The boundaries of a multi-stakeholder process are revealed with the goal of implementing healthy corridors in peripheral neighbourhoods. The intended evaluation analysis lies in the techniques, the agents, the dynamics, the knowledge, and the degrees of co-production. This analysis will contribute to the lack of explicit consideration of the impacts of nature-based solutions in urban regeneration pathways, especially those related to the social fabric underlined in Dumitru et al. (2020).

Keywords

co-production; healthy corridors; nature-based solutions; peripheral neighbourhoods; Portugal; urban regeneration

1. Introduction

The transition from an industrial-based society to a knowledge-based society confirms the vital role of knowledge (Jessop et al., 2008; OECD, 1996) in the decision-making process within social and economic spheres and in continuous learning activities. Concepts such as the quintuple helix and mode three of knowledge production (Carayannis et al., 2012; Carayannis & Campbell, 2012; Gibbons et al., 1994) promote the openness of knowledge production towards new social and unconventional actors. In the case of nature-based solutions (NBS), the co-production rationale proposed is no different, and the dwellers are increasingly intertwined with public urban governance issues.

In 1988, Von Hippel's avant-garde work on the democratisation of innovation had already placed individuals and consumers in a more active position under the co-production processes of companies and universities (Von Hippel, 1988). In the social sector, the role of citizens and organisations in the provision of public services also extended the co-production boundaries (Pestoff et al., 2015). Co-production stipulates that the participation of citizens, end users or consumers, and clients, individuals or groups is crucial to the production of public services, participatory processes, and product development, respectively (Bandola-Gill et al., 2023; Brandsen & Honingh, 2018; Stott, 2018; Von Hippel, 2005). The potential partnership established between those who supply and who consume transformed the services and their results simultaneously (Von Hippel, 2005).

Overall, co-production places different knowledge in dialogue and consistent interaction. When integrated as a practical strategy for supporting social learning promoted through the interaction of a multiplicity of forms of knowledge within the governing process (Bandola-Gill et al., 2023), co-production can produce better solutions because the beneficiaries are the ones who better know their needs and, therefore, can customise their solutions. Ostrom's findings in the 1970s concluded that many public services were provided by different public or private and individual or collective actors and input from outsiders was transformed into goods and services (Ostrom, 1996). Through co-production in governance systems, social challenges are faced with plural resources, which would not be possible if citizens, private stakeholders, and public actors behaved in isolation (Pestoff, 2011). International policy recommendations, such as the *International Guidelines on Urban and Territorial Planning* (UN-Habitat, 2018), towards a more inclusive and sustainable city and society highlight this governing perspective.

It is not by chance that the European Commission's (Directorate-General for Research and Innovation [DGRI], 2015) strategy for NBS highlighted the power of collaboration and co-production (Naumann et al., 2023) as a means for designing and implementing solutions, considering their multiple benefits and added value. NBS co-production refers to multi-actors and multi-levels wherein the stakeholders are encouraged to be actively involved in courses of action for NBS (DGRI, 2015). Nevertheless, while previous projects have failed to focus critically on actual NBS co-production practices, policymakers' appropriation of these co-production approaches is still a challenge. There is a growing body of literature addressing the residual evaluation of the social dimension of its practices, effects, and impacts interwoven with NBS (Dumitru et al., 2020; Remme & Haarstad, 2022; Stijnen, 2021; van der Jagt et al., 2022). The evaluation schemes for NBS were conceptualised considering social cohesion and well-being impacts as indirect or secondary to the environment, and the absence of evidence on the distinct uses of NBS by different groups is raised by Dumitru et al. (2020).

This article examines the results of the co-production of the healthy corridor (HC) and its ongoing qualitative evaluation within the URBiNAT, a European H2020-funded project focused on inclusive urban regeneration through NBS. Qualitative methods, applied during the co-diagnostic, co-design, and co-implementation activities in the city of Porto (Portugal) and in other complementary cities provide evidence of how the various stakeholders—public authorities, local associations and citizens, municipal technicians, and academic researchers—participate in the co-production dynamic established by the project flow. The evidence seeks to address the research question: Under what conditions do co-production processes effectively promote the active involvement of citizens in urban regeneration and NBS implementation? The boundaries of a multi-relational process and multi-stakeholder are revealed with the ultimate goal of implementing HCs in peripheral neighbourhoods. This article aims to respond to the absence of analytical reflection on co-production complexity, increasing the chances of appropriation by political decision-makers.

Although the URBiNAT project uses the term *co-creation* (Caitana et al., 2020) due to the description of the call and NBS project goals (Naumann et al., 2023), the authors decided to explore the co-production concept in dialogue with the approach of this thematic issue, favouring a more encompassing term. The extensive literature on co-production and its use across a variety of fields offers strong fundamentals to validate the methodology. In addition, co-creation and co-production are often used interchangeably and they share a few commonalities (Brandsen & Honingh, 2018; Voorberg et al., 2015). Following the Brandsen and Honingh (2018) discussion, co-creation is "the newer and more slippery term" (p. 10), whereas co-production is closer to being a consolidated definition. Co-production is associated with the design and implementation phase of the production, whereas co-creation refers to the engagement of citizens in the strategic level and planning stage (Brandsen & Honingh, 2018). If we apply this lens in our empirical case, the co-production is suited to the outcomes of the HCs.

2. The Vital Role of Co-Production in Nature-Based Transformation of Urban Neighbourhoods

2.1. Definitions

The application of co-production can be observed in at least three fundamental spheres. Firstly, co-production in the private sector is seen as the means by which co-producers can produce their goods and services more efficiently and develop specific solutions for their needs (Voorberg et al., 2015). Secondly, in the scientific co-production context which assumes that political processes are shaped by scientific and technical aspects, just as technical definitions are also produced by sociopolitical pressures and powers (de Sousa Santos, 2003; Jasanoff, 2010, 2013). Thirdly, within the public sector and local governance, co-production attributes the status of citizens to individuals, who claim their positioning within active citizenship and involvement (Verschuere et al., 2012). It is aligned with the social innovation path in which civic participation is seen as a key condition for innovative policy-making processes. Co-production is also related to social innovation (Moulaert et al., 2013), as it seeks to create consistent solutions that aim to meet social needs. Thereby, it fundamentally changes social relations of power, of positions, and of rules among multiple stakeholders (André & Abreu, 2006).

The recent systematic search performed by Bandola-Gill et al. (2023) identified five different meanings of co-production across diverse disciplinary bodies of knowledge: (a) co-production as a relationship between

science and politics, anchored above all in Jasanoff's (2010, 2013) arguments mentioned previously; (b) co-production as knowledge democracy, which refers to the collaborative forms of knowledge production integrating local and indigenous perspectives; (c) co-production as transdisciplinarity, crossing different institutional settings in which different forms of knowledge are produced; (d) co-production as boundary management, focused on the usability of knowledge produced, searching for the balance between scientists' perspectives on what is useful and what is usable in practice; and (e) co-production as a research use intervention, which reflects its focus on the use of evidence in policymaking and public services (Bandola-Gill et al., 2023).

The association of the co-production approach with NBS practices thus reflects the continued flow and trend consolidated in the literature. Considering that NBS are inspired and supported by nature, providing benefits to the economy and social systems (DGRI, 2015; Frantzeskaki, 2019), they are, by themselves, co-produced, combine multiple agents and benefits, technologies, knowledge, and are implemented in specific local cultural dynamics. The multidisciplinary nature of co-production interconnects the NBS to a diverse composition of knowledge and skills, based on radical collaborations and creative energy (Alméstar et al., 2023), which gives added value to the design and implementation process of the NBS. In this way, co-production is, therefore, not only a means of implementing green solutions but also an essential part of them.

Some characteristics of wealthy NBS are the iterative processes for the adoption of a variety of disciplines and interdisciplinary and transdisciplinary modalities (Faivre et al., 2017), including opportunities for learning by doing and local adaptation. This perspective is clearly aligned with the intense and vibrant environment promoted by co-production, where the citizens are taken into account as valuable partners, for example, in the provision of services (Pestoff, 2011; Voorberg et al., 2015), in the improvement of urban space, or in the assessment of solutions.

2.2. Influencing Factors

Under the reflection on self-organisation induced by institutions, Ostrom (1996) indicates the following community attributes that determine the conditions for co-production: trust, reciprocity, reputation, sharing of values and goals among members, heterogeneity, social capital, cultural repertoire, and group size. She emphasises co-production as "the process through which inputs used to provide a good or service are contributed by individuals who are not the same organisations" (Ostrom, 1996, p. 1073). Co-production can take on different nuances and the citizens assume different roles. As co-implementers, citizen empowerment is the main goal. They are engaged at the operational stage of the service production process in order to balance their expectations and experience of the service, the citizens as co-designers to improve the quality of existing public services; and the citizens as initiators refers to users' involvement in formulating and developing both operational and strategic modes of co-production (Stott, 2018; Voorberg et al., 2015).

In order to improve co-production implementation, Stott (2018) defines four principles of co-production: inclusion, in particular, the engagement of users/groups excluded and the guarantee of accessible information; reciprocity based on mutual benefits, transparency, and power-sharing; the innovation principle oriented to the changes and to the learning experiences; and, lastly, added value based on concrete use of the initiatives and dialogue with other institutions.

From an organisational perspective, the systematic review conducted by Voorberg et al. (2015) cites the following as dominant influential factors: compatibility of public organisations with citizens' participation, open attitude towards citizens' participation, risk-averse administrative culture, and presence of clear incentives for co-production. According to the authors, one of the basic conditions, particularly in the public sector, is the infrastructure for communicating with citizens, which improves accountability strategies and makes public action more transparent. The attitude of public and political officials, directors, and municipal technicians influences the timing, location, and extent to which co-production occurs (Voorberg et al., 2015). These organisations also operate as intermediary agents who have the ability to create an adequate context of collaboration.

From a citizen's perspective, their personal characteristics determine, to a large extent, whether they are willing to participate, although individual and collective attitudes should also be considered. The greater the involvement of the citizen, the more conscious and interested in the needs of the community they are (Voorberg et al., 2015).

Other influencing factors are related to the sociomateriality approach, arguing that the materials are performative and not inert (Fenwick, 2012). In the URBiNAT project, diverse participation techniques were integrated to achieve a wider diversity of participants and their continuous involvement. However, these tools complement the human relations and sociabilities between the different parties and do not replace them. In a study about co-production dedicated to the renaturalisation of urban spaces through forest management (Campbell et al., 2016), trust appears in all cases as a central element in co-production processes. The authors themselves admitted that the boundaries between the environmental sciences and decision-making are increasingly mixed and confused, and therefore nearness requires strong bonds of trust. In addition, Pestoff (2011) argues that professionals and citizens develop a mutual and interdependent partnership, in which both parties are at risk and need to trust each other.

2.3. Limits

The goal of NBS co-production includes the experiences, views, and skills of many different stakeholders to establish long-term strategies to address specific problems jointly (Remme & Haarstad, 2022). This comprehensive description underlines the new participants in urban nature governance, new solutions, as well as the diversity of views on nature (Remme & Haarstad, 2022). However, Remme and Haarstad (2022, p. 3) found that it is "unclear whether the use of these advanced participation techniques has been able to overcome the tendency for the ideals of NBS to be subsumed under the more instrumental goals of the governance system of which these solutions are part." Additionally, there is a lack of evidence on adverse effects, in particular, the social costs of urban greening (Torres et al., 2021).

More recently, there has been a clear inclination towards successful examples of participatory NBS, leading to a lack of evidence on downsides and failures, as well as on co-production monitoring and assessment for urban NBS (Remme & Haarstad, 2022; van der Jagt et al., 2022). This then influences the quality and limits improvements that can be made to them. Moreover, political emptying (depoliticising) makes the visibility of vulnerabilities, asymmetries, and political commitment harder (van der Jagt et al., 2022).

Horizontal relations between public professionals and citizens can be complex. Public authorities or professional attitudes influence the co-production process; there may be reluctance and resistance or conceptions that citizens' behaviour is unpredictable (Voorberg et al., 2015). Another scholarly perspective corroborates the concept of "value co-destruction" proposed by Järvi et al. (2018); it means the actors involved in a partnership do not have certain resources, such as lack of information and/or inadequate communication. Failures in the interaction processes may result in a loss of trust, frustration, and a decline in the state of well-being (Järvi et al., 2018).

Despite being broadly supportive of the idea of participation, some critical perspectives have examined potential weaknesses in participatory approaches. From this standpoint, there is potential for participation to deteriorate trust if the participants do not feel their contributions or opinions made any impact (Remme & Haarstad, 2022). Although public involvement is widely recognised as crucial for the sustainability of NBS, many policymakers defend that a deeper participatory process may hinder rather than improve the development of projects (Remme & Haarstad, 2022). It is difficult to convince them to adopt a participative position. It is the reason why some NBS co-productions can emerge exclusively from a community-based perspective and adopt self-management logic.

3. Methodology

With a view to understanding co-production in its empirical diversity, this article considers the co-diagnostic, co-design, and co-implementation stage of the HC in the Campanhã civil parish, Porto, as its case study and includes comparable information from other front-runner and follower cities involved. We evaluated NBS co-production for the following reasons: as a tentative way to reveal what really happens in these scenarios of interaction; the multiple benefits from evaluation methods, such as the correction of route deviations, accountability, and a better understanding of where we are; and to strengthen the participatory dimension (citizens' voices and perception) towards knowledge-based evidence on NBS co-production.

The results of HC co-production and the ongoing evaluation research (Weiss, 1998) provide evidence of how the stakeholders participate in the relational dynamic established by the project flow. The analysis of key project task documentation, semi-structured interviews (citizens and municipal political representatives), and participating and direct observation were privileged methods. Additionally, the HC urban plan of Porto is the result of the co-production process developed in 2018 and is to be concluded in 2024. In the current stage, we can highlight some of the lessons learnt from the co-production process, through our lens as authors, researchers, and members of the Porto task force. Regarding ethical concerns, during the data collection activities, informed consent was applied and participants, also, consented orally. Interpretative and advanced analysis will be presented in Deliverable 5.6. based on the URBiNAT analytical framework.

The empirical context, described in the next section, corresponds to the co-diagnostic, co-design, and co-implementation stages, organised in order to design, decide, and implement the HC solution. The discussion is oriented around five main co-production themes: the techniques of co-production, the agents of co-production, the dynamics of co-production, the co-production of knowledge, and the degrees of co-production. The socio-material analysis (Fenwick, 2012) is particularly relevant to demonstrate the mutual implication of the social and material components for the practices of NBS co-production.

4. Results of the Co-Production of an HC Urban Plan

The co-production of the HC urban plan in URBiNAT was developed under the living labs that are local actions in the real context, activated in each community, to promote a bottom-up process, where citizens can gradually take control of the participatory process by developing solutions for their needs together with other actors (Steen & van Bueren, 2017; URBiNAT, 2021d). The activation of the living lab created the environment for co-production through the identification of actors interested in being involved, taking into consideration intersectoral, interdisciplinary, intercultural, and intersectional dimensions. This participatory process is framed by a co-production methodology that proposes an open and flexible process adapted to each participatory culture. It is organised into four interactive stages: co-diagnostic to identify the uses and needs, co-design to propose ideas and develop solutions, co-implementation to activate actions and build products, and co-monitoring to evaluate the process and monitoring the effects of NBS (Mahmoud & Morello, 2021; URBiNAT, 2021a). This path follows the modern design method steps—analyses, synthesis 1, synthesis 2, evaluation/critique, and communication (Broadbent, 1968, p. 129)—but it integrates the collaborative approach and the material and immaterial dimension of NBS. The challenge of co-producing an HC is, therefore, an opportunity to rethink the concept of NBS through a social approach. To inspire the co-production process, URBiNAT developed a living NBS catalogue that organises territorial and technological solutions, embracing products and infrastructures, and also a participatory and social and solidarity economy, comprising processes and services (URBiNAT, 2021c).

4.1. The Front-Runner and Follower Cities

The urban context, taken as an empirical object in this article, refers to an area of intervention in the Campanhã civil parish, located in the east of Porto, and comprises three main neighbourhoods (Falcão, Lagarteiro, and Cerco). This parish is an urban social housing area whose social indicators reveal the inequality faced by many inhabitants and families with low access to employment, education, health, decent housing, and public space. It is, however, a green area due to its agricultural pattern and consolidated network of social organisations and schools. Its peripherical location is stressed due to fragmentation provoked by mobility infrastructures that cut territorial relations.

The other URBiNAT cities are working in an intervention area with the same characteristics as Porto: social housing neighbourhoods located in the periphery of the cities where the population face the challenges of mobility to the city centre, lack of public transportation, informal green areas, security challenges, high level of unemployment, and lack of resources. These areas do, however, have a strong sense of belonging and an active group of citizens and associations developing social projects. Nadezhda district, in Sofia, Bulgaria, is a dense area of several social housing neighbourhoods built under the socialist regime. In Nantes, France, Nantes Nord, located in the north-western part of the city, is a large area under development by Project Globale. In Siena, Ravacciano is very close to the historical city centre; in Nova Gorica, the Koren area is on the border with the Italian city of Goricia; in Brussels, Never over Heembeck is on the border with the Flemish region; in Hoje-Taastrup, intervention areas of Gregersen Quarter are inhabited by minorities with integration difficulties. Unlike previous cases, in Khorramabad, GelSefid and Bajgiran are in the city centre and not on the periphery.

4.2. The Co-Production Pathway

The co-production steps aim to engage citizens at the three levels of commitment: involvement, interaction, and integration, from an episodical participation activity to the development and implementation of each NBS (Moniz et al., 2022). The activities were organised in parallel with adults (individuals and associations) and with school-age children from local primary schools. The compilation detailed in Table 1 refers to the project participants with different degrees and frequency. It includes associations and individual citizens that have continuously participated in project local activities since 2019 and also participants of public events. In the case of COT.CS, it is an average number, considering the turnover characteristic of the groups. More than 900 citizens were reached.

During the co-diagnostics, the activation of the living lab became a key action of the local task in order to map the local stakeholders and engage them in the project: firstly, the engagement of the Porto municipal government, through a presentation to all political representatives and heads of departments to nominate a representative in each department; secondly, a meeting with these representatives to learn more about their experience in NBS and participatory processes; thirdly, a meeting with local associations and institutions to present URBiNAT and create synergies with their local projects; fourthly, meetings with local primary schools to involve children in the identification of the needs and challenges of their territory; finally, a public meeting in the central square of Corujeira (kick-off meeting), to present URBiNAT to a wider public with activities that involved data collection and also inviting them to future activities. In parallel, researchers collected data from municipal and national surveys as well as from specific tools, including spatial analyses, health and well-being questionnaires for the population, and behavioural mapping in the intervention area. The co-diagnostic stage was challenging for the Porto task force since there was a need for full interaction between the knowledge co-produced by the local stakeholders and the knowledge produced by academics and municipalities. The co-diagnostic activities activated the living lab and established several territorial and social needs (see Table 2) that were the triggers for the co-design stage. These included green areas, pedestrian paths, lightning, autochthonous plants, play areas for children, cleanliness and maintenance of public spaces, community spaces, local economy, respect for existing memory, synergies with projects, and participatory opportunities.

The co-design is organised in seven steps, according to the methodology proposed in the co-production process: transformation to present the local diagnostic and plan activities, self-projection to prepare workshops, ideation to co-select NBS, design to develop NBS with citizens and technicians, validation of NBS in meetings with all actors, discussions of the positive aspects and challenges using the TRIZ method, and systematisation of the proposal in the urban plan. During the ideation stage, and considering the characteristics of the territory, new NBS were identified and organised into four main categories more closely connected with the municipal departments: public space and nature, culture and sports, social economy, and education and environment (see Table 2).

At the design stage, three levels of activities were adopted: (a) face-to-face proximity meetings with the citizens in order to support them and to develop the NBS adapted to the context; (b) online intermediate meetings between the participants and URBiNAT local task force to create and develop the new NBS, mitigating the challenges imposed by the Covid-19 pandemic outbreak; and (c) collaborative key meetings that brought together all stakeholders and the URBiNAT task force to discuss further and develop the proposed new NBS.

Table 1. Compilation of participants and distribution of activities during the co-diagnostic, co-design, and co-implementation stages of the HC in Porto (2019–2023).

Co-diagnostic (2019)			Co-design (2020–2021)		Co-implementation (2022–2023)		
Kick-off event	Schools	Citizens	Schools	Citizens	*Comissão de Trabalho do Corredor Saudável* (COT.CS), Working Commission of the Healthy Corridor	Working groups	Experiments
1 event	3 events	2 events	10 events	23 events	2 meetings	20 meetings	3 events
150 participants	600 participants	40 participants	200 participants	15 participants per event, on average	40 participants	30 participants	200 participants
Citizens	Primary school (6 to 10 years old)	Associations	Primary school (6 to 10 years old) + (6 events with IAAC)	Citizens, associations, and municipal technicians	Representatives of schools, city councillors, municipal technicians, and community	Representatives of schools, municipal technicians, and community	Residents, local associations, and municipal professionals

Source: Authors' work based on URBiNAT (2021b).

Table 2. Needs identified during co-diagnostic and proposal developed during co-design in Porto.

Needs (co-diagnostic)	Proposals/NBS (co-design)
	Scope: Public space and nature
Green areas and its connection to leisure and sports activities	New green multifunctional areas for leisure and sports activities New paths for cyclable circulation New NBS Culture is Health and Outdoor for Programme Activities
Better conditions of pedestrian paths	Improvement of the conditions of existing pedestrian paths Creation of new connections.
More accessible paths for all citizens	The intervention in existing paths will soften the slope and prevent stairs
Lightning	New lightning points along the paths
Qualified green areas and nature	Multifunctional urban park, wildlife park, sensorial garden, suds (retention basins), pedestrian and cycle paths, autochthonous urban forest, slope stabilisation, and expansion of urban gardens
More autochthonous plants and trees	Planting and preservation of autochthonous species
	Scope: Education and environment
Play areas for children	Multifunctional green areas where children can play Pedagogical equipment in the schools' playgrounds
Adequate cleanliness and maintenance of the public space	Municipal companies integrate new areas into their cleaning and maintenance agenda Collective cleaning initiatives with children (tested in November 2021).
Education/community/better food	Pedagogical agricultural solutions to be co-implemented in elementary schools Education living lab
	Scope: Culture and sports
Socialisation/community/ entertainment opportunities and community space improvement	Creation of safe and pleasant areas for resting, leisure, and socialisation, such as natural amphitheatres and squares Community spaces improvement More socialisation opportunities: Social market, Campanh'UP communication platform, and heritage routes
Respect existing memory	Rural walls and the trace of the Old Farmhouse of Falcão will be preserved/reintegrated New walls built respecting construction vernacular techniques Eco-construction workshops with children at schools.
	Scope: Social economy
Improve local economy	Social market named Campmarket Community kitchen Community urban garden named Germinário
Participatory opportunities	SuperBarrio app Working group activities Eco-construction activities In-situ experiments
Synergies with local projects	Connections between housing neighbourhoods and other public facilities Articulation with the public space project in the area Articulation with social project CLDS-REDES, Soalheira, Na praça, Sinergias

Source: URBiNAT (2021d).

After the co-diagnostic and co-design stages, the urban plan emerged from a process of negotiation established by a co-governance structure that organised two levels of co-production and co-decision: the working groups, constituted by the academia, the community, and the municipal technicians, to work on a monthly basis to develop projects, and the working commission with political representatives to take decisions and solve strategic challenges related to the process and the specific projects. To complete the co-implementation, a set of experiments is being organised by the working groups to present NBS to the general public and to test the solutions.

This structure was developed taking into consideration the methodological proposal of a stakeholder advisory board (URBiNAT, 2021b) to consolidate the participants' role in the participatory process and a municipal roadmap to establish the decision-making path during the co-creation of NBS. These two methods were appropriated differently in each URBiNAT city.

The URBiNAT co-production process was replicated in the other frontrunner cities—Nantes and Sofia—with HCs urban plans and effective implementation of NBS and in the follower cities—Hoje-Taastrup, Brussels, Siena, Nova Gorica, and Khorramabad—with an urban plan for the HC. Although these processes are not detailed in this text, they are reported in the urban plans (URBiNAT, 2021d, 2023) and they validate the co-production methodology tested in Porto and introduce complementarities and innovation (see Table 3).

5. Discussion

5.1. The Supportive Techniques of Co-Production

Inspired by a socio-material analysis (Fenwick, 2012), several resources were employed to support the activities. They included: maps, drawings, questionnaires, mockups, videos, catering services, communication tools (social media, webpage, and emails), minutes, reports, and flexible schedules, among others. Multiple social practices were adopted in the Porto case, encompassing, workshops, online and in-person meetings, field activities in the territorial area, direct observation, design thinking, photo voice, walkthrough, and interviews.

Although several strategies, methods, and techniques were co-designed and co-implemented, the co-production URBiNAT strategy was new for the municipality team. Previous strategies were more associated with collaborative and consultative modalities; as pointed out by the interviewees, "we are all learning" and "URBiNAT is just breaking new ground." Arguably, the co-production techniques were gradually appropriated by the different co-production agents in Porto.

The interviewees drew attention to communication strategies feeding into trusting relationships, reinforcing the opportunities to make the local population aware of the project's activities. The use of digital enablers was highlighted as part of the project strategies to achieve a wider diversity of participants and their continuous involvement. However, during the interviews, the relevance of improvements became apparent and the lack of communication with neighbourhood residents who do not participate in the project was also reported.

Table 3. Main inputs and outputs from co-production of the HC in each city.

	Inputs			Outputs	
	Co-diagnostic	Co-design	Co-implementation	Needs	NBS
Nantes	Programme citizens dialogue in the frame of the global project 130 children, 100 adults	Programme citizens dialogue in the frame of the global project 130 children, 100 adults	Urban garden	Path connections Food Place to read	Green loop Urban garden IAAC benches to read and plant
Sofia	Close contact with the social centre and school Exhibition to present local diagnostic 160 children, 370 adults	Workshop activities with 3D models	Open-air amphitheatre	Take advantage of mineral waters Innovative classroom	Mineral water swimming pool IAAC classroom and greenhouse
Hoje-Taastrup	Engagement of citizens with an experimental urban garden 17 children, 50 adults, 6 elders	Public workshop in the municipality Hall with big-scale maps	Not applicable	Connections Security Education	A bridge connecting Danish Technological Institute and Gadehavegård New urban light setting Knowledge city
Brussels	Proximity process with "ludomobile" 120 children, 45 adults, 20 elders	Workshops for intersectional inclusive public space	Not applicable	Flood protection Culture and food Play	Improve water management resilience Farm rehabilitation Playground
Siena	Living lab office at the Ravacciano association 250 children, 40 adults, 10 elders	On-site design activities with children and adults	Not applicable	Sense of belonging Socio economy	Renovation of historical water systems Solidarity market
Nova Gorica	Local activities 101 children, 3 adults	Photowalk with citizens Co-selection with NBS cards	Not applicable	Renovate Koren river	Phytodepuration swimming pool Water square
Khorramabad	Workshop with URBiNAT partners, associations, and schools 75 children, 207 adults, 110 elders	Workshops in primary schools Workshops with adults	Entrepreneurship school	Green jobs Trees in public spaces	Entrepreneurship school Planting trees

Source: URBiNAT (2021d).

5.2. The Agents of Co-Production

The creation of a local coordination mechanism (task forces) with common processes established and a high degree of co-production among institutions, knowledge, and interests represents a significant result. The task force expresses vitality, keeping the participatory process active and having managed to make co-production operational through the engagement of different municipal government departments and academic representatives. The task force covers multiple scientific areas, including natural sciences, humanities, and social sciences. Nevertheless, it results in a distribution of tasks based on expertise or institution priorities, which reveals tacit disciplinary barriers. Moreover, citizens were not represented as members of the task force, thus some relevant decisions were taken without the citizens' collaboration. Table 4 presents the distribution of roles among the task force in the different stages of the co-production process.

Table 4. The distribution of actors within the local task force in front-runner and follower cities.

	Co-diagnostic	Co-design	Co-implementation	Co-monitoring	Co-governance
Porto	Academic (coord.) Municipality	Academic (coord) Municipality	Municipality (coord.) Academic	Academic (coord.) Municipality	Municipality (coord.) Academic
Nantes	Academic (coord.) Municipality	Municipality (coord.) Academic	Municipality (coord.) Academic	Academic (coord.) Municipality	Municipality (coord.) Academic
Sofia	Academic (coord) Municipality	Municipality (coord.) Academic	Municipality (coord.) Academic	Academic (coord) Municipality	Municipality (coord.) Academic
Hoje-Taastrup	Municipality (coord.) Academic	Municipality (coord.) Academic Professional SLA Nature-based Design Studio		Municipality (coord.) Academic	Municipality (coord.) Academic
Brussels	Municipality (coord.) Academic	Municipality (coord.) Professional SLA Nature-based Design Studio		Municipality (coord.) Academic	Municipality (coord.)
Siena	Municipality (coord.) Academic	Municipality (coord.) Professional		Municipality (coord.)	Municipality (coord.)
Nova Gorica	Academic (coord) Municipality	Academic (coord) Municipality		Academic (coord) Municipality	Municipality (coord.) Academic
Khorramabad	Governmental institution (coord.) Municipality	Governmental institution (coord.) Municipality		Governmental institution (coord.)	Governmental institution (coord.)

Diverse roles and different attitudes throughout the process were identified. Participants assume roles as observers, mediators, facilitators, initiators, and coordinators. Sometimes these roles can overlap or be

mutually exchanged. At other times, the institutional roles may not be distinguished by all participants, which may be fruitful, because the meanings of the institutional roles did not influence the participatory process.

Interview results show us that at the start of the co-design stage, there was no immediate awareness of the local municipality's role as the local project coordinator. It influenced the changes in the second phase of the participatory process, in which the municipal government took the lead in the co-production process. According to the respondents, decision-makers should participate in the activities, as they exert influence on the final project and on the engagement of the residents. Despite the lack of involvement of councillors, their engagement (from three different departments) in the co-implementation meetings with citizens is, to a certain extent, a significant achievement.

Regarding the researchers' participation, focus is placed on their role as facilitators during the co-design phase as the agents who managed to gather participants' ideas, summarising the participants' contributions and incorporating this into the project progress. In relation to the interaction between researchers and the community, three researchers from CES and BIOPOLIS are named personally nine times during the interviews with citizens, which indicates continuous and frequent interaction. One of the interviewees even mentions continuous interaction with researchers within community-based activities beyond the project scope.

In relation to the community-based participants, the project objectives were to prioritise underrepresented and vulnerable groups. Within the co-design phase, priority groups were involved, including school-age children, people with special needs, and elderly residents. Nevertheless, since Campanhã is a civil parish characterised by its cultural diversity, the absence of representatives from the Roma community limits the project's inclusion goals. Despite their involvement mainly within the school context, sporadic participation in the co-design activities was noted. There is also still no evidence attesting to the involvement of citizens from the three neighbourhoods, as well as the lack of actors from business organisations which was mentioned during the interview with local public authorities. According to the respondents, the involvement of new actors will depend on local liaison and the guarantee of objective conditions for participation, for example, flexible timeline and financing opportunities were mentioned as fundamental in attracting more people.

5.3. The Dynamics of Co-Production

Overall, the participants described the workshops and meetings as welcoming sessions, with a democratic and trusting environment for presenting ideas. The methodological choices received positive feedback, in particular, the combination of moments of "reflection and practice." The citizens did not allude to moments of tension, discordance, and complaints during the negotiation of ideas and sharing of opinions. They rarely mentioned having changed their initial propositions or feeling rejection, which reinforces the evidence of a welcoming and inclusive environment for the proposals presented by the participants.

The researchers observed that almost all the meetings were moderated or led by academics or actors from municipal government. In some meetings, the public authorities and academics were the only ones personally identified and introduced, accentuating the conventional relationship between elected politicians and citizens, based on the personalisation of some and the anonymisation of others. The adoption of

bureaucratic and technical discourse by politicians, technicians, and researchers was also observed, in opposition to more socially demanding speeches by the citizens. The community participants would not have a space to lead the analysis of the process as the politicians had and could only comment on proposals somehow reduced to their needs. The research also identified inequalities in the information domain among different actors, fundamentally related to preparatory meetings held exclusively between task force members and public authorities. These meetings were vital to guarantee political commitment and informed participation but also produced unbalanced conditions.

Although the project has produced some intermediate results, the Covid-19 effects pose some challenges to its conduct. During the co-design phase, the respondents mentioned the project length, the delay, and the desire to already have some "concrete things." The interviewees raised concerns regarding the future after project completion and the professional teams leaving the community area.

5.4. The Co-Production of Knowledge

The co-production of knowledge became more than a challenge during the co-design stage, with two parallel processes that resulted in two HCs overlapping. One focused on the physical-territorial solutions to be built in the intervention area, with a licensing process and a public tender, and the second was dedicated to the social and cultural solutions that needed to be co-developed by the multiple stakeholders, within a community-driven process. The first one will be the territorial and green support for the second one, which will activate the use of public space by the local citizens.

The activities during the pandemic were mostly through online platforms, requiring a finely tuned agenda. This had the disadvantage of there being few spaces for open discussions. During the preparatory meetings, the local decision-makers revealed a prioritisation of technical projects over the needs expressed in the participatory process, that is over the issues of interest community-based. This occurs within a context marked by a conventional hierarchy of knowledge, technical advice taken as decisive in decision-making, and a certain amount of distrust of the participatory processes based on previous failure experiences. This distrust in relation to the completion of the project is also grounded in previous experiences of the citizens.

Speeches from politicians reinforced the co-production methodologies as the opportunity for municipal professionals to learn and not only the opportunity to make decisions based on different knowledge. The public authorities realised that by themselves they did not have all the information on the territory, as noted by the community too. While this is not a formal institutional practice of co-decision, it represents the inclusion of knowledge produced by the community in the municipal decision-making process.

During the co-design phase, four online meetings were organised between all stakeholders. As part of the systematisation, two meetings took place online with the citizens and the technical team using TRIZ methodology (September 2020 and January 2021) to discuss and validate the proposals. Following this approval, the urban project was developed and a draft version was presented at an online meeting with all actors (November 2020). During this meeting, citizens made comments and suggestions and developed four spaces in detail: the Old Falcão Farm as a social market with cultural activities, the space for sports activities, the sensorial garden, and the open-air auditorium. Figure 1 is an example of the use of online tools to co-design spaces.

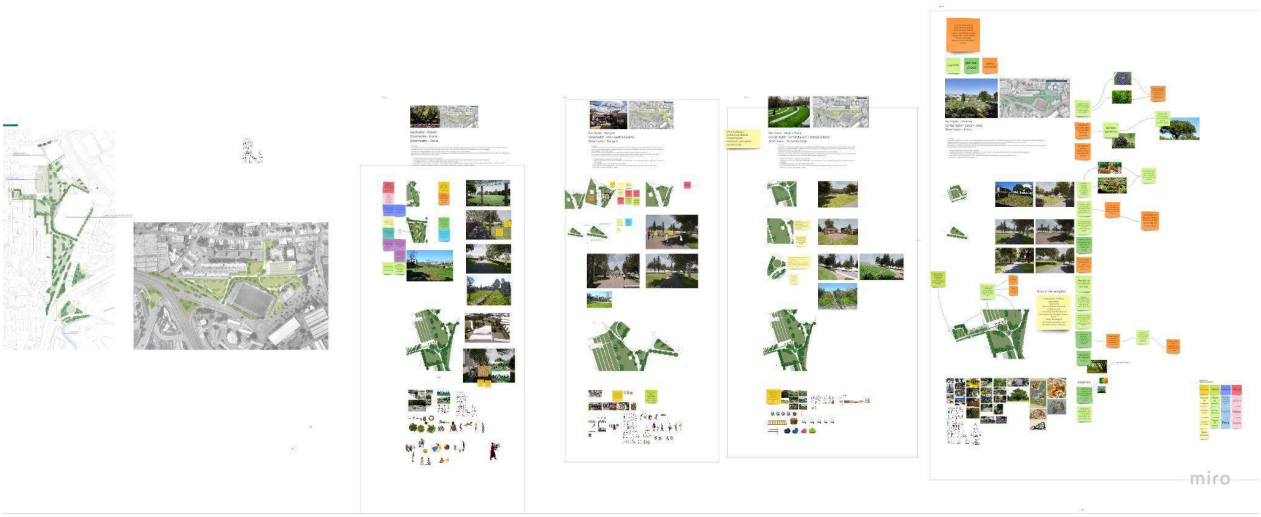

Figure 1. Online co-design meeting toward four proposals, 7 November 2020.

Beyond the online meetings, the community-based knowledge reflected in the citizens' proposals was systematised, analysed, and improved by technicians from different departments using a collaborative Microsoft Excel file. However, there were some challenges, such as the hindering of greater interaction between technicians and citizens, the difficulties of scheduling meetings, the time-consuming aspect for technicians committed to activities beyond their department responsibilities, the translation of technical terms, the technical discourses associated with a certain hierarchy of governance, and the usual interdisciplinary bottlenecks as well. Despite this, in the interviews, citizens indicated that the actions were perceived as collaborative and reinforced the desire for greater interaction with local public authorities and municipal technicians.

5.5. The Degrees of Co-Production

Considering that co-production can take on different nuances, based on the co-production of NBS projects, propose five degrees of participation: information, consultation, collaboration, co-decision, and empowerment (DGRI, 2021). Co-production begins with a degree of collaboration when the decision-making takes the stakeholders' recommendations into consideration. Under the co-decision type, cooperation with stakeholders is directed towards an agreement on a solution and implementation. Finally, the degree of empowerment means the delegation of decision-making on the project development and implementation by the stakeholders (DGRI, 2021). Other authors, such as Brandt et al. (2013), establish four levels taking into consideration 104 co-production cases analysed: information (one-way communication), consultation (closer communication, including response), collaboration (participants having notable influence), and empowerment (practitioners having decision making authority). In this way, results from the co-diagnostic, co-design, and co-implementation stages demonstrated different levels of co-production for the HCs dimensions and more opportunities for active involvement of the agents within the social and cultural solutions, as detailed in Table 5.

Table 5. Degree of co-production based on HC dimensions in Porto.

HC dimensions	NBS	Co-production stage	Degree
Social and cultural solutions	Solidarity market Campanh'UP Heritage routes Community urban garden Walks with yoga	Co-design	Co-decision
	Community kitchen Educational living laboratory	Co-Implementation	Empowerment
Physical-territorial solutions	Paths Green areas Old Falcão Farm Autochthonous forest	Co-design	Collaboration
	Retention basins Wildlife garden Natural amphitheatre	Co-implementation	Informative

In the case of URBiNAT, collaboration and informative levels occur due to the physical and territorial solution requirements being less permeable to non-technical knowledge. Co-decision and empowerment happen because social and pedagogical proposals are anchored in citizens' active involvement. The solidarity market in Porto or the urban garden in Nantes are self-organised by members of the community and local associations and can be considered an empowered initiative that emerges based on autonomy and community-based resources. The open-air amphitheatre in Porto and Sofia was proposed by the citizens in the co-diagnostic and co-design stages, but the solution was developed by the local technical teams.

6. Conclusions

In this article, co-production is viewed as vital in the nature-based transformation of urban neighbourhoods, in particular in social housing and vulnerable areas. This article aims to answer the research question of under what conditions co-production processes effectively promote active involvement of citizens in urban regeneration and NBS implementation based on empirical cases from the URBiNAT project, which gathers diverse evidence on co-production dynamics in Porto and other follower and front-runner cities. The evaluative research perspective adopted helps to unveil the particularities of the co-production process and move towards a deeper understanding of its implementation and may contribute with new narratives and new strategies to overcome limitations and barriers.

According to the bibliography validated in URBiNAT, there are many benefits from this co-production perspective, including the expansion of access, inclusion, long-term participation of multiple stakeholders, and mutual learning because it informs decision-making processes within the NBS design, implementation, and long-term stewardship, and also improves accountability strategies, thus making the process more transparent.

Participation and discussions around NBS are generally established in a positive way. The assessment based on citizens' perception (and researcher lens) has been crucial to correct deviations and to systematise lessons learnt. An example is the activation of local task forces, which has been essential for the vitality of

co-production locally; however, measures to guarantee the representation of the underrepresented groups were insufficient.

The co-production dynamics revealed a healthy environment for participation, but the levels of interaction between the different agents were not the same. The degree of co-production is influenced by a hierarchy of knowledge, demonstrated by the HC dimensions. The distrust and predominance of discursive legitimacy on technical perspectives reduced the possibilities for displacing the frontier between technical and empirical knowledge. The techniques proved to be useful in consolidating the project's co-productive path in the present; however, the concern related to the future of the HCs after the completion of the project and the professional team leaving the community area needs to be part of the corridor's transversal strategy.

To overcome the limitations of participation, international recommendations are needed to develop a participatory culture that changes the mindset of the urban planning actors. There is a need to establish management tools at a local level, such as an alderman for citizen participation (as in Brussels municipality, a URBiNAT city), local offices to promote participation (as in Nantes Metropole, a URBiNAT city), and participatory mechanisms to engage citizens, professionals, technicians, and elected representatives.

More research and future scientific frameworks to evaluate the NBS co-production practices in detail will be an occasion to explore the virtuous relation between science and the political sphere and to contribute to the amplification of the theories on urban regeneration. In fact, this kind of assessment of NBS promotes not only their improvement and politicisation but also helps NBS solutions to move closer to their main eco-social transformative goals.

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Conflict of Interests

The authors declare no conflict of interests.

References

Alméstar, M., Romero-Muñoz, S., Mestre, N., Fogué, U., Gil, E., & Masha, A. (2023). (Un)likely connections between (un)likely actors in the art/NBS co-creation process: Application of KREBS cycle of creativity to the Cyborg Garden project. *Land*, *12*, Article 1145. https://doi.org/10.3390/land12061145

André, I., & Abreu, A. (2006). Dimensões e espaços da inovação social. *Finisterra*, *41*(81). https://doi.org/10.18055/Finis1465

Bandola-Gill, J., Arthur, M., & Leng, R. I. (2023). What is co-production? Conceptualising and understanding

co-production of knowledge and policy across different theoretical perspectives. *Evidence & Policy*, *19*(2), 275–298.

Brandsen, T., & Honingh, M. (2018). Definitions of co-production and co-creation. In T. Brandsen, T. Steen, & B. Verschuere (Eds.), *Co-production and co-creation: Engaging citizens in public services* (1st ed., pp. 9–17). Routledge. https://doi.org/10.4324/9781315204956

Brandt, P., Erns, A., Gralla, F., Luederitz, C., Lang, D. J., Newig, J., Reinert, F., Abson, D. J., & von Wehrden, H. (2013). A review of transdisciplinary research in sustainability science. *Ecological Economics*, *92*, 1–15. https://doi.org/10.1016/j.ecolecon.2013.04.008

Broadbent, G. (1968). Método de projectar em arquitectura. *Arquitectura*, *103*, 129–132.

Bulkeley, H. (2020). *Nature-based solutions towards sustainable communities: Analysis of EU-funded projects*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/877034

Caitana, B., Ferreira, I., & Fonseca, P. (2020). Co-criação de soluções baseadas na natureza envolvendo comunidades e oportunidades de diálogo Europa Brasil. *Parcerias Estratégicas*, *25*(50), 189–216.

Campbell, L. K., Svendsen, E. S., & Roman, L. A. (2016). Knowledge co-production at the research–practice interface: Embedded case studies from urban forestry. *Environmental Management*, *57*(6), 1262–1280.

Carayannis, E. G., Barth, T. D., & Campbell, D. F. J. (2012). The quintuple helix innovation model: Global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, *1*(2), Article 2. https://doi.org/10.1186/2192-5372-1-2

Carayannis, E. G., & Campbell, D. F. (2012). *Mode 3 knowledge production in quadruple helix innovation systems—21st-century democracy, innovation and entrepreneurship for development*. Springer.

de Sousa Santos, B. (2003). *Um discurso sobre as ciências*. Afrontamento.

Directorate-General for Research and Innovation. (2015). *Towards an EU research and innovation policy agenda for nature-based solutions & re-naturing cities*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/479582

Directorate-General for Research and Innovation. (2021). *Evaluating the impact of nature-based solutions: A handbook for practitioners*. Publications Office of the European Union. https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/evaluating-impact-nature-based-solutions-handbook-practitioners-2021-05-06_en

Dumitru, A., Frantzeskaki, N., & Collier, M. (2020). Identifying principles for the design of robust impact evaluation frameworks for nature-based solutions in cities. *Environmental Science and Policy*, *112*, 107–116. https://www.sciencedirect.com/science/article/pii/S1462901119303314

Faivre, N., Fritz, M., Freitas, T., Boissezon, B., & Vandewoestijne, S. (2017). Nature-based solutions in the EU: Innovating with nature to address social, economic and environmental challenges. *Environmental Research*, *159*, 509–518. https://doi.org/10.1016/j.envres.2017.08.032

Fenwick, T. (2012). Co-production in practice a sociomaterial analysis. *Professions & Professionalism*, *2*(2). https://doi.org/10.7577/pp.v2i1.323

Frantzeskaki, N. (2019). Seven lessons for planning nature-based solutions in cities. *Environmental Science & Policy*, *93*, 101–111. https://doi.org/10.1016/j.envsci.2018.12.033

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge*. SAGE.

Järvi, H., Kähkönen, A.-K., & Torvinen, H. (2018). When value co-creation fails: Reasons that lead to value co-destruction. *Scandinavian Journal of Management*, *34*(1), 63–77. https://doi.org/10.1016/j.scaman.2018.01.002

Jasanoff, S. (2010). A new climate for society. *Theory, Culture & Society*, *27*(2/3), 233–253. https://doi.org/10.1177/0263276409361497

Jasanoff, S. (2013). *States of knowledge: The co-production of science and the social order*. Routledge.

Jessop, B., Fairclough, N., & Wodak, R. (Eds.). (2008). *Education and the knowledge-based economy in Europe*. Brill.

Mahmoud, I., & Morello, E. (2021). Co-creation pathway for urban nature-based solutions: Testing a shared-governance approach in three cities and nine action labs. In A. Bisello, D. Vettorato, D. Ludlow, & C. Baranzelli (Eds.), *Smart and sustainable planning for cities and regions* (pp. 259–276). Springer. https://doi.org/10.1007/978-3-030-57764-3_17

Moniz, G. C., Andersson, I., Hilding-Hamann, K. E., Mateus, A., & Nunes, N. (2022). Inclusive urban regeneration with citizens and stakeholders: From living labs to the URBiNAT CoP. In I. H. Mahmoud, E. Morello, F. Lemes de Oliveira, & D. Geneletti (Eds.), *Nature-based solutions for sustainable urban planning: Contemporary urban design thinking*. Springer. https://doi.org/10.1007/978-3-030-89525-9_5

Moulaert, F., MacCallum, D., Mehmood, A., & Hamdouch, A. (2013). *The international handbook on social innovation*. Edward Elgar.

Naumann, S., Burgos Cuevas, N., Davies, C., Bradley, S., Mahmoud, I. H., & Arlati, A. (2023). *Harnessing the power of collaboration for nature-based solutions: New ideas and insights for local decision-makers*. Publications Office of the European Union. https://data.europa.eu/doi/10.2777/954370

OECD. (1996). *The knowledge-based economy*. https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD%2896%29102&docLanguage=En

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073–1087. https://doi.org/10.1016/0305-750X(96)00023-X

Pestoff, V. (2011). Co-produção, nova governança pública e serviços sociais no terceiro setor na Europa. *Ciências Sociais Unisinos*, *47*(1), 15–24.

Pestoff, V., Brandsen, T., & Verschuere, B. (Eds.). (2015). *New public governance, the third sector and co-production*. Routledge.

Remme, D., & Haarstad, H. (2022). From instrumentalization to commoning: A critical review of participation in urban nature-based solutions. *Frontiers in Sustainable Cities*, *4*, Article 917607. https://doi.org/10.3389/frsc.2022.917607

Steen, K., van Bueren, E. (2017). *Urban living labs: A living lab way of working*. AMS-Institute. https://www.ams-institute.org/documents/28/AMS_Living_Lab_Way_of_Working-ed4.pdf

Stijnen, C. A. E. (2021). *Co-creating socially inclusive urban nature-based solutions: Towards a framework for socially inclusive co-creation processes* [Unpublished master's thesis]. Utrecht University. https://studenttheses.uu.nl/handle/20.500.12932/39931

Stott, L. (2018). *Co-production—Enhancing the role of citizens in governance and service delivery* (Technical Dossier No. 4). Publications Office of the European Union. https://european-social-fund-plus.ec.europa.eu/en/publications/co-production-enhancing-role-citizens-governance-and-service-delivery

Torres, P. H. C., Souza, D. T. P., Empinotti, V. L., & Jacobi, P. R. (2021). Green gentrification and contemporary capitalist production of space: Notes from Brazil. *Cahiers des Amériques Latines*, *97*, 185–210. https://doi.org/10.4000/cal.13550

UN-Habitat. (2018). *International guidelines on urban and territorial planning—Handbook*. https://unhabitat.org/international-guidelines-on-urban-and-territorial-planning

URBiNAT. (2019). *Report on community-driven processes to co-design and co-implement NBS*. https://cordis.europa.eu/project/id/776783/results

URBiNAT. (2021a). *Healthy corridor: Participatory process report/toolkit*.

URBiNAT. (2021b). *NBS implementation strategy: URBiNAT project deliverable 4.3*. CES.

URBiNAT. (2021c). *New NBS co-creation of URBiNAT NBS (live) catalogue and toolkit for healthy corridor: URBiNAT project deliverable 4.1*.

URBiNAT. (2021d). *URBiNAT healthy corridor concept: URBiNAT project deliverable 4.2*. CES.

URBiNAT. (2023). *URBiNAT healthy corridor urban plan of follower cities: URBiNAT project deliverable 2.7*. CES.

van der Jagt, A., Buijs, A., Dobbs, C., van Lierop, M., Pauleit, S., Randrup, T. B., & Wild, T. (2022). An action framework for the participatory assessment of nature-based solutions in cities. *Ambio*, *52*(1), 54–67. https://doi.org/10.1007/s13280-022-01772-6

Verschuere, B., Brandsen, T., & Pestoff, V. (2012). Co-production: The state of the art in research and the future agenda. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, *23*(4), 1083–1101. https://doi.org/10.1007/s11266-012-9307-8

Von Hippel, E. (1988). *The sources of innovation*. Oxford University Press.

Von Hippel, E. (2005). *Democratizing innovation*. The MIT Press.

Voorberg, W. H., Bekkers, V. J. J. M., & Tummers, L. G. (2015). A systematic review of co-creation and co-production: Embarking on the social innovation journey. *Public Management Review*, *17*(9), 1333–1357. https://doi.org/10.1080/14719037.2014.930505

Weiss, C. H. (1998). *Evaluation: Methods for studying programs and policies* (2nd ed). Prentice Hall.

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ARTICLE

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Sharing for Health, Inclusion, and Sustainability: The Co-Production of Outdoor Equipment Lending in Norway

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Abstract

This study analyses the promotion of public health, social inclusion, and environmental sustainability in two Norwegian cities through the co-production of outdoor equipment-lending outlets. Building on seminal insights from Elinor Ostrom, we investigate how the co-production of equipment-lending initiatives can bridge the divide between government, civil society, and the market. Engaging citizens in outdoor activities to promote public health, social inclusion and sustainability is a political focus area in Norway, but the activities often demand access to expensive equipment. Since the 1990s, many Norwegian municipalities have organised lending outlets for outdoor equipment, often relying on volunteer work. The emergence of BUA, a nationwide NGO aimed at engaging children and youth in outdoor activities, added the goal of environmental sustainability as a foundation for equipment-lending outlets. Additionally, it became a catalyst for the articulation of a diverse array of partnerships for the co-production of equipment lending as a public service. This study draws on fieldwork and in-depth interviews with users, staff, volunteers, and institutional partners at two lending outlets, in Kolbotn and Tromsø, in south-eastern and northern Norway. We focus on the co-production of BUA as a public service and discuss how the interplay of various actors leads to the achievement of societal and environmental goals, and subsequently how equipment-lending initiatives can facilitate collaborative consumption practices with the potential to reduce consumption.

Keywords

collaborative consumption; co-production; environmental sustainability; outdoor equipment; public health; social inclusion

1. Introduction

Addressing the challenges of sustainability in urban communities requires changes in the organisation of service provision and private overconsumption (Ostrom, 2010; Zvolska et al., 2019). Since the seminal work of Elinor Ostrom (1972), the research tradition revolving around the concept of co-production has contributed to the knowledge of how citizens contribute to the implementation of public services across many different fields (Brudney & England, 1983; Nabatchi et al., 2017; Ostrom, 1972). Today, the sustainability of private consumption is one of the most pressing issues, and this article argues that the concept of co-production has gained relevance as citizens are increasingly involved in producing sustainable services through collaborative efforts. One such initiative is the Norwegian NGO BUA, an organisation that facilitates the initiation and co-production of equipment-lending outlets in diverse contexts. Norway is among the top five countries for domestic consumption and is the top consumer of sports and leisure equipment (Aall et al., 2011; Andersen & Skumsvoll, 2019; OECD, 2022), and equipment-lending initiatives, such as BUA, are important to reduce the environmental impact of consumption as they engage citizens in sharing, reusing, and repairing (Guillen-Royo, 2023; Julsrud, 2023; Westskog et al., 2020).

Originating in the 1990s, sports and outdoor equipment-lending outlets were initiated by municipalities across the country, but the services achieved little recognition and were seldom used. In the 2010s, the Directory of Health made equipment lending a priority, with funding granted by municipalities through the Norwegian Directorate for Children, Youth and Family Affairs (Bufdir). The BUA network was established in 2014 to build visibility through a shared brand and to provide a common internet site and administrative and digital lending system. BUA is an acronym that stands for children and youth in activity (Barn-Unge-Aktivitet), and its chief societal mission is to secure participation in outdoor sports and leisure activities for children and youth. Nature-based recreation is an important part of Norwegian culture, and BUA seeks to strengthen public health, social inclusion, and environmental sustainability through its services (Erdvik & Bjørnarå, 2022; Erdvik et al., 2023; Gurholt & Haukeland, 2019). By sharing and reusing materials, BUA outlets may provide environmental sustainability to the societal goal of including more people in activities such as skiing, hiking, camping, and a wide variety of sports. Currently, the BUA network connects approximately 197 outlets across Norway's 356 municipalities (BUA, 2023; Erdvik et al., 2023).

This article investigates how BUA outlets are catalysts for diverse articulations of the co-production of lending services between public service officials, civil society actors, and volunteers. The literature on collaborative consumption often discusses the tensions between market—and civil society-driven initiatives (Fraanje & Spaargaren, 2019), but the extent to which collaborative consumption initiatives fulfil the societal and environmental goals they are set to meet remains understudied (Schor & Vallas, 2021). By focusing on co-production, we address this research gap, and provide novel insights on the potential for collaborative consumption initiatives to bridge the divide between government, civil society, and the market. This study is based on fieldwork conducted at two BUA outlets in Kolbotn and Tromsø, two cities in south-eastern and northern Norway. We base our analysis on a comparative case study design and trace the articulations of co-production strategies as they unfold across contexts. By highlighting the process of co-production at two BUA outlets, the article seeks to foster conceptual clarity while investigating a somewhat under-researched empirical area. NGOs and voluntary organisations are important actors in Norwegian outdoor life (Westskog et al., 2021), but the co-production of outdoor equipment-lending outlets is currently under-researched.

This article also engages with the contextual, cultural, and organisational factors of collaborative consumption, as has been called upon in previous studies (see Retamal, 2019; Whalen, 2018).

Building on the work of Ostrom (1972, 1996), we explored how equipment lending is co-produced to promote public health, social inclusion, and environmental sustainability. Our exploratory research question is formulated as follows: *What are the relations between co-production practices and the societal and environmental goals of BUA equipment-lending outlets in Norway?* The study is conducted as part of the Scandinavian research project UPSCALE, its main research interest being the contribution of public libraries to upscaling sustainable sharing among citizens (Jochumsen et al., 2023). BUA has sought to model itself after public libraries (Vannebo & Tjønndal, 2022, p. 109), and some of the outlets are partially run by public libraries or based in or adjacent to library buildings (Erdvik et al., 2023). Hence, we explore the role of public libraries as co-producers of equipment-lending initiatives through the case of BUA Kolbotn. With co-production as our main research interest, we focus on inter-organisational collaborations in relation to the input of citizen volunteers and BUA's users. Additional enquiry is made into the elements shaping equipment lending as a practice of collaborative consumption, as we investigate the micro-levels of interactions in relation to the goals achieved through equipment lending services.

First, we present Ostrom's theory of co-production of public services and connect it with our research objective on sustainable consumption. To investigate the possible societal outcomes of the consumption practices at the two BUA outlets, we then connect insights from the collaborative consumption literature with co-production theory. Our theoretical explorations are followed by the comparative analysis of the co-production of the BUA equipment-lending outlets in Kolbotn and Tromsø. The discussion highlights the comparative differences in co-production and establishes how equipment lending is a basis for public health, social inclusion, and environmental sustainability. To conclude we answer the research question, discuss the practical implications of our findings, and suggest future research. The research contribution provides an in-depth perspective on how the co-production of BUA's outlets positions them in the collaborative space between the government, civil society, and the market. It demonstrates that while equipment lending provides social inclusion in outdoor activities and thus benefits public health, environmental sustainability through reduced consumption is less evident.

2. Theoretical Perspectives: Co-Production and Sustainable Consumption

Heeding the call for clear definitions of co-production (Brandsen & Honingh, 2018; Petrescu, 2019), we delineate the concept and its distinction from co-creation and co-management. Ostrom and colleagues developed co-production in the 1970s at the University of Indiana's Workshop in Political Theory and Policy Analysis. While grappling with theories of governance recommending massive centralisations, Ostrom et al. (1973) did not find a single instance in which a large, centralised metropolitan police department provided better, more equitable services than smaller departments in comparable jurisdictions. Co-production recognises that public services are frequently produced in partnerships rather than by a single bureaucratic apparatus (Ostrom, 1972, 1996; Ostrom et al., 1973). Drawing on public administration discourse at the time, Brudney and England (1983) delimited co-production to citizen participation in the provision of public services through active and voluntary cooperation. Coordinated and collective efforts can potentially make co-production valuable to the community as a whole (Brudney & England, 1983, pp. 61–63). The co-production research subsequently focused on how citizens, volunteers, and clients co-produce with

government organisations to better the quality of public services and reduce costs (Bovaird, 2007; Brudney, 1993; Thomas, 1987).

Following Brandsen and Honingh (2018, p. 14), we define co-production as citizen input in the design and implementation of a service, whereas co-creation concerns the strategic planning and initiation of services. Co-management is inter-organisational collaboration in the ongoing management of public services (Brandsen & Honingh, 2018). To solve social and political challenges, local governments can co-create public services with civil society organisations and citizens (Torfing et al., 2019). BUA co-creates services with municipalities and civil society organisations, suiting equipment lending to various needs across contexts. BUA outlets are typically co-managed by the actors who co-created the lending outlet before or after the BUA organisation became a partner. Co-production is the implementation of the services by volunteers in cooperation with regular service producers, including the essential input of the users who contribute to the ongoing development of the services.

Turning to the issue of sustainable consumption and climate crisis response, Ostrom (1990) most notably researched the governance of common pool resources. Building on the earlier work on co-production, Ostrom (2010) proposed that various actors can organise service production for sustainable outcomes on multiple scales by "enabling citizens to form smaller-scale collective consumption units," utilising local knowledge and participation (Ostrom, 2010, p. 552). To highlight additional sustainability outcomes, we draw on the public management literature and the concept of value co-creation: "Value is not an objective phenomenon but is rather constructed by the customer in the context of their own experiences, expectations and needs" (Osborne et al., 2021, p. 633). BUA outlets entail co-production as an all-encompassing process—in the production of services, in the joint sphere with the users, and in the customer sphere of value co-created in use (see Grönroos & Voima, 2013; Petrescu, 2019, p. 1736).

2.1. Collaborative Consumption and Co-Production

The concept of collaborative consumption indicates practices within the sharing economy that are generally defined by the utilisation of non-owned goods or services, often facilitated by online platforms (Belk, 2014; Botsman & Rogers, 2010; Frenken & Schor, 2017). Collaborative consumption may entail environmental benefits when materials are shared and reused to reduce private consumption (Schor & Vallas, 2021). This potential to reduce the ecological impact of consumption through sharing is supported by research in Norway demonstrating how environmental motives engage people in sharing practices (Julsrud, 2023). Additionally, research points to the fact that providing spaces for citizens to experiment with sustainable consumption practices, such as sharing, exchanging, or borrowing, may upscale and consolidate practices (Sahakian & Wilhite, 2014). Contrary to current trends in service digitalisation, studies have found that positive emotions generated in face-to-face interactions when sharing materials may strengthen and maintain collaborative consumption practices (Guillen-Royo, 2023).

Analysing collaborative consumption as practice implies a focus on infrastructural, normative, and knowledge elements while accounting for the people and organisations involved (Røpke, 2009; Shove, 2003). An example is Fraanje and Spaargaren (2019), who studied collaborative consumption platforms in the Netherlands, drawing on practice-theoretical approaches. They found that in the platform-based sharing of DIY tools and household items among neighbours, a payment alternative undermined the success of a

free exchange system. When social interactions between lenders and borrowers were progressively replaced by market interactions between owners and renters, the trust and sense of "neighbourliness" vanished. In such instances, market involvement can undermine the trajectory of collaborative consumption in civil society. An insight to be drawn from this research is that organisations or companies are systems of provision that embed collaborative consumption practices in various contexts (Fraanje & Spaargaren, 2019).

The economic, cultural, and social resources supporting practice engagement are important when analysing the involvement of organisations in the co-production of lending services (see Kennedy et al., 2013). Here, we connect this insight to research on volunteer contributions in co-production as they provide the social resources supporting many sharing practices. Volunteers constitute a "category of lay actors who share common characteristics or interests," working directly with the regular service producer (Nabatchi et al., 2017, p. 770) without necessarily receiving services or benefitting directly from the organisation (Eijk & Gascó, 2018). As such, volunteers engage in co-production because of intrinsic rewards, humanitarian and altruistic values, sociality, or personal enhancement, while users or clients benefit directly from the services (Alford, 2002). Additionally, citizens who volunteer want to take responsibility for their community and identify with public purposes (Eijk & Gascó, 2018). As our analysis will show, the cultural, normative, and value-based resources provided by citizens and NGOs influence collaborative consumption practices and have a possible impact on the outcomes of equipment lending.

3. Methods: Comparative Case Study Methodology

This study draws on fieldwork conducted at the BUA outlets in Kolbotn and in Tromsø, the latter named TURBO, during 2021 and 2022. The case selection was due to both BUA outlets being partners in the research project UPSCALE. Furthermore, the cases represent typical constellations of co-producing actors involved in BUA outlets (see Erdvik et al., 2023), in which TUBRO has stronger municipal backing, while BUA in Kolbotn is co-produced with and placed inside a public library. We carried out semi-structured interviews with the organisational stakeholders, volunteers, users, and institutional partners of the two outlets. At the organisational level, interview participants include municipal staff members, Red Cross workers and volunteers at TURBO, and librarians, the BUA employee, and The Future in our Hands staff at BUA Kolbotn (eight interviews in Tromsø and seven in Kolbotn). Key interview participants had worked at the outlets since the initiation of the services as both employed staff and volunteers, while others had joined the organisations more recently. Users of various backgrounds were interviewed (16 in Tromsø and five in Kolbotn). The users included in the study represented different age groups, genders, income groups, and geographical backgrounds. There were high school and university students, parents, grandparents, long-term residents, and people new to the cities, people well experienced in outdoor activities, as well as people trying out such activities for the first time. The qualitative data is complemented by statistics from BUA on equipment lending.

The interviews with both co-producing actors and users enquired about the experiences of involvement in the BUA outlets, practices of collaborative consumption, and perceived socio-environmental outcomes. The interviews with staff and volunteers centred on how the services are organised, the inter-organisational collaborations, target groups and actual borrowers, what items are shared, and challenges faced by those involved in the service provision. We discussed their strategies for contributing to public health and social inclusion, how the services contribute to environmental sustainability, and whether equipment lending

results in reduced consumption. The interviews with users centred on their use of the lending outlets in relation to everyday practices, their reasons for taking part in the sharing services, and what the alternative to borrowing equipment would be. In addition to the interviews, we conducted participatory observations at the lending outlets during opening hours for three days at both locations. Observing the interaction among staff, volunteers, and users offered insight into the encounters taking place at the BUA outlets, and the exchange of knowledge and emotional energy mobilised in the interplay of the involved actors (see Fraanje & Spaargaren, 2019).

The method of analysis is inspired by a processual approach to comparison in case study research, as we trace the elements of practice that shape engagement in equipment lending at BUA outlets. A processual approach to comparison implies a comparative optic emphasising how processes unfold, tracing sets of relations and how they play out in distinct locations (Bartlett & Vavrus, 2017). This perspective permits a dynamic study of the co-production of lending outlets, while we also explore the data material along the comparative axis of actor constellations and outcomes.

3.1. BUA Kolbotn and TURBO: Two Cases of BUA Equipment Lending Outlets

BUA Kolbotn is located in Nordre Follo, a municipality with 58,000 inhabitants, just outside the Norwegian capital of Oslo. Kolbotn sits by a lake, surrounded by forests, adjacent to downhill and cross-country skiing areas. The municipal building named Kolben culture house, where BUA Kolbotn is located, has a café and Movie Theatre on the first floor and a public library, BUA, and other municipal services on the second floor. The BUA outlet in Kolbotn is a partnership between the Norwegian NGO The Future in our Hands (Framtiden i våre hender; FIVH), Nordre Follo public library, and the local volunteer's association, the latter two being part of the municipal public services. It was launched in 2016 as an additional service provided by the public library, with equipment kept on the library premises and the library card used to facilitate borrowing. Initially, the available equipment was intended for summer activities with canoes, bicycles, tents and sleeping bags as the most popular items. In 2017, BUA Kolbotn moved from its provisional location to one of the library's storage rooms, situated on the same floor but with an independent entrance. This room was big enough to accommodate additional equipment such as ice skates, boots, helmets, skis, and poles necessary for the practice of winter sports. In 2022, BUA Kolbotn gained access to the BUA digital lending system and featured 23rd of the BUA outlets in the country with 629 individual users borrowing 2,911 pieces of equipment (BUA, 2023).

TURBO is located in Tromsø, a city in the northernmost region of Norway which has grown from a small town to an urban city with a young and heterogeneous population of 71,000 inhabitants. The NGO Tromsø Red Cross initiated equipment lending under the name TURBO in 2013 and partnered with Tromsø municipality three years later. This meant moving from modest accommodations of one small room to the City Hall, where TURBO has been located ever since, on the ground floor between the Movie Theatre and the public library. The move increased visibility and extended TURBO's space to 76 square metres. At the time, an organisational partnership with the public library was considered, but since TURBO was already a well-functioning organisation, the perception was that a continued organisational partnership between the municipality and Red Cross would provide sufficient services. In 2019, TURBO partnered with BUA and gained access to the digital lending system, competency, and brand. Since TURBO was already an established service in Tromsø, the lending outlet did not swich names to BUA, even as the digital platform

and user interface represent the BUA system. Tromsø is a winter sports destination surrounded by impressive mountain landscapes, and the long arctic winters contribute to TURBO's largest lending category being "skis and skates," although camping gear and bicycles are also popular items. In 2022, TURBO's 3,030 users borrowed 21,548 pieces of equipment, making it the BUA outlet with the highest number of loans and users nationally (BUA, 2023).

4. Analysis

This section presents the analysis of our case studies from BUA Kolbotn and TURBO. We first introduce the relations between organisations, the characteristics of their input to the BUA equipment lending and how the lending outlets are co-created, co-managed, and co-produced through various collaborations. Then, we highlight co-production practices as interactions among service producers, volunteers and users and equipment lending as a practice of collaborative consumption. We emphasise how co-producing actors provide the resources for co-production and embed the practice in material conditions and infrastructures. The analysis results in a discussion of the comparative differences in co-production and the outcomes of equipment lending.

4.1. BUA Kolbotn: Co-production With Public Libraries

By being located within the premises of the local public library, BUA Kolbotn represents developments that are far reaching in the library field. In 2014, legislation mandated public libraries to function as social meeting places and arenas for public conversation and debate, leading to considerable diversification in library programmes and events (Audunson & Evjen, 2017), influenced by international trends of non-traditional collections such as libraries of things and tool lending libraries (see Ameli, 2017). BUA Kolbotn became part of Nordre Follo public library in 2016, and it follows that diverse services are perceived as commonplace in public libraries and adopted by librarians and many users. The library's central location in the city is also described as an asset in interviews with librarians and volunteers, and in Nordre Follo, 81 percent of residents know about local sharing services, while nine percent have used them (Julsrud, 2021).

The interview participants explained that the public library and municipal council are partners in the co-production of services through the work of librarians and provision of the premises, while the local volunteer association recruits citizen volunteers that are subsequently organised by FIVH. The general characteristics of the partnership are specified in a collaboration agreement that defines FIVH as an equipment owner responsible for managing funds. Economic resources were initially supplied only annually and were dependent on FIVH, applying to Bufdir. Therefore, the goodwill of librarians was key to the outlet when FIVH members and volunteers were not available, especially during daytime shifts. In 2022, FIVH was successful in applying for funds that, contrary to previous calls, could pay salaries and had a three-year horizon. The grant, and additional funds from Nordre Follo municipality, enabled the creation of an 80 percent position for an employee to maintain, repair, and lend equipment at the three BUA outlets. Still, the distribution of the BUA employee's time across three geographical locations necessitates continuous co-production with librarians and volunteers.

BUA Kolbotn exemplifies how equipment outlets are situated in public libraries and co-managed and co-produced with the involvement of both public service producers and civil society. The librarians provide an

essential contribution to the lending initiative, but according to the interview participants, their involvement is controversial. Public libraries are sometimes conceptualised as close cousins to the sharing economy, but the librarian's professional tradition is positioned within cultural and educational fields, with developments towards public libraries as social institutions (Hansson, 2010; Noh et al., 2019). The latter, particularly the public library's mission to promote social inclusion, is often drawn on by librarians to justify their active involvement in the daily running of BUA Kolbotn and their smooth collaboration with local volunteers.

4.2. The Practice of Co-Production at BUA Kolbotn

By being co-created through a partnership with the municipal library, BUA Kolbotn has been shaped by the infrastructure, competencies, and values of the library institution. The importance of sharing infrastructures with the library is presented by interview participants as giving visibility to the BUA outlet and by being partially run by the library, it benefits from the library's long opening hours and the availability of library staff. BUA's main societal mission also resonates with libraries' active involvement in the promotion of health and inclusion in the local population. In this regard, the librarians we interviewed emphasised how children have been able to attend summer camps by borrowing backpacks, sleeping bags, or hiking boots from the outlet and how migrant women have been able to try skiing for the first time, thanks to the equipment lent through BUA. Sharing a location also has an added benefit for the public library, as users of BUA Kolbotn often become library users and vice versa.

It was clear from the beginning that librarians had skills and knowledge in lending, registering, cataloguing, and helping citizens to navigate bureaucracy that were useful to co-producing the service. Since the initiation of the lending service, librarians have filled the role of regular service producers, handling many of the interactions with users, especially during daytime shifts when there has been little availability of volunteers. During the evenings, volunteers contribute enthusiastic and knowledgeable support to the librarians, and, as one FIVH employee explained, their participation provides citizens with a sense of ownership of the lending services:

> The citizens have more of an ownership through this type of collaboration. We could spend more municipal funding on BUA, this could be good for BUA, but it would not benefit the outlet to displace the volunteers with municipal funds. I think that would have been a great loss.

Contributing to public health, social inclusion, and environmental sustainability are the three interdependent goals cited by librarians, volunteers, and users as defining equipment lending. The BUA employee also contributes a valuable circular component through the repair and maintenance of equipment, with workshop activities taking place in the basement or at a separate location. A special emphasis on environmental sustainability at BUA Kolbotn is linked to the FIVH co-managing the services with the public library since their values revolve around environmental conservation and climate change mitigation. Furthermore, the FIVH strategically uses the traction of outdoor activities to motivate volunteers and users to engage in sustainable consumption practices. As a FIVH member puts it:

> BUA shows you how you can have all the joys and all the experiences without buying new things. I think it indirectly contributes to people accepting that environmental and climate measures don't necessitate a duller life. And that must be valued highly. Everybody loves BUA, all political parties, everybody…

The values of FIVH permeate the practices at BUA Kolbotn; however, the BUA employee acknowledges that approximately 80 percent of the equipment is bought new. Moreover, according to a FIVH volunteer, local sports shops do not recognise BUA as a competitor because sales are not affected by the equipment lending. The BUA employee envisages health and inclusion as core to the outlet's future trajectory, with the expansion of loans and territorial coverage as the main priorities. With limited donated equipment, the result may be a normative rather than a direct contribution to environmental sustainability. Still, the practices at BUA Kolbotn present an organisational trajectory conducive to the engagement of civil society in processes that reduce material consumption through sharing (see Fraanje & Spaargaren, 2019).

4.3. TURBO: Co-Production With Municipal Employees

TURBO has a physical infrastructure similar to BUA Kolbotn, with the main difference following from not being co-created on the initiative of a public library and therefore being placed adjacent to, and not within, the local public library's premises. By being co-produced without the influence of the public library, TURBO is reliant on Red Cross volunteers and strong support from the municipality, funding three employees to work part-time with the services. While the outlet's services are predicated on the presence of involved staff members, the opening hours are just three afternoons a week compared to the generous opening hours at BUA Kolbotn. Still, TURBO's success in gaining outreach in the local community is supported by it being the most used BUA outlet in the country, and in Tromsø, 62 percent of inhabitants are aware of the local lending services, while 13 percent have used them (Julsrud, 2021).

The resources, skills, and knowledge elements that are constitutive of the co-production at TURBO are dependent on the partnership between the municipality and the Red Cross. In place of librarians, Tromsø municipality has three employees working part-time as BUA staff members, together with two involved Red Cross employees and volunteers. The characteristic of the partnerships is stated in a collaboration agreement that specifies that funding from the local municipality and Bufdir is allocated for employees, rent and acquisition of equipment. The Red Cross provides funding for one part-time employee working directly with service provision, while another Red Cross employee has responsibility for recruitment of up to 13 volunteers who contribute 1,560 work hours annually. In an interview, the Red Cross recruiter explained that they place many internationals at TURBO, as it is one of the local community activities in which Norwegian is not a necessary skill. A certain adaptability to the group is required, together with a personality suited to implementing services in accordance with Red Cross humanitarian principles.

TURBO is an example of how co-creating actors initiate public services and later co-manage and co-produce with the input of volunteers and users when service provision is established. Conflicts sometimes arise between what some term the Red Cross culture and the municipal goals of increased effectiveness. In an interview, a municipal employee explained that he "thinks that the Red Cross has more focus on the role as helper. You can call it the relational part of the job." The difference in objectives was echoed in the interview with the Red Cross employee, who said, "We have a different tone when we talk to people, for example, if they have difficulties with drugs." While values and norms may diverge in some respects, the organisational goals converge at what BUA stands for, as stated proudly by the municipal employee:

> We prioritize children and youth in families with lasting low income to combat what we call exclusion. Second to this, TURBO is an incredible environmental resource through acquiring used equipment and of course we see the health benefits in our activities.

4.4. The Practice of Co-Production at TURBO

TURBO also benefits from a central location in the City Hall that contributes to its outreach, but a core part of what differentiates TURBO from BUA Kolbotn is that it constitutes a social meeting place separate from the adjacent public library. This, together with the special input from the diverse and international group of volunteers, heightens the interactive and relational quality of the practice of co-production at TURBO. Both the volunteers and many of the users share a positionality outside that of mainstream Norwegian cultural experience, and knowledge of how to access outdoor activities is discussed in accordance with the appropriate level of skills. Furthermore, several volunteers explained how TURBO meant inclusion in a community and society more broadly, while the users described feelings of trust and affinity experienced in the interactions.

In an interview, the Red Cross recruiter explained that the volunteers participate in BUA to become part of "a network, a place to be, a new friendship. If we identify our main foundation, I think it's for people to meet other people." The volunteers described how they often utilise competencies attained through work-life, whether this is administrative, customer service or other transferable skills. On the other hand, TURBO has two municipal employees contributing competencies in repair, reuse, and maintenance. These skills are transferred to volunteers to extend the equipment's lifecycle as a core circular element of collaborative consumption (Schor & Vallas, 2021). The workshop is placed within TURBO's public locales, and duties are distributed amongst volunteers who are motivated, while every participant handles the user interactions. This imparts a normative element to the collaborative consumption practice at TURBO, in which the values of reuse and repair are spread amongst volunteers and users, as explained by a municipal employee:

> Our contribution may be small in the larger context, but to raise awareness that you don't need to spend so much money on equipment to get outdoors, that you can get nice, used, fully usable equipment without buying….It's not really something I just believe, but it's the feedback from the man who came to give us his tent and said, "I use that tent two nights a year. I'll come back and borrow it when I go on a trip."

While approximately 60 percent of TURBO's equipment is bought new, as much as 40 percent comes from donations. "We no longer need to advertise," the Red Cross employee explained, since they frequently receive equipment that they repair and collect for spare parts. Interactions with users heighten the synergy of co-production as an all-encompassing process, making TURBO part of the outdoor culture and connecting it to environmental values embedded in the local community. Services are meant to be universal, and many users appreciate TURBO being a sustainable and socially acceptable alternative to unsustainable consumption. The capacity to reduce consumption is strengthened by permitting children and youth to borrow equipment for a season at a time. This provides economic sustainability to families by reducing spending on equipment that children shortly outgrow. Furthermore, this effort consolidates environmental sustainability with the goal of increased participation in outdoor activities, as lending to children often mobilises parents.

5. Discussion: Comparing the Co-Production of Two Equipment Lending Outlets

The co-production practices and the social and environmental goals achieved at BUA Kolbotn and TURBO are explored along three main comparative dimensions. These are: (1) the elements of practice that are shaped by the co-creation and co-management of the lending services by various actors, including resource inputs, and the infrastructural, normative, and knowledge elements; (2) the co-production of the service with the practices of employees and volunteers in interaction with users who engage in collaborative consumption; and (3) the outcomes of BUA's equipment lending achieved under the different co-production architectures. The comparative optic emphasises how the process of co-production unfolds by tracing sets of relations among actors in two distinct locations (see Bartlett & Vavrus, 2017).

(1): The analysis has shown that the organisations involved in co-creating BUA's services are often responsible for co-managing BUA outlets and continue to provide economic, cultural, or social resources. BUA Kolbotn has been deeply influenced by co-creation with the public library, which shaped the services both by determining the material infrastructure and providing the services with the values and norms of the library institution and the professional competencies of the librarians. The co-management with FIVH and the co-production of services with its employees and volunteers connect the practice of equipment lending to the values of environmental sustainability. While TURBO's economic resources are provided by comparatively similar channels (e.g., Bufdir and municipal funds), the social and cultural resources are rooted in the Red Cross's humanitarian principles rather than the public library as a social institution or FIVH's goals of environmental conservation and climate change mitigation. The combination of the municipal goals of effectiveness and Red Cross humanitarian ideals with an international group of volunteers may be the grounds for success. The stronger link between TURBO and local volunteers is a result of the Red Cross's key role in co-managing and co-producing the service. TURBO also benefits from stable input from municipal employees contributing knowledge in maintenance and repair, while the BUA employee in Kolbotn is split between outlets.

(2): Comparing the practice of co-production and how this relates to collaborative consumption is a micro-level study of social interactions across localities. We build on the notion that face-to-face interactions may strengthen and maintain collaborative consumption practices (Guillen-Royo, 2023; Sahakian & Wilhite, 2014), and suggest that the character of interactions is contingent upon both the physical space in urban communities and the actors upholding the practices through labour, norms, and values. The close connection to the public library at BUA Kolbotn connects the services to the librarian's professional aim as members of a social institution, while the environmental values of FIVH permeate the interactions with the users, resulting in service that the users experience as both equitable and environmentally sustainable. Compared to TURBO, however, the space for user interactions and socialising among volunteers is limited, and in contrast to BUA Kolbotn, the volunteers at TURBO are engaged in the repair and maintenance of equipment. By having the workshop in the same locale as the lending service, the circular aspect of BUA's equipment lending is also more pronounced at TURBO. At both BUA outlets, volunteerism serves a twofold purpose, as participants are integrated into society through co-production while contributing a collective effort with potential benefits to the community as a whole (Brudney & England, 1983).

(3): Concerning public health, social inclusion, and environmental sustainability, our analysis provides convincing evidence that the BUA outlets achieve the goal of contributing to the inclusion of children, youth,

and many adults in outdoor sports and leisure activities. Engaging people in outdoor activities is a base for public health (Gurholt & Haukeland, 2019), and it follows that BUA might contribute considerably to this societal goal as well. Concerning environmental sustainability, the limited amount of donated equipment at BUA Kolbotn and the goal of increased loans and territorial coverage might imply the purchase of additional outdoor equipment, thus generating adverse environmental impacts. At TURBO, the outcome of environmental sustainability is a potentiality resulting from the co-production of services with municipal employees who contribute the skills and knowledge to extend the lifecycles of the equipment through maintenance, reuse, and repair. TURBO is a vibrant meeting place, and the practice contains knowledge transfer and a normative and social element that supports environmental sustainability. The lending service has also been operational longer than BUA Kolbotn, which might explain the stronger support from the local community in the donation of equipment. Still, a significant amount of equipment is bought from commercial actors.

The limited capacity to reduce material consumption through equipment lending is supported by a representative survey in Nordre Follo, Tromsø, and three other municipalities. Among those who had previously loaned equipment, 62 percent reported that borrowing from others or buying second-hand would be among the alternatives to borrowing from outlets (Julsrud, 2021, p. 14). While direct environmental benefits are contestable, the normative element of the collaborative consumption practices makes the re-use and repair of equipment a part of outdoor activities. This entails co-production as an all-encompassing process, and for BUA's equipment lending, the value co-created in use is participation in outdoor recreation and the added benefit of doing good for the environment, as experienced by many of the users we interviewed.

6. Concluding Remarks

This article has presented an analysis of the co-production of equipment lending at two Norwegian locations. Against the backdrop of the overconsumption of sports and leisure equipment, the article provides insights into the research question: *What are the relations between co-production practices and the societal and environmental goals of BUA equipment-lending outlets in Norway?* Equipment lending provides social inclusion for children, youth, and many adults to participate in outdoor activities and might provide a substantial benefit to public health. While the evidence for environmental sustainability through reduced consumption is inconclusive, the practice of collaborative consumption supported by BUA outlets might impact people's attitudes towards utilising shared and used equipment. The role of public libraries has also been explored, and the case of BUA Kolbotn exemplifies how libraries can contribute greatly to the co-production of equipment-lending initiatives. The practical implications of the study imply that regular service producers with skills in repair and maintenance and support from local communities in the donation of equipment are crucial to the goal of positive environmental impact from equipment lending.

Drawing on co-production theory and practice-theoretical approaches, the article has provided novel insights into the co-production of outdoor equipment-lending outlets and the contextual, cultural, and organisational factors of collaborative consumption. By delineating the differences between co-creation, co-management, and co-production, both theoretically and in our analysis, the article attempts to sharpen the conceptual understandings of co-production. The comparative approach contributes valuable insights by showing how the co-creating actors provide the resources, infrastructures, and material conditions of the

BUA outlets. The actors co-managing the outlets subsequently provide continual support and the norms and values that orient the practices related to the service. Co-production directs attention to the input of citizens and volunteers in the implementation of public services, as collaborations between public, private, and ideal organisations uphold many of the social practices that shape society. This is what Ostrom and her colleagues discovered in the 1970s, and our analysis relied on the potency of this conceptual framework in providing an in-depth perspective on collaborative consumption as an important and emerging social phenomenon.

BUA outlets are positioned in a collaborative space between the government, civil society, and the market. They represent what Ostrom (2010) terms smaller-scale collective consumption units, relying on local knowledge and participation in the provision of sustainable consumption as a public service. As a relatively new part of welfare architecture, popular support and citizen involvement in the co-production of lending services might be necessary to upscale and consolidate such practices. Our research contribution is limited to critically examining the claims regarding the various societal impacts of the actors engaged in the co-production of equipment lending at two BUA outlets and the benefits experienced by the users. Future studies are needed to ascertain the actual environmental impact of BUA's lending services. In the context of Norway's high consumption of sports and leisure equipment, it is urgent to understand how the co-production of outdoor equipment-lending outlets can facilitate collaborative consumption practices that support environmental sustainability.

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Conflict of Interests

The authors declare no conflict of interests.

References

Aall, C., Klepp, I. G., Engeset, A. B., Skuland, S. B., & Støa, E. (2011). Leisure and sustainable development in Norway: Part of the solution and the problem. *Leisure Studies*, *30*(4), 453–476. https://doi.org/10.1080/02614367.2011.589863

Alford, J. (2002). Why do public-sector clients coproduce? Toward a contingency theory. *Administration & Society*, *34*(1), 32–56. https://doi.org/10.1177/0095399702034001004

Ameli, N. (2017). Libraries of things as a new form of sharing. Pushing the sharing economy. *The Design Journal*, *20*(sup1), S3294–S3304. https://doi.org/10.1080/14606925.2017.1352833

Andersen, B. L., & Skumsvoll, N. F. (2019, June 5). Vi bruker 15 milliarder i året på utstyr: Stiene har blitt en catwalk [We spend 15 billion a year on equipment: The trails have become a catwalk]. *NRK*. https://www.nrk.no/vestfoldogtelemark/nordmenn-bruker-15-milliarder-i-aret-pa-sportsutstyr-1.14575621

Audunson, R., & Evjen, S. (2017). The public library: An arena for an enlightened and rational public sphere? The case of Norway. *Information Research*, *22*(1). http://www.informationr.net/ir/22-1/colis/colis1641.html

Bartlett, L., & Vavrus, F. (2017). Comparative case studies: An innovative approach. *Nordic Journal of Comparative International Education*, *1*(1), 5–17. http://doi.org/10.7577/njcie.1929

Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, *67*(8), 1595–1600. http://doi.org/10.1016/j.jbusres.2013.10.001

Botsman, R., & Rogers, R. (2010). *What's mine is yours: The rise of collaborative consumption*. Harper Business.

Bovaird, T. (2007). Beyond engagement and participation: User and community coproduction of

public services. *Public Administration Review*, *67*(5), 846–860. https://doi.org/10.1111/j.1540-6210.2007.00773.x

Brandsen, T., & Honingh, M. (2018). Definitions of co-production and co-creation. In T. Brandsen, T. Steen, & B. Verschuere (Eds.), *Co-production and co-creation: Engaging citizens in public services* (pp. 9–17). Routledge. https://doi.org/10.4324/9781315204956

Brudney, J. L. (1993). Volunteer involvement in the delivery of public services: Advantages and disadvantages. *Public Productivity & Management Review*, *16*(3), 283–297. https://doi.org/10.2307/3380871

Brudney, J. L., & England, R. E. (1983). Toward a definition of the coproduction concept. *Public Administration Review*, *43*(1), 59–65. https://doi.org/10.2307/975300

BUA. (2023). *Utlånsrapporten 2022* [The lending report 2022]. https://www.bua.no/aktuelt/utlansrapporten-2022

Eijk, C. V., & Gascó, M. (2018). Unravelling the co-producers: Who are they and what motivations do they have? In T. Brandsen, T. Steen, & B. Verschuere (Eds.), *Co-production and co-creation: Engaging citizens in public services* (pp. 63–76). Routledge. https://doi.org/10.4324/9781315204956-8

Erdvik, I. B., & Bjørnarå, H. B. (2022). *BUA-nettverkets omdømmeundersøkelse: Resultater fra 2022* [*The BUA network's reputation survey: Results from 2022*] (Report No. 19–2022). NORCE. https://hdl.handle.net/11250/2999153

Erdvik, I. B., Reymert, I., Hellang, Ø., Espegren, A., & Ervik, R. (2023). *Kunnskap om virkning og drift av utstyrssentraler: Delrapport 1: Rammevilkår og drift* [Knowledge of the effect and operation of equipment centres: Interim report 1: Framework conditions and operation] (Report No. 2023:1). Centre for Research on Civil Society and Voluntary Sector. https://hdl.handle.net/11250/3064410

Fraanje, W., & Spaargaren, G. (2019). What future for collaborative consumption? A practice theoretical account. *Journal of Cleaner Production*, *208*, 499–508. https://doi.org/10.1016/j.jclepro.2018.09.197

Frenken, K., & Schor, J. (2017). Putting the sharing economy into perspective. *Environmental Innovation and Societal Transitions*, *23*, 3–10. https://doi.org/10.1016/j.eist.2017.01.003

Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, *41*(2), 133–150. https://doi.org/10.1007/s11747-012-0308-3

Guillen-Royo, M. (2023). 'I prefer to own what I use': Exploring the role of emotions in upscaling collaborative consumption through libraries in Norway. *Cleaner and Responsible Consumption*, *8*, Article 100108. https://doi.org/10.1016/j.clrc.2023.100108

Gurholt, P. K., & Haukeland, P. I. (2019). Scandinavian friluftsliv (outdoor life) and the Nordic model: Passions and paradoxes. In M. B. Tin, F. Telseth, J. O. Tangen, & R. Giulianotti (Eds.), *The Nordic model and physical culture* (pp. 165–181). Routledge. https://doi.org/10.4324/9780429320187

Hansson, J. (2010). *Libraries and identity: The role of institutional self-image and identity in the emergence of new types of libraries*. Chandos Publishing.

Jochumsen, H., Julsrud, T. E., Mathiasson, M. H., Solum, E. E. B.-D., Guillen-Royo, M., Førde, A., & Bakkevoll, S. E. (2023). UPSCALE: Upscaling sustainable collaborative consumption using public libraries. *Nordic Journal of Library and Information Studies*, *4*(1), 94–105. https://doi.org/10.7146/njlis.v4i1.138194

Julsrud, T. E. (2021). *Bærekraftig deling i norske kommuner: Status og nye muligheter* [Sustainable sharing in Norwegian municipalities: Status and new opportunities] (CICERO Policy Note; 2021:01). CICERO Center for International Climate Research. https://hdl.handle.net/11250/2737245

Julsrud, T. E. (2023). Sustainable sharing in local communities: Exploring the role of social capital. *Local Environment*, *28*(6), 811–827. https://doi.org/10.1080/13549839.2023.2179611

Kennedy, E., Krahn, H., & Krogman, N. T. (2013). Taking social practice theories on the road: A mixed-methods

case study of sustainable transportation. In M. J. Cohen, H. S. Brown, & P. J. Vergragt (Eds.), *Innovations in sustainable consumption* (pp. 252–276). Edward Elgar. https://doi.org/10.4337/9781781001349.00023

Nabatchi, T., Sancino, A., & Sicilia, M. (2017). Varieties of participation in public services: The who, when, and what of coproduction. *Public Administration Review*, *77*(5), 766–776. https://doi.org/10.1111/puar.12765

Noh, Y., Ro, J.-Y., & Jeong, D.-K. (2019). A study on users' perception of the role of library in the sharing economic era in Korea. *Library Hi Tech*, *38*(3), 654–677. https://doi.org/10.1108/LHT-01-2019-0015

OECD. (2022). *OECD environmental performance reviews: Norway 2022*. https://doi.org/10.1787/59e71c13-en

Osborne, S. P., Nasi, G., & Powell, M. (2021). Beyond co-production: Value creation and public services. *Public Administration*, *99*(4), 641–657. https://doi.org/10.1111/padm.12718

Ostrom, E. (1972). Metropolitan reform: Propositions derived from two traditions. *Social Science Quarterly*, *53*(3), 474–493. https://www.jstor.org/stable/42860228

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073–1087. https://doi.org/10.1016/0305-750X(96)00023-X

Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, *20*(4), 550–557. https://doi.org/10.1016/j.gloenvcha.2010.07.004

Ostrom, E., Parks, R. B., & Whitaker, G. P. (1973). Do we really want to consolidate urban police forces? A reappraisal of some old assertions. *Public Administration Review*, *33*(5), 423–432. https://doi.org/10.2307/974306

Petrescu, M. (2019). From marketing to public value: Towards a theory of public service ecosystems. *Public Management Review*, *21*(11), 1733–1752. https://doi.org/10.1080/14719037.2019.1619811

Retamal, M. (2019). Collaborative consumption practices in Southeast Asian cities: Prospects for growth and sustainability. *Journal of Cleaner Production*, *222*, 143–152. https://doi.org/10.1016/j.jclepro.2019.02.267

Røpke, I. (2009). Theories of practice—New inspiration for ecological economic studies on consumption. *Ecological Economics*, *68*(10), 2490–2497. https://doi.org/10.1016/j.ecolecon.2009.05.015

Sahakian, M., & Wilhite, H. (2014). Making practice theory practicable: Towards more sustainable forms of consumption. *Journal of Consumer Culture*, *14*(1), 25–44. https://doi.org/10.1177/1469540513505607

Schor, J. B., & Vallas, S. P. (2021). The sharing economy: Rhetoric and reality. *Annual Review of Sociology*, *47*, 369–389. https://doi.org/10.1146/annurev-soc-082620-031411

Shove, E. (2003). Converging conventions of comfort, cleanliness and convenience. *Journal of Consumer Policy*, *26*, 395–418. https://doi.org/10.1023/A:1026362829781

Thomas, J. C. (1987). Neighborhood coproduction and municipal productivity. *Public Productivity Review*, *10*(4), 95–105. https://doi.org/10.2307/3380253

Torfing, J., Sørensen, E., & Røiseland, A. (2019). Transforming the public sector into an arena for co-creation: Barriers, drivers, benefits, and ways forward. *Administration & Society*, *51*(5), 795–825. https://doi.org/10.1177/0095399716680057

Vannebo, B. I., & Tjønndal, A. (2022). 5. Sosialt entreprenørskap og inkludering: BUA som bærekraftig samskapingsaktør [5. Social entrepreneurship and inclusion: BUA as a sustainable co-creation actor]. In A. Tjønndal, A. K. Lund, & M. Nilssen (Eds.), *Bærekraft i idrett og friluftsliv* [Sustainability in sports and outdoor life] (pp. 103–120). Scandinavian University Press. https://doi.org/10.18261/9788215061153-2022-05

Westskog, H., Aase, T. H., & Leikanger, I. (2021). The Norwegian trekking association: Conditions for its

continued existence with new tourism patterns. *Scandinavian Journal of Hospitality and Tourism*, *21*(3), 341–359. https://doi.org/10.1080/15022250.2021.1913219

Westskog, H., Aase, T. H., Standal, K., & Tellefsen, S. (2020). Sharing among neighbours in a Norwegian suburb. *Environmental Innovation and Societal Transitions*, *37*, 39–49. https://doi.org/10.1016/j.eist.2020.07.010

Whalen, S. (2018). "Foodsharing": Reflecting on individualized collective action in a collaborative consumption community organisation. In I. Cruz, R. Ganga, & S. Whalen (Eds.), *Contemporary collaborative consumption: Trust and reciprocity revisited* (pp. 57–76). Springer.

Zvolska, L., Palgan, Y. V., & Mont, O. (2019). How do sharing organisations create and disrupt institutions? Towards a framework for institutional work in the sharing economy. *Journal of Cleaner Production*, *219*, 667–676. https://doi.org/10.1016/j.jclepro.2019.02.057

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Co-Production for Equitable Governance in Community Climate Adaptation: Neighborhood Resilience in Houston, Texas

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Abstract

As urban areas grapple with the pressing impacts of climate change, fostering community-level resilience becomes imperative. Co-production, emphasizing active stakeholder engagement, offers a pathway to robust, equitable, and inclusive adaptation strategies. This article delves into the co-production processes within neighborhood resilience planning in Houston, Texas, revealing how collaboration between communities, planners, and municipal leaders can address climate vulnerabilities and support disadvantaged groups. Through an empirical analysis of three Houston neighborhoods, the study evaluates co-production's role in promoting neighborhood-scale adaptive capacity and reshaping power dynamics to advance equity and environmental justice. The results highlight the significance of local institutions and the necessity of municipal commitment to co-production efforts. The study contributes actionable insights on the application of co-production in neighborhood climate adaptation, emphasizing the need for direct municipal engagement to implement transformative spatial projects and rebalance governance frameworks for effective climate action.

Keywords

capacity building; climate adaptation; co-production; environmental justice; Houston; neighborhood resilience; urban governance

1. Introduction

1.1. Co-Production, Institutions, and Climate Adaptation

Urban centers confronting the urgent impacts of climate change must adopt robust, equitable, and inclusive strategies. Co-production has risen as a key approach for enhancing resilience and governance, especially at

the neighborhood level, by fostering collaboration among municipal leaders, communities, and planners to address vulnerabilities and support disadvantaged groups (Anguelovski et al., 2016; Huybrechts et al., 2017; Intergovernmental Panel on Climate Change, 2021; Shokry et al., 2023; Wolf & Mahaffey, 2016; Woodcraft et al., 2020). This study examines the role of co-production in climate adaptation initiatives at the neighborhood level in Houston, Texas. Given that urban design and institutional management of public spaces are crucial for community resilience, incorporating community resilience into socio-spatial design and management of public spaces, including utilities, is pivotal for creating sustainable urban futures that are guided by local knowledge (Kousky, 2021; Lotfata & Munenzon, 2022). Such insights can help develop strategies that reflect community knowledge, leading to transformative actions (Klenk et al., 2017; Sovacool et al., 2016; Swart et al., 2023; Woodcraft et al., 2020).

Co-production distinguishes itself from participatory planning by engaging stakeholders in managing and creating public services, following Ostrom's (1996) concept of active stakeholder engagement in the creation of public goods and services (see also Wyborn et al., 2019). It aims to include diverse perspectives, address power imbalances, and drive societal change (Turnhout et al., 2020). Yet, effective co-production faces challenges such as maintaining participant engagement and, critically, overcoming institutional barriers to transformative outcomes (Jagannathan et al., 2020). Co-production in neighborhood resilience and adaptation planning is about generating knowledge and engaging with power dynamics and political structures. This study investigates co-production's impact on community adaptive capacity and power dynamics, focusing on Houston's Neighborhood Resilience Planning (NRP). It assesses how the NRP promotes equity and environmental justice through institutional and capacity-building initiatives in climate adaptation (Mees et al., 2018; Turnhout et al., 2020).

1.2. Environmental Justice and Decision-Making

In pursuing community-focused, equitable climate adaptation, it is essential to comprehend the nuances of co-production and intersectional planning. This approach emphasizes the integration of local knowledge and the leverage of the power-holding institutions (Fitzgibbons & Mitchell, 2019; Kirkby et al., 2018; Lotfata & Munenzon, 2022; Murray & Poland, 2020; Poland et al., 2021). Participatory design and urban resilience are essential components of effective climate adaptation, which requires a deep understanding of the underlying power dynamics (Meerow et al., 2016).

Adopting an intersectional lens in participatory processes can lead to more inclusive collaborations, bridging the gap between traditional decision-makers and community members, thus empowering marginalized groups (Arnstein, 1969; Buckingham-Hatfield, 2000; Crenshaw, 2013; Oteros-Rozas et al., 2015; Ruiz-Mallén, 2020; Schlosberg, 2007). In this context, co-production emerges as a critical tool in addressing intersectional inequities and bolstering urban resilience (Eidt et al., 2020; Joshi & Moore, 2004). Yet, pre-existing inequalities often obstruct truly inclusive co-production. Redefining power dynamics is central to this effort, paving the way for more resilient urban communities (Bremer & Meisch, 2017; Jasanoff, 2004; Muñoz-Erickson et al., 2017; Ruiz-Mallén, 2020; Van Kerkhoff & Lebel, 2015; Wamsler, 2017). The six co-production modes proposed by Chambers et al. (2021) aim to empower marginalized voices by redistributing power, which is crucial for their active participation (Bixler et al., 2022; Wamsler, 2017).

Hardy et al. (2017) argue for a paradigm shift in climate change and sea-level rise science, advocating for an integrated approach where policy questions and scientific research reciprocally influence each other. This shift includes incorporating race-aware adaptation planning from the outset, acknowledging the historical conditions that have led to uneven racial development and vulnerability. Similarly, Jacobs (2019) emphasizes the need for a deeper focus on community knowledge and environmental practices in disaster planning to address systemic oppression. Advocates such as Hardy et al. (2017) and Jacobs (2019) call for a shift in climate science and planning to acknowledge historical inequities and integrate community-centric insights, enriching adaptation strategies with diverse perspectives. This study seeks to refine the application of co-production in urban adaptation, aiming to inform strategies that align with equity and sustainability, thereby serving as a guide for future resilient urban development.

1.3. Houston Case Study

Houston's approach to urban planning, marked by a lack of zoning and a tilt towards market-driven development, has led to significant environmental justice concerns (Qian, 2010). Post-Second-World-War expansion, driven by annexation policies, often sidelined equitable infrastructure in favor of commercial interests, resulting in disparate municipal service provision (Fisher, 1989; Gray, 2022). Communities of color have faced historical neglect and environmental risks, with responsibilities for maintenance frequently shifted onto already marginalized residents (Korver-Glenn et al., 2017; Schuetz & Kanik, 2023).

The 1990s saw the introduction of "super neighborhoods" to empower local decision-making. However, hampered by resource constraints and a lack of government support, these initiatives fell short, mirroring the broader trend of public service privatization (Vojnovic, 2003). This governance model often forces civic clubs and grassroots entities to shoulder the advocacy and implementation of local infrastructure projects (Fisher, 1989; Qian, 2011).

Hurricane Harvey's impact in 2017 laid bare the heightened vulnerabilities of minority communities situated in high-risk areas, calling attention to the urgent need for policy reforms to address deep-seated planning inequalities (Hendricks & Van Zandt, 2021). This article explores the NRP project within Houston's distinctive governance context, advocating co-production to address historical inequities and champion equitable climate adaptation. The study highlights the need to foster inclusive decision-making and dismantle systemic obstacles to cultivate resilient, equitable urban communities.

1.4. Study Goals

This research is dedicated to developing a framework for evaluating co-production processes in community climate adaptation across three neighborhoods in Houston, Texas, focusing on rebalancing power dynamics for equitable climate adaptation. The study investigates the effectiveness of co-production in NRP for fostering local capacity building and reshaping governance and power structures. The research employs empirical methods to analyze the NRP process's first year, particularly the dynamics between community members, the City, and consultancy teams. A comparative analysis across neighborhoods enhances understanding of co-production's role in resilience, revealing the diverse impacts of community dynamics and urban challenges on localized climate adaptation strategies. It aims to understand the interplay between spatial challenges, governance, decision-making, and the creation of robust community-based institutions.

Guided by frameworks from Bremer and Meisch (2017) and Chambers et al. (2021), this study seeks to understand co-production's role in building resilience capacity at the neighborhood scale.

2. Analytical Framework: Enhancing Capacity and Equity Through Co-Production

The study explores how neighborhood resilience plans can enhance capacity building, promote equity, and scrutinize interconnections between spatial challenges and decision-making. Utilizing Bremer and Meisch's (2017) normative lenses of public service, institutional, and empowerment, and Chambers et al. (2021) co-production modes, the framework critically assesses the co-production process, aiming to identify necessary shifts in the balance of power and agency. Additionally, it examines the role of institutions in fostering equity and environmental justice, recognizing the need for substantial funding, regulatory reform, and collaborative governance for successful urban resilience and climate-ready infrastructure (Huybrechts et al., 2017). This study aims to identify processes that promote power brokering and reframing by examining how co-production modes contribute to institution building.

2.1. Conceptual Grounding: Climate Risk, Environmental Justice, and Intersectional Planning

Effective climate adaptation demands equitable and intersectional planning that boosts adaptive capacity and confronts the deep-rooted injustices that influence societal dynamics (Bixler et al., 2022; Kirkby et al., 2018; Murray & Poland, 2020; Poland et al., 2021). These systemic inequities heighten climate vulnerabilities, making it imperative to incorporate social and demographic considerations into adaptation strategies (Hoffman et al., 2020). Hardy et al. (2017) argue that overlooking historical contexts in climate planning perpetuates environmental racism, adversely affecting marginalized groups. Conversely, acknowledging past injustices can lead to more resilient mitigation efforts. A shift towards climate justice is essential, advocating for race-aware adaptation that addresses power disparities and racial inequities from the outset (Lotfata & Munenzon, 2022; Ruiz-Mallén, 2020).

Co-production empowers communities to articulate their adaptation priorities and contribute their insights, challenging the limitations of conventional vulnerability assessments. Jacobs (2019) underscores the value of community-driven expertise in identifying challenges, critiquing the academic tendency to assign "social vulnerability" labels without authentic community interaction. Adaptation solutions must navigate the power dynamics that shape vulnerabilities to achieve environmental justice, ensuring inclusive decision-making processes (Arnstein, 1969; Schlosberg, 2007). This involves enhancing adaptive capacity through strategies ranging from land use modification and improved access to public services to strengthening community agency (Intergovernmental Panel on Climate Change, 2021). On a local level, this translates to fostering knowledge creation, amplifying underrepresented voices, and building trust to enable resource sharing and innovation (Pelling & High, 2005; Siders, 2019).

The neighborhood scale is identified as a critical site for reinforcing grassroots institutions. Chambers et al. (2021) highlight "reframing power" and "brokering power" as key modes for establishing new organizations and collective action. A comprehensive strategy to bolster adaptive capacities might involve urban design, capacity-building, and advocating for institutional and governance reform. This approach marries environmental improvements with community empowerment and equitable governance, including creating green spaces, modernizing infrastructure, and educational programs, all while supporting community

organizations. Nonetheless, broader institutional and governance reforms are necessary, including policies that ensure access to resources, transparent decision-making, and acknowledgment of intersectional challenges. Figure 1 depicts the relationship between co-production actions and stakeholders through institutional mechanisms.

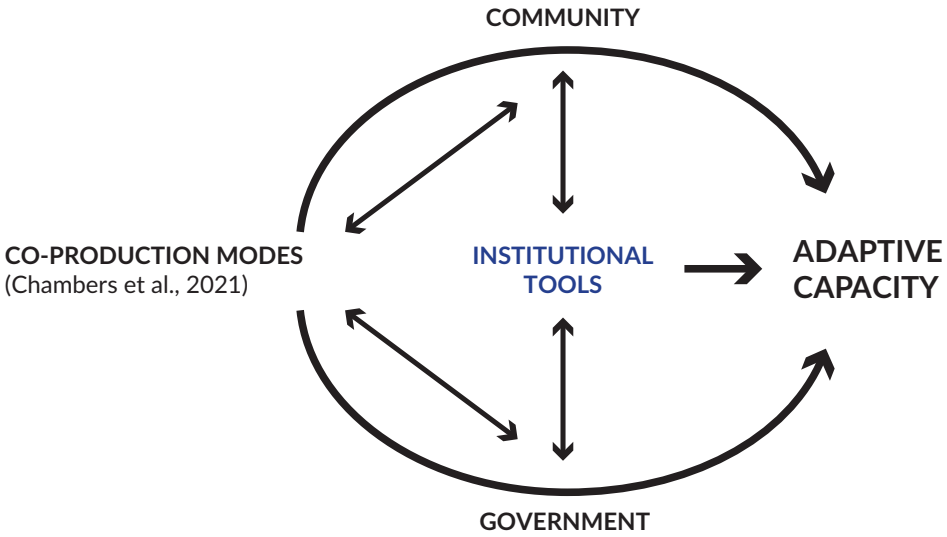


Figure 1. Framework for identifying co-production actions related to the relationships between capacity building and the community and governmental institutions.

2.2. Empowering Communities in Climate Adaptation: Co-Production, Power Dynamics, and Resilience Planning

For effective climate adaptation, resilience planning should facilitate participatory processes that promote genuine power-sharing and inclusivity in decision-making (Arnstein, 1969; Bixler et al., 2022; Fitzgibbons & Mitchell, 2019; Poland et al., 2021). An intersectional lens enriches the understanding of climate impacts and cultivates collaboration that challenges established power structures (Huybrechts et al., 2017; Teli et al., 2020; Turnhout et al., 2020). Hardy et al. (2017) call for a race-aware approach to planning that addresses racial disparities in vulnerability and development by incorporating historical insights. While immediate outcomes of co-production can be evident, achieving broader systemic change is often more complex, requiring steadfast engagement and the dismantling of institutional obstacles to enable meaningful policy transformation (Jagannathan et al., 2020). Examples from Durban (Wamsler, 2017) and London (Teli et al., 2020) illustrate the potential of inclusive strategies to empower communities and foster co-production.

Nonetheless, the transition from dialogue to transformative action can be hindered by systemic inertia. Studies from various ecosystems, such as the Great Barrier Reef, highlight the necessity for governance frameworks that incorporate diverse perspectives and avoid reinforcing existing inequalities (Jagannathan et al., 2020). Co-production tools such as the spectrum of community engagement to ownership help elevate community participation towards shared governance, fostering trust and accountability, as seen in the Providence Climate Justice Plan (City of Providence Office of Sustainability, 2019; see also Gonzalez, 2019). Likewise, the spectrum of community-led approaches encourages community empowerment through capacity building and relational investment, promoting democratic governance reforms (Attygalle, 2020).

Co-production is a dynamic process that, when applied thoughtfully within political and governance contexts, can lead to equitable and sustainable climate resilience outcomes underpinned by empowered communities and responsive institutions.

Figure 2 presents a model for enhancing engagement through various community-centric approaches—owned, driven, shaped, and informed—each differentiated by its degree of co-production, governance style, resource allocation, and methodologies employed. This model incorporates frameworks such as Gonzalez's (2019) spectrum of community engagement to ownership and Attygalle's (2020) spectrum of community-led approaches. These frameworks emphasize the significance of co-creative processes, the reinforcement of institutional resilience, and the integration of communities' experiences and expertise in shaping policy, thus promoting sustainable and equitable outcomes. The model excludes the "community-informed" approach, which involves consultation to adapt initiatives to local needs. This approach was not included as it aligns more with top-down governance models, which do not fit the participatory and egalitarian principles conveyed in the diagram.

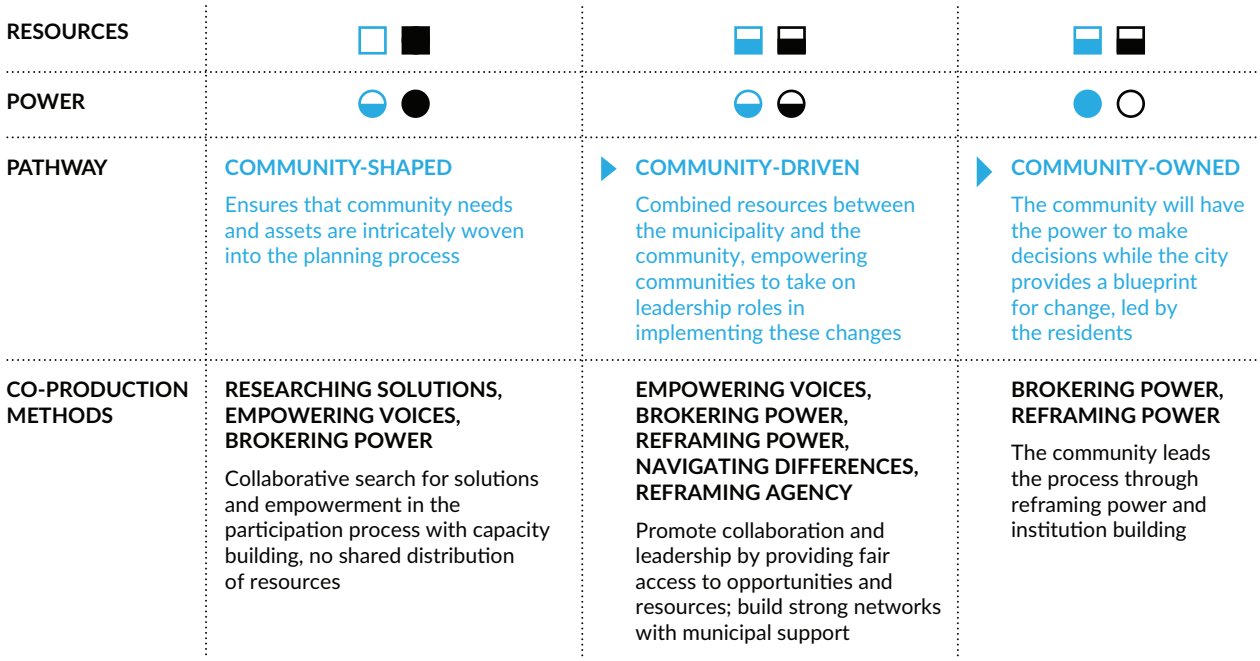


Figure 2. Pathways of community participation and co-production modes and methods. Notes: Community is indicated in blue and municipal government in black; the square symbol designates resources and the round symbol power.

Spatial actions require community-based institutional support, involving "navigating differences" and "reframing agency" modes (Chambers et al., 2021) and addressing spatial and historical inequities. Genuine government commitment is vital for equitable access and influence and is affected by higher-level institutional actions (Huybrechts et al., 2017). Neighborhood-level strategies require organizational development and knowledge about implementation and policy, employing "brokering power" and "reframing power" modes to transform governance through co-production.

2.3. Institutional and Political Capacities for Equity and Environmental Justice

Navigating the complexities of community and political landscapes for co-production requires skillful negotiation and the creation of frameworks that support collaborative governance (Huybrechts et al., 2017). The efficacy of co-production lies in its ability to foster grassroots participation, adapt to shifting policies, and undertake strategic institutional actions. Building local capacity is crucial to incorporating community perspectives within decision-making processes and tackling systemic inequities (Akerlof et al., 2023; Jagannathan et al., 2020).

Innovative governance models, participatory grant-making, and peer networks are instrumental in aligning organizational governance with community aspirations and enhancing transformative potential (Lodato & DiSalvo, 2018). Collaboration between municipal actors and community-based organizations is essential for equity planning and environmental justice, as they are critical in directing local investment and fostering community-led initiatives (Figure 2). Co-production propels institutional change and improves societal involvement and understanding (Huybrechts et al., 2017). Furthermore, co-production acts as a conduit for critique and political evolution and is capable of utilizing and reshaping existing institutional structures to challenge entrenched norms. "Commoning," proposed by Teli et al. (2020), emphasizes grassroots economic models and community engagement, catalyzing change and power redistribution. For successful climate adaptation, it is imperative to connect community-based organizations to essential resources, enabling them to actively participate in city planning and advocacy, thus ensuring that local voices guide relevant actions.

The diagram in Figure 3 displays a pathway of gradual change that combines different scales of community, government, and non-profit institutions. The steps to achieve this combination are knowledge production, relationship building, accessing resources, and adjusting power dynamics. The diagram outlines the process, its tools, and micro-institution creation. It shows links between the government and the community working to

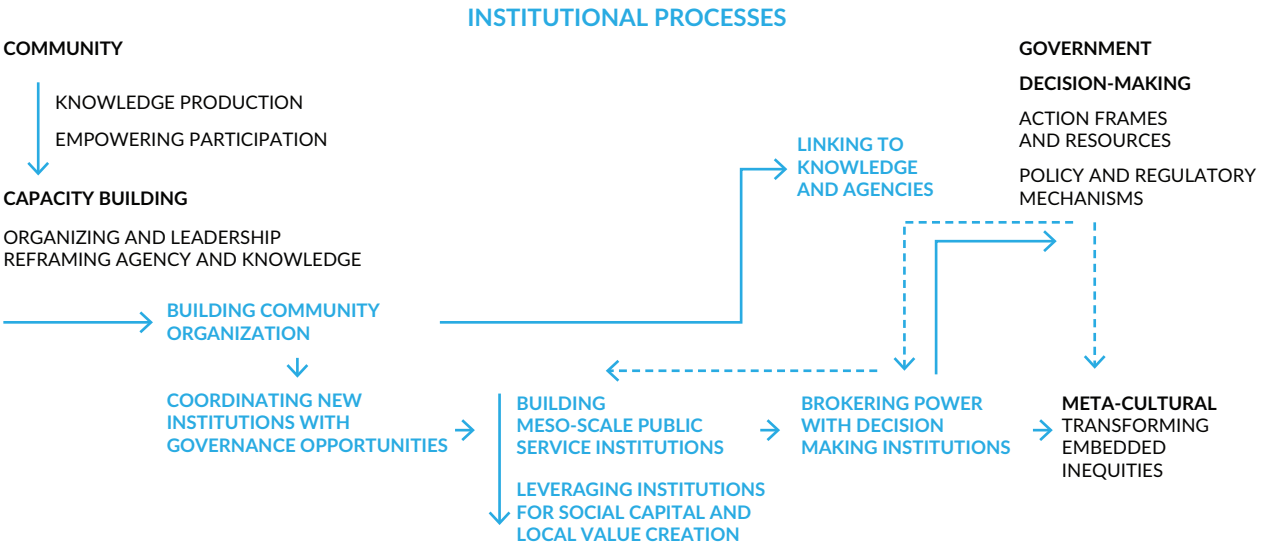


Figure 3. The role institution building process in advancing adaptive capacity and potential power shift. Focusing on brokering and reframing power between micro-communities and macro-governments by scaling up institutions and actions to enable co-production.

advance the process. The process begins with engaging community leaders and connecting them with agencies and professionals, allowing them to access professional knowledge and improving transparency in government decision-making. The co-production process also permits the creation of organizations that mitigate gaps in public services, such as neighborhood patrols or a local green infrastructure maintenance workforce. A critical aspect of this process is addressing "meta-cultural frames" (Huybrechts et al., 2017). These frames refer to the wider cultural and social norms and values that influence institutional policies and practices. Adaptation planning can challenge the existing power relations and promote social justice by creating inclusive spaces where marginalized groups can voice their concerns and participate in decision-making that directly affects their lives. By adopting this approach, the objective of a power shift is not just a theoretical concept, but it becomes a practical strategy for cultivating equitable climate adaptation and resilience.

3. Methods

3.1. Overview of the Case Study

This study explores the development of the Houston NRP project, aimed at crafting community-centric climate adaptation strategies (City of Houston's Planning and Development Department, 2023). As part of Mayor Turner's resilience plan following Hurricane Harvey, the project initiated a pilot in Independence Heights, East Houston, and Edgebrook to develop a replicable framework (City of Houston, 2020). In 2022, the NRP was funded by a Community Development Block Grant, facilitating collaboration between the City of Houston's Planning and Development Department, the Mayor's Office of Resilience and Sustainability (City of Houston's Planning and Development Department, 2023), and a multidisciplinary consultant team. Spearheaded by One Architecture and Urbanism, Community Lattice, and the Black United Fund of Texas facilitating community co-production, the team undertook this process from January 2022 to April 2023, focusing on resilience and climate adaptation planning, underpinned by vulnerability analysis and strategic planning.

The three Houston neighborhoods targeted by the NRP pilot were chosen for their heightened vulnerability to flooding and historical challenges with disaster recovery (City of Houston's Planning and Development Department, 2023). Selection criteria were established by the Mayor's Office and the Planning and Development Department. These criteria were based on data that indicated repetitive loss from floods, communities that housed vulnerable populations, and those that had experienced hindered post-disaster recovery due to ineffective assistance (Griego et al., 2020). The NRP underscores capacity building to empower communities through education and outreach, enabling them to navigate recovery, comprehend individual risks, and interact effectively with local government. Building support from various sectors, including city, non-profit, and philanthropic entities, is crucial for the success of community-based initiatives (City of Houston's Planning and Development Department, 2023).

The NRP's methodology, framed by the City of Houston's Planning and Development Department and its consultant team, utilized the municipal super neighborhood (SN) boundary to define each neighborhood's geographical expanse. SN offered communities access to a suite of resources, services, and decision-making mechanisms as a governance tool, bringing together residents, property owners, businesses, faith groups, and others intimately tied to the locality (Vojnovic, 2003). For this project, each community established a neighborhood support team (NST) conceptualized by the Planning and Development Department. This team of community ambassadors and multi-sector representatives was pivotal in

formulating neighborhood-tailored resilience plans, liaising with city officials, and broader outreach. A Technical Advisory Committee, consisting of professionals from various sectors, including city agencies, philanthropies, businesses, and other experts, lent their expertise to inform and support potential strategies, ensuring a holistic and coordinated approach to resilience planning (see Figure 4 for the project stakeholders). While this process follows traditional resilience planning efforts, the main goal of focusing on co-production was capacity building, aimed at bolstering social resilience and adaptive capacity, with the intention of bridging the gaps resulting from a history of disinvestment and the City's laissez-faire philosophy (Fisher, 1989; Qian, 2011; Vojnovic, 2003). Community capacity building, an essential aspect of this endeavor, involves leveraging existing resources and creating new ones to deepen community capacities for resilience strategies.

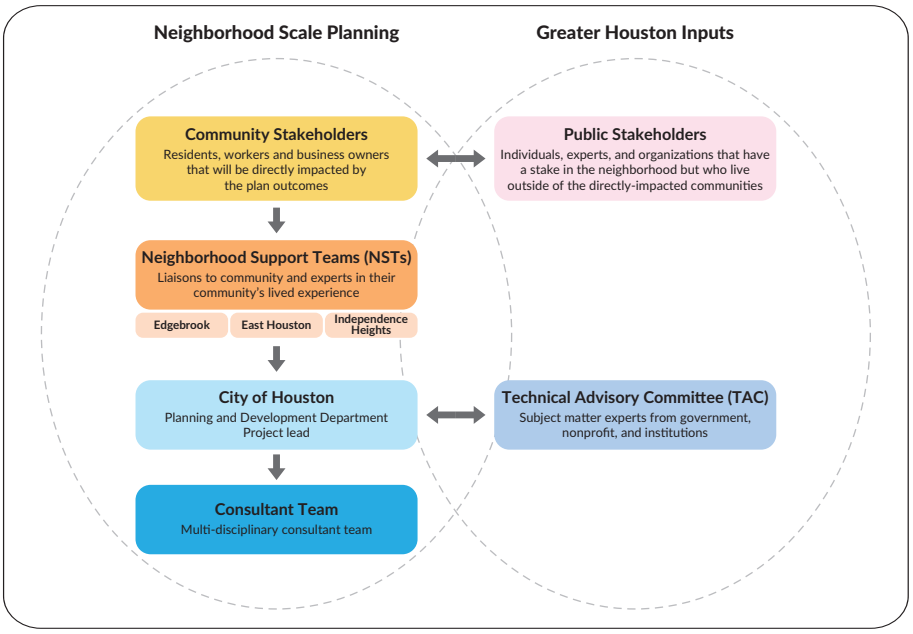
To initiate the planning process (in 2022–2023), the City, in collaboration with the consultant team, designed a Community Participation Plan. To form the NST, the community liaisons engaged various stakeholders: SN representatives, faith leaders, civic clubs, community development entities, local activists, nonprofits, and other interested residents. Across 12 months, NST members attended four co-production and three public meetings, disseminated city surveys to their respective communities, and invited representatives from the Planning and Development Department and the consulting team to their community events:

- East Houston conducted four NST meetings (two virtual), hosted four public meetings (one virtual), ran six interactive NST member workshops (meet people where they are at various events), and organized three outreach events as extensions of other community programs;
- Independence Heights held all four NST meetings virtually, four public meetings (with one virtual), six NST member workshops, and three community program-driven outreach events;
- Edgebrook executed four virtual NST meetings, four public meetings (one virtual), four NST member workshops, and six outreach initiatives, which included two door-knocking campaigns for awareness and four integrated SN activities;
- The NST meetings, Technical Advisory Committee workshops, and public meetings were scheduled for two hours.

The NSTs consisted of community leaders and sector representatives, each reflecting its neighborhood's unique characteristics and needs. Edgebrook's NST, comprised of six residents, focused on enhancing understanding of flood risks and local governance, highlighting a collective ambition for stronger political representation and improved city services. East Houston's NST, with five members representing a mix of community organizations, faced challenges in attracting city investment and a deep-seated skepticism that the City would fulfill its promises. Independence Heights' NST, comprising five members from varied leadership roles, grappled with gentrification and preservation concerns, expressing a need for genuine city support in their resilience efforts. Independence Heights, having a legacy as Texas's first African-American municipality in 1915, is anchored by powerful grassroots entities (Pruitt, 2005). NST members expressed concerns about historical neglect, the pressing need for long-term resilience planning, and a desire for authentic engagement from the City.

During the initial series of NST meetings, participants included representatives from the Planning and Development Department, the consulting team, an observer researcher, and selected NST members. As stated by the consultant facilitator, the primary objective was to comprehend the community's ongoing

a The NRP process and participants from the NRP final guidel by City of Houston.



b Process sequence and timeline from the NRP raplicable framework by City of Houston.

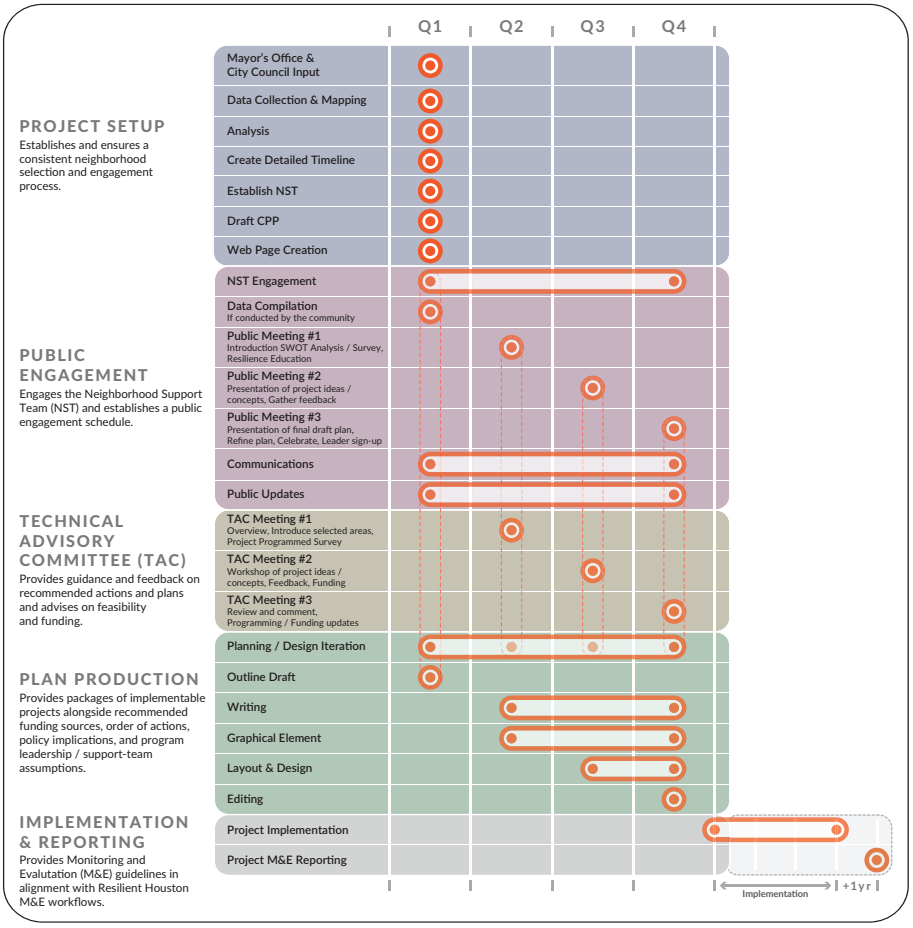


Figure 4. NRP process and timeline based on groups of stakeholders and participants in the co-production process.

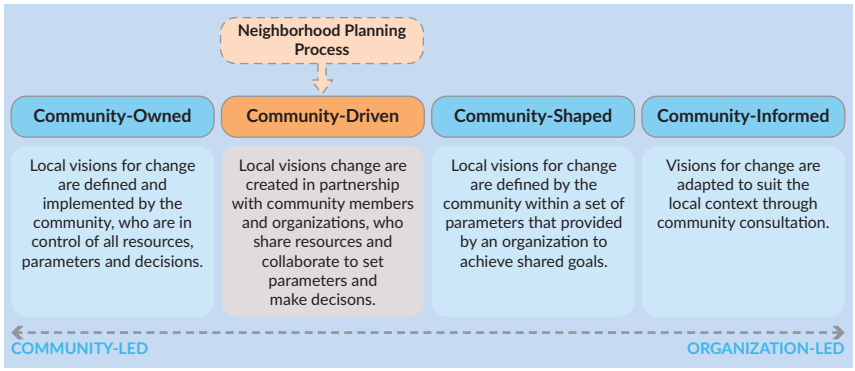
efforts to bolster their neighborhood's adaptive capacity, discern their priorities, and cultivate trust. The subsequent meetings emphasized validating data assembled by the consulting team, concentrating on prior unsuccessful planning endeavors and a risk vulnerability assessment. Typically, vulnerability assessments employ pre-existing data sources, such as census demographics and social vulnerability indices (Jurgilevich et al., 2017). Through these early workshops, community stakeholders and NST members cross-referenced and validated this data, accentuating the significance of community-centric knowledge creation in discerning neighborhood vulnerabilities (Hendricks et al., 2018). A post-Hurricane Harvey recovery group member pointed out notable limitations in the accessible spatial and socio-economic data, particularly concerning certain overlooked disinvestment challenges. This challenge becomes significant when dealing with recurring flooding issues, highlighting the need for comprehensive community-led knowledge production (Mohtat & Khirfan, 2021).

Furthermore, during the first series of NST meetings, a listening session was dedicated to discussing the goals of the plan and the priorities that each neighborhood deems essential to their resilience and ability to adapt. The City and expert team presented the NST groups with the following goals: (a) integrating city-wide initiatives and funding at the local level, (b) implementing projects that have the most significant resilience benefits for neighborhoods, (c) identifying funding sources that communities can access directly, and (d) promoting community cohesion. Emphasis was placed on systemic challenges prevalent in the neighborhood, as these are fundamental to building resilience beyond addressing immediate flood risks.

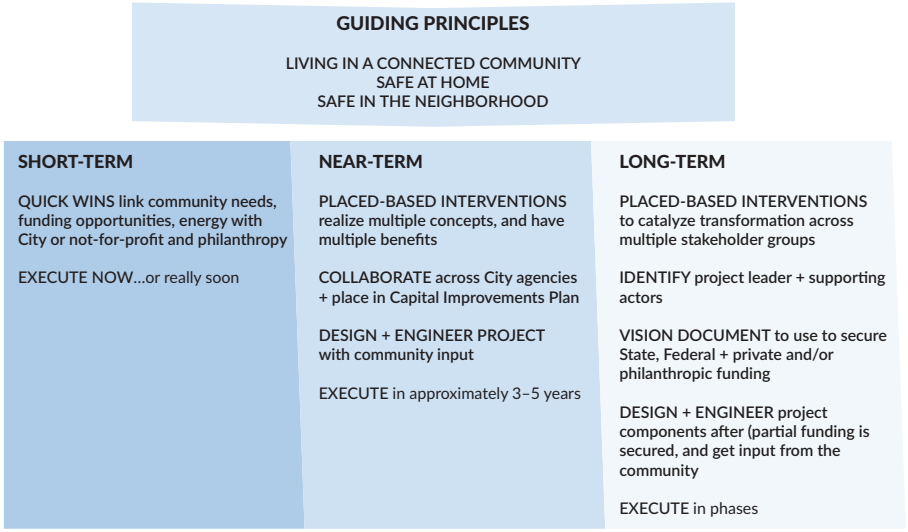
The process of co-production with the NST representatives and other community stakeholders was presented by the Planning and Development Department and consultant team. As framed by the team, the four phases of the planning process started with the vulnerability assessment, current and past planning initiatives, and identifying which needs were prioritized. This was followed by visioning sessions and brainstorming strategies to address the identified spatial and operational issues. The third phase aims to frame place-based and project-based investments across three stages: short-term initiatives for immediate implementation, near-term projects achievable in a few years, and long-term projects that require substantial coordination, funding, and construction, all based on the vision and priorities set by the community.

The initial phase of Houston's NRP centered on aligning with the community-driven pathway outlined by Attygalle (2020), promoting sustained collaboration, strategy development, and joint decision-making (Figures 2 and 5A). The City's proactive engagement with various agencies and City Council members aimed to directly address community concerns, exemplified by Independence Heights' inquiries about 311 call center operations and Edgebrook's calls for an increased police presence. These discussions enabled mutual learning and empowered community leaders with strategic planning knowledge, fostering a comprehensive understanding of municipal programs for grant applications and resource access. Based on NST member conversations, it has been observed that some individuals or groups were not being included in certain decision-making processes despite their desire to participate. For example, when the tax increment reinvestment zone was established in East Houston, many attendees advocating for the initiative were left out of the final board. NST members expressed a desire for the City to play a strategic role in building partnerships between organizations and linking to regional agencies. They also expected that the City would be an active and responsive partner.

a The Attygale community participation spectrum and the adopted pathway from the NRP final guidel by City of Houston p. 9.



b Guiding principles for the plan strategies according to phases and complexity from the NRP final report by City of Houston p. 42.



c Open drainage ditches from East Houston, NRP Final report by City of Houston.

Figure 5. Images from the final NRP report for East Houston as shared on the website Let's Talk Houston: (a) The team's stated goal for the project is to achieve capacity building through the community-driven pathway and build partnerships with the government for decision-making and resource sharing, as shown in Figure 2; (b) phasing of projects and interventions based on project complexity and implementation time; (c) open drainage ditches are common across city neighborhoods and maintenance is critical to their effectiveness.

However, jurisdiction and responsibility have been a source of conflict between local and regional agencies. Historically, marginalized communities lacked essential city utilities. When drainage was introduced, the City chose cost-effective methods that burdened residents with maintenance. This neglect and shifted responsibility exacerbated drainage issues in these areas over time (Schuetz & Kanik, 2023).

In this longitudinal qualitative case study on Houston's resilience planning, the research primarily focuses on how these initiatives enhance community capacity, strategic efficacy, and equitable progress. The study probes into the interdependencies of spatial challenges, governance, decision-making, and the potential of established systems to develop robust, community-led institutions to rectify power disparities and foster adaptive capacity.

This manuscript analyzes the first year of the NRP process and the pilot project data from 2022–2023 in three neighborhoods. The study examines the planning process, including the strategies, resources, leadership, and institutions required for implementation. The researcher was embedded with the consultant team and analyzed which concepts succeeded in the final document and why. This qualitative case study provides continuous observation, offering insight into co-production and planning. Embedded research is a collaborative approach to urban planning that merges academic research with field practice. This synergy ensures that theoretical knowledge aligns with real-world applications (Odongo & Ma, 2021; Parnell & Pieterse, 2016). The research analyzed unstructured participatory observations from in-person and virtual meetings, which were recorded and summarized through meeting minutes. Formal materials, draft proposals, comments, and final documents were also reviewed.

3.2. Data Collection and Analysis

The study's data analysis primarily relied on an empirical and observational approach to determine how co-production mechanisms impact power dynamics and aid community capacity building in Houston's NRP. The research focused on closely observing and analyzing the resilience project's practical co-production and development phases to identify the facilitators and barriers to the co-production process. The goal was to uncover the governance frameworks required for successful implementation (Burns, 2014; Hensel & Nilsson, 2016). Data was collected through active participation in and observation of in-person and virtual meetings, including NST meetings, Technical Advisory Committee workshops, and public meetings. This comprehensive data collection process involved reviewing meeting minutes, recorded sessions, surveys, and project reports, all contributing to a nuanced understanding of the community–government dynamics within the resilience planning process (Baxter & Jack, 2008; Birch, 2012; Yin, 2014).

The NST meetings were the primary data source for the analysis of the co-production process and capacity building in the observational exploratory case study. Actions and priorities from these meetings were categorized into three normative lenses: public service, institutional, and empowerment (Bremer & Meisch, 2017). In this study, knowledge co-production principles are the underlying philosophies, values, and normative frameworks that guide the process across societal levels. This analytical method provides a detailed understanding of the collaborative generation of knowledge, its participants, and the resultant impacts. It highlights the importance of shared governance and the reallocation of power. The full participation of diverse stakeholders in co-production activities is encouraged. The actions were then compared to the modes of co-production identified by Chambers et al. (2021), allowing an evaluation of the

dynamics of agency and power. This assessment is crucial for monitoring the project's progress. The initial categorization in Table 1 aims to identify which actions and strategies signal a need for—or result from—a shift in the balance of power, resources, and agency, as evidenced by the City's commitment. Further analysis segmented these actions according to the institutional scales defined by Huybrechts et al. (2017), shedding light on the supporting institutions behind each action and the necessary reallocations of resources and power discerned from the discussions and the final report of the project. This categorized data enriches our comprehension of how co-production can recalibrate power dynamics, a concept visualized in Figure 3.

4. Results

4.1. Co-Production of Climate Adaptation-Focused Actions

This thematic analysis delves into the co-production of resilience strategies, underscoring the imperative to align public services with community-defined visions for resilience and adaptive capacity. It calls for a decisive commitment from Houston's leadership to advance beyond the City's traditional developer-centric planning and for active engagement with local resource allocation and power dynamics to cultivate solid and responsive institutions (Fisher, 1989; Jagannathan et al., 2020; Qian, 2011; Vojnovic, 2003). Utilizing the lenses of institutional structure, public service, and empowerment defined by Bremer and Meisch (2017), we categorize challenges and plot solutions, advocating for transparent public investments and the mobilization of local actors to shape their public spaces. This approach is predicated on fostering synergistic dialogue among city officials, consultants, and NSTs to ensure that initiatives align with community aspirations and contribute to a conducive shift in the power dynamics toward enhanced resilience.

In East Houston, the NST spotlighted salient concerns in the aftermath of Hurricane Harvey, such as escalating flood risks, a shortage in public service capacity, and a dire need for infrastructural renewal to bolster community resources and commercial viability (George, 2017). City officials have suggested participatory planning measures to enable residents to directly influence their neighborhood's growth trajectory. Simultaneously, Edgebrook's NST intends to amplify its community's capacity to navigate post-disaster recovery, with a keen focus on risk literacy and empowered local governance advocacy. Independence Heights, grappling with housing security and neighborhood character preservation, faces challenges from gentrification development and bureaucratic delays in planning controls. The prevalent development trend of subdividing lots for new townhomes leads to displacement and loss of historic significance (Fox, 2000). The community's efforts are geared toward establishing conservation districts to protect cultural assets, with the City showing intent to support these initiatives and to develop affordable housing solutions (Zuvanich, 2023).

The maintenance of stormwater drainage ditches was central to the discussions across neighborhoods, recognized as a linchpin for flood prevention but plagued by neglect. The burden of their upkeep has been shifted onto residents (Blackburn & Bedient, 2018; Rackleff, 2015). Efforts to fortify the communication channels between NST members and city representatives have led to more transparent maintenance protocols and reduced illegal dumping incidents.

The NST meetings underscored the importance of uniting community members and organizational leaders around a shared vision for neighborhood resilience. Conflicts arose where new organizations established

post-Hurricane Harvey were seen to receive preferential resource allocation over existing groups. The consultant team focused on guiding NST discussions towards actionable and resilient neighborhood strategies, emphasizing "navigating differences" to prepare for effective co-production and capacity building within each community.

The synthesized Table 1 from these discussions draws on the analytical models from Figures 1 and 2, distilling the essence of NST dialogues into a focused examination of action-oriented priorities. It scrutinizes the power dynamics and the allocation of resources between the communities and governmental entities while explicitly excluding the broader relational lenses of "researching solutions" and "navigating differences" by Chambers et al. (2021). This targeted assessment illuminates the actionable strategies with the potential to recalibrate the community's power structures and resource access, reflecting the City's level of commitment and providing a roadmap for future engagement and policymaking.

City-recommended actions in NST forums, such as establishing SNs and management districts and enacting local ordinances, align with the existing governance framework. Although these initiatives facilitate community interaction with public services and planning tools, they may not fully embody the community-driven pathway's ethos of equitable decision-making and resource sharing. Responses offered by city officials often uphold conventional governance, missing the substantial, equity-driven change that Chambers et al. (2021) term "empowering voices."

There's a noticeable gap between the City's professed support for community-guided planning and actual policy shifts that would alter power structures. Present co-production and capacity-building endeavors are predominantly dialogical, without evolving into significant policy reforms ("reframing agency"). This stalls the potential for partnerships to recalibrate power and bolster community institutions. The City's hesitance to move away from deep-seated power dynamics and bureaucratic routines continues to hamper co-innovative and institutional advancements. This status quo challenges the need to critically reexamine Houston's approach to co-production. Adopting strategies that genuinely redistribute power and empower communities is paramount for achieving lasting urban resilience and aligning with the objectives of the community-driven pathway (Attygalle, 2020).

4.2. Proposed Strategies and Scales of Co-Produced Institutions

The NRP strategically intertwines capacity building with existing urban planning and policy frameworks. The NRP's approach, resonating with the insights of Huybrechts et al. (2017), positions grassroots micro-organizations as pivotal in shaping and influencing broader institutional and policy landscapes. Figure 3 in the study illustrates how proposed actions across different scales are linked to governing bodies, constructing a nuanced fabric of public service and management structures that enhance social capital and empower communities to negotiate power with larger institutions.

In the short term, the NRP prioritizes visible actions that directly impact social resilience. One example is a city-grant-funded electrical box mural project led by a local artist, advocated by the NST, and catalyzing cultural investment. Concurrently, the City's Department of Neighborhoods amplifies this effect by providing essential support for capacity-building initiatives aimed at emergency response. This synergy underscores the active engagement between NST and city agencies such as 311 and Public Works,

Table 1. Categorization of actions and strategies indicating shifts in power, resources, and agency, reflective of city commitment based on NST meeting discussions.

Normative lens (Bremer & Meisch, 2017)	Co-production modes (Chambers et al., 2021)	Discussed challenges and actions	Existing power and resource distributions	Process and discussion
Institutional	Brokering power, reframing power	Community inquiries focused on enhancing their understanding of municipal policies and accessing City resources Discussions emphasized fostering community participation in leadership roles and educating residents on effective advocacy and risk management NST meetings served as collaborative platforms, uniting diverse groups to focus on shared neighborhood goals and addressing conflicts stemming from competition over resources	In the absence of strong local leadership, the power and resources are all with the City and agencies	Workshops linked community members to essential tools and municipal resources, bolstering efforts in organization and outreach; the potential political power of solid community organizations was emphasized as some of these groups revised their relationships with the City and other organizations
		NST discussions underscored the necessity for collaborative partnerships across private, public, and regional entities to advance neighborhood projects and policies effectively, with the City's facilitation being a key component Capital improvement projects are driven by urgency and political will; community members will need to establish political partnerships to promote interests and access to funding A range of planning incentives exist, including tax revenue mechanisms, yet a gap in community awareness persists on how to leverage these tools for local benefit	Underutilized community leadership mechanisms and available resources, the power can be balanced	The City and team provided the resources to understand these mechanisms and committed to promoting capital improvement projects and planning initiatives on their end

Table 1. (Cont.) Categorization of actions and strategies indicating shifts in power, resources, and agency, reflective of city commitment based on NST meeting discussions.

Normative lens (Bremer & Meisch, 2017)	Co-production modes (Chambers et al., 2021)	Discussed challenges and actions	Existing power and resource distributions	Process and discussion
Public service	Reframing power, reframing agency	Concerns about inadequate police enforcement of ordinances, particularly regarding illegal trash disposal, were recurring in meetings Civic clubs initiated dialogue with the police department to boost local enforcement presence Community patrols sought expedited City responses and official support to enhance local safety measures Disputes within neighborhood patrols surfaced, highlighting a need for clearer City guidelines and support	The resources and decisions are with the governmental agency	Efforts were made to enhance dialogue between community patrols and police representatives; the initiative included developing educational materials for residents and providing conflict resolution and legal support to neighborhood patrols
		Community members reported challenges with the 311 call center's responsiveness to infrastructure issues, with requests often closed without resolution The maintenance of drainage ditches, reliant on 311, faced neglect, exacerbated due to jurisdictional discrepancies between local and regional authorities	The resources and decisions are with the governmental agency	The process facilitated dialogue between NST, the community, and 311 staff, with staff attending various meetings and open houses to clarify system operations and priority-setting for service responses
Empowerment	Empowering voices	NST members emphasized the vital role of local knowledge and historical context in shaping neighborhood resilience and heritage Strategies were discussed for preserving properties and practices and restoring historic urban patterns using existing planning mechanisms.	The power is with the agency but can be shared through political activism and organization	Power-sharing relies on available mechanisms that allocate local decision-making to neighborhood leadership; however, it is controlled by the City and City Council

promoting regular infrastructure maintenance and advocating against illegal dumping. Advocacy efforts, such as a campaign for better maintenance of drainage ditches, highlighted the community's capacity to initiate, change, and secure commitments from the City (McGuinness, 2023). In the medium term, the NRP tackles infrastructural resilience, with the NST facilitating dialogue to expedite stormwater system improvements in collaboration with the Harris County Flood Control District. The NST's partnership with Trees for Houston illustrates the impact of cooperative, cross-agency initiatives that contribute to environmental stewardship and community engagement. Long-term projects within the NRP involve substantial, transformative interventions that require a broad spectrum of stakeholder engagement. The NST's instrumental role in ensuring that community voices are heard and actively shaping these initiatives is captured in Figure 5 (City of Houston's Planning and Development Department, 2023).

Representatives and community members from three neighborhoods worked together to establish priorities and visions and to assign responsibilities for roles and projects to drive implementation strategies. However, the process required trust and commitment from the municipality to ensure the community perceived the project as feasible. Thus, the municipality and the community had to work together to champion implementable projects. Each community had a different starting point regarding the strength of local institutions, knowledge of city planning mechanisms, and links to city officials. The co-production process required the establishment of requisite community organizations, as depicted in Figure 6. This nascent process highlights a considerable path toward implementation and transformative adaptive capacity that seeks to recalibrate power through governance frameworks. Although preliminary, this perspective illuminates the early stages of creating transdisciplinary links and co-owned public service institutions. The comparison of the three shows the limits of the co-production process for each NST workshop. While these workshops focused on community priorities and engaging a wider political context in proposing strategies and linked institutions, they still fell short of achieving a power shift (Jagannathan et al., 2020).

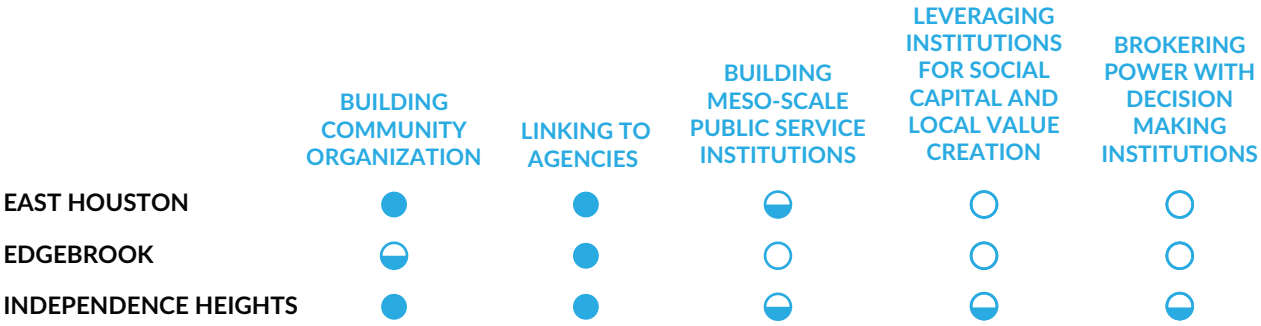


Figure 6. Institution-building progress resulting in the NRP co-production process. Note: A filled circle indicates an achieved goal and a half-full circle indicates a partially accomplished goal.

Addressing power imbalances and fostering inclusivity is crucial for co-production success in equitable climate adaptation (Bremer & Meisch, 2017; Chambers et al., 2021). However, an "implementation gap" persists at the municipal level (Wamsler, 2017), indicating a need for improved integration of transdisciplinary approaches into climate strategies. Enhanced by expert and policy support, ground-up institution-building can deepen participation and strengthen adaptive bases (Bixler et al., 2022; Huybrechts et al., 2017).

While current city initiatives establish a base for community involvement and empowerment, they mark only the beginning of a necessary shift toward democratic and resilient urban governance. Figure 7 encapsulates

this evolution, showcasing the roles of both nascent and established micro-institutions in spatial strategy development. It reveals the organizational entities, resource access shortfalls, and gaps in political engagement. At the outset, efforts concentrate on building trust and administrative efficacy. Subsequent phases create a cooperative policy framework that promotes adaptability and values at the local level. Looking ahead, strategies seek to utilize insights from micro-institutions within an overarching funding and planning model, aiming for community-centric change. However, many strategies remain reliant on existing public services, thus failing to substantially alter the landscape of authority and decision-making. To truly foster community resilience and reduce disparities, the City's administration and consulting teams must continually evaluate and refine their approach. Implementing sustainable resilience measures that transcend mere consultation and deliver tangible, community-aligned solutions is critical.

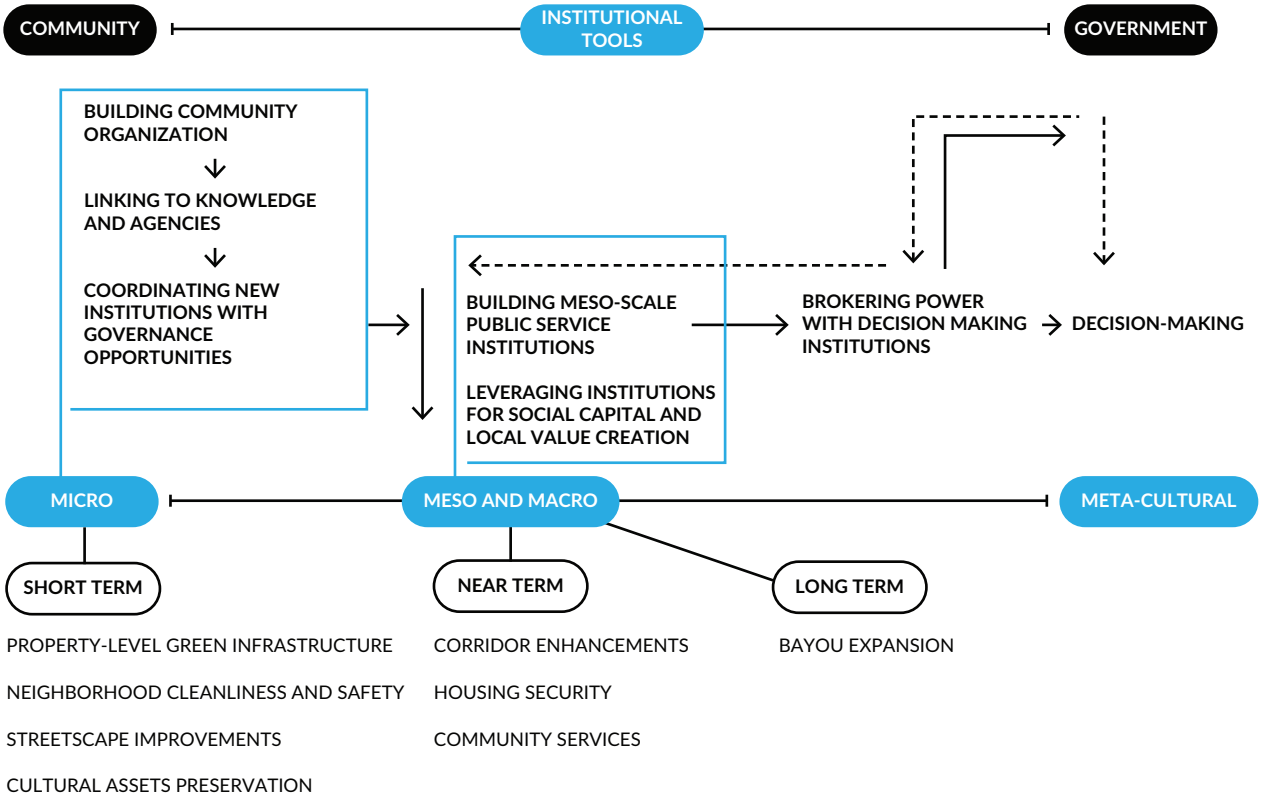


Figure 7. The institutions and the proposed actions as developed through the NRP process. As discussed in the NRP planning process and developed with NST members, actions are classified based on the institutional scale and how they connect to the analytical framework, as set out in Figure 3.

5. Discussion and Conclusion

Ostrom's (1996) work on collective governance provides a theoretical backdrop for examining the NRP process, underscoring the critical role of active community involvement in managing public services and shared resources. The NRP, anchored in the normative lenses of empowerment, public service, and institutional structures as delineated by Bremer et al. (2017), has fostered community institutions and adaptive spatial strategies across three distinct neighborhoods. This collaborative framework has laid the groundwork for actionable resilience strategies, emphasizing empowerment and resonating with Akerlof et al. (2023) regarding the importance of community expertise and rights in participatory co-production.

The comparative approach of this study has sharpened the understanding of co-production by outlining specific mechanisms, practices, and tools that contribute to community climate adaptation across these neighborhoods. It has contextualized the unique challenges and opportunities within each locality, offering a detailed perspective on how co-production can either support or impede the critical rebalancing of power dynamics necessary for effective climate adaptation measures. By contrasting the experiences of the three neighborhoods, the study highlights the transformative potential of co-production in achieving social integration and equitable climate action. This approach is supported by the necessity of robust organizational networks for initiating co-production and fostering equitable governance, as asserted by Chambers et al. (2021).

NST dialogues have emphasized the importance of providing local groups with strategic development resources, building collective action capacities, and fostering trust with local agencies. This approach aligns with Ostrom's philosophy of inclusive management and marks a shift from development-centric urban planning to community-driven resilience efforts. The efficacy of co-production is contingent upon these strong organizational networks, which have been effectively utilized in Houston to advance local adaptation projects and institutional building through the NRP.

The study also critically addresses Jagannathan et al.'s (2020) concern that co-production may perpetuate existing power imbalances. It advocates for a proactive approach that recognizes and reconfigures entrenched hierarchies within urban planning and governance to facilitate transformative adaptation actions (Lotfata & Munenzon, 2022; Ruiz-Mallén, 2020; Siders, 2019; Wamsler, 2017; Ziervogel et al., 2016).

Empirical evaluations of initiatives such as Houston's NRP prove indispensable for understanding the complex role of co-production in nurturing cohesive, empowered, and sustainable communities. The study advocates a paradigm shift towards a transformative co-production approach that empowers marginalized communities and reimagines the interaction between science, policy, and practice in climate change mitigation (Bixler et al., 2022). The comparative analysis conducted herein has elucidated the significance of effective governance in enabling communities to undertake equitable climate action. This research thus serves as an actionable guide for policymakers and practitioners dedicated to fostering resilient and equitable urban development.

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Conflict of Interests

The author was employed by One Architecture and Urbanism until June 2021 and from April 2022 to July 2022. No financial compensation or another reward from any organization or individual was received. During the NRP project timeline, the researcher was invited to observe the process.

References

Akerlof, K., Timm, K., Chase, A., Cloyd, E., Heath, E., McGhghy, B. A., Bamzai-Dodson, A., Bogard, G., Carter, S., Garron, J., Gavazzi, M., Kettle, N. P., Labriole, M., Littell, J. S., Madajewicz, M., Reyes, J., Rivers, L., Sheats, J. L., Simpson, C. F., & Toohey, R. (2023). What does equitable co-production entail? Three perspectives. *Community Science*, *2*(2), Article e2022CSJ000021. https://doi.org/10.1029/2022csj000021

Anguelovski, I., Shi, L., Chu, E., Gallagher, D., Goh, K., Lamb, Z., Reeve, K., & Teicher, H. (2016). Equity impacts of urban land use planning for climate adaptation: Critical perspectives from the Global North and South. *Journal of Planning Education and Research*, *36*(3), 333–348. https://doi.org/10.1177/0739456X16645166

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of Planners*, *35*(4), 216–224. https://doi.org/10.1080/01944366908977225

Attygalle, L. (2020). *Understanding community-led approaches to community change*. Tamarack Institute.

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544–559. https://doi.org/10.46743/2160-3715/2008.1573

Birch, E. L. (2012). Cities, people, and processes as planning case studies. In R. Crane & R. Weber (Eds.), *The Oxford handbook of urban planning* (1st ed., pp. 259–284). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195374995.013.0014

Bixler, R. P., Coudert, M., Richter, S. M., Jones, J. M., Llanes Pulido, C., Akhavan, N., Bartos, M., Passalacqua, P., & Niyogi, D. (2022). Reflexive co-production for urban resilience: Guiding framework and experiences from Austin, Texas. *Frontiers in Sustainable Cities*, *4*, Article 1015630. https://doi.org/10.3389/frsc.2022.1015630

Blackburn, J., & Bedient, P. B. (2018). *Houston a year after Harvey: Where we are and where we need to be*. James A. Baker III Institute for Public Policy of Rice University. https://8ed4fb93-0a65-4904-a19c-83610559d0e9.filesusr.com/ugd/d29356_e091a002a4044214a943df4d5d2100df.pdf

Bremer, S., & Meisch, S. (2017). Co-production in climate change research: Reviewing different perspectives. *WIREs Climate Change*, *8*(6), Article e482. https://doi.org/10.1002/wcc.482

Buckingham-Hatfield, S. (2000). *Gender and environment*. Routledge. Burns, D. (2014). Systemic action research: Changing system dynamics to support sustainable change. *Action Research*, *12*(1), 3–18. https://doi.org/10.1177/1476750313513910

Chambers, J. M., Wyborn, C., Ryan, M. E., Reid, R. S., Riechers, M., Serban, A., Bennett, N. J., Cvitanovic, C., Fernández-Giménez, M. E., Galvin, K. A., Goldstein, B. E., Klenk, N. L., Tengö, M., Brennan, R., Cockburn, J. J., Hill, R., Munera, C., Nel, J. L., Österblom, H., . . . Pickering, T. (2021). Six modes of co-production for sustainability. *Nature Sustainability*, *4*(11), 983–996. https://doi.org/10.1038/s41893-021-00755-x

City of Houston. (2020). *Resilient Houston*. https://www.houstontx.gov/mayor/Resilient-Houston-20200518-single-page.pdf

City of Houston's Planning and Development Department. (2023). *Neighborhood resilience planning*. Let's Talk Houston. https://www.letstalkhouston.org/nrp

City of Providence Office of Sustainability. (2019). *The City of Providence's Climate Justice Plan: Creating an equitable, low-carbon, and climate resilient future*. https://www.providenceri.gov/wp-content/uploads/2019/10/Climate-Justice-Plan-Report-FINAL-English-1.pdf

Crenshaw, K. (2013). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. In K. Maschke (Ed.), *Feminist legal theories* (pp. 23–51). Routledge.

Eidt, C. M., Pant, L. P., & Hickey, G. M. (2020). Platform, participation, and power: How dominant and minority

stakeholders shape agricultural innovation. *Sustainability*, *12*(2), Article 461. https://doi.org/10.3390/su12020461

Fisher, R. (1989). Urban policy in Houston, Texas. *Urban Studies*, *26*(1), 144–154.

Fitzgibbons, J., & Mitchell, C. L. (2019). Just urban futures? Exploring equity in "100 Resilient Cities." *World Development*, *122*, 648–659. https://doi.org/10.1016/j.worlddev.2019.06.021

Fox, S. (2000). The Houston townhouse. *Cite*, *49*, 19–23.

George, C. (2017, October 14). Houston-area libraries struggle to recover from Harvey. *Houston Chronicle*. https://www.houstonchronicle.com/news/houston-texas/houston/article/Houston-area-libraries-struggle-to-recover-from-12273984.php

Gonzalez, R. (2019). *The spectrum of community engagement to ownership*. Movement Strategy Center. https://movementstrategy.org/resources/the-spectrum-of-community-engagement-to-ownership

Gray, M. N. (2022). *Arbitrary lines: How zoning broke the American city and how to fix it*. Island Press.

Griego, A. L., Flores, A. B., Collins, T. W., & Grineski, S. E. (2020). Social vulnerability, disaster assistance, and recovery: A population-based study of Hurricane Harvey in Greater Houston, Texas. *International Journal of Disaster Risk Reduction*, *51*, Article 101766. https://doi.org/10.1016/j.ijdrr.2020.101766

Hardy, R. D., Milligan, R. A., & Heynen, N. (2017). Racial coastal formation: The environmental injustice of colorblind adaptation planning for sea-level rise. *Geoforum*, *87*, 62–72. https://doi.org/10.1016/j.geoforum.2017.10.005

Hendricks, M. D., Meyer, M. A., Gharaibeh, N. G., Van Zandt, S., Masterson, J., Cooper, J. T., Horney, J. A., & Berke, P. (2018). The development of a participatory assessment technique for infrastructure: Neighborhood-level monitoring towards sustainable infrastructure systems. *Sustainable Cities and Society*, *38*, 265–274. https://doi.org/10.1016/j.scs.2017.12.039

Hendricks, M. D., & Van Zandt, S. (2021). Unequal protection revisited: Planning for environmental justice, hazard vulnerability, and critical infrastructure in communities of color. *Environmental Justice*, *14*(2), 87–97. https://doi.org/10.1089/env.2020.0054

Hensel, M. U., & Nilsson, F. (2016). *The changing shape of practice: Integrating research and design in architecture*. Routledge.

Hoffman, J. S., Shandas, V., & Pendleton, N. (2020). The effects of historical housing policies on resident exposure to intra-urban heat: A study of 108 US urban areas. *Climate*, *8*(1), Article 12. https://doi.org/10.3390/cli8010012

Huybrechts, L., Benesch, H., & Geib, J. (2017). Institutioning: Participatory design, co-design and the public realm. *CoDesign*, *13*(3), 148–159. https://doi.org/10.1080/15710882.2017.1355006

Intergovernmental Panel on Climate Change. (2021). *Climate change 2021: The physical science basis. Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. https://doi.org/10.1017/9781009157896

Jacobs, F. (2019). Black feminism and radical planning: New directions for disaster planning research. *Planning Theory*, *18*(1), 24–39. https://doi.org/10.1177/1473095218763221

Jagannathan, K., Arnott, J. C., Wyborn, C., Klenk, N., Mach, K. J., Moss, R. H., & Sjostrom, K. D. (2020). Great expectations? Reconciling the aspiration, outcome, and possibility of co-production. *Current Opinion in Environmental Sustainability*, *42*, 22–29. https://doi.org/10.1016/j.cosust.2019.11.010

Jasanoff, S. (Ed.). (2004). *States of knowledge: The co-production of science and social order*. Routledge.

Joshi, A., & Moore, M. (2004). Institutionalised co-production: Unorthodox public service delivery in challenging environments. *Journal of Development Studies*, *40*(4), 31–49. https://doi.org/10.1080/00220380410001673184

Jurgilevich, A., Räsänen, A., Groundstroem, F., & Juhola, S. (2017). A systematic review of dynamics in climate risk and vulnerability assessments. *Environmental Research Letters*, *12*(1), Article 013002. https://doi.org/10.1088/1748-9326/aa5508

Kirkby, P., Williams, C., & Huq, S. (2018). Community-based adaptation (CBA): Adding conceptual clarity to the approach, and establishing its principles and challenges. *Climate and Development*, *10*(7), 577–589. https://doi.org/10.1080/17565529.2017.1372265

Klenk, N., Fiume, A., Meehan, K., & Gibbes, C. (2017). Local knowledge in climate adaptation research: Moving knowledge frameworks from extraction to co-production. *WIREs Climate Change*, *8*(5), Article e475. https://doi.org/10.1002/wcc.475

Korver-Glenn, E., Jain, M., Thompson, J., Steinberg, A., Herkes, D., & Kramer, T. (2017). Environmental equality in neighborhood amenities and planning: A Houston, Texas, case study. *Environmental Justice*, *10*(6), 193–200. https://doi.org/10.1089/env.2016.0046

Kousky, C. (Ed.). (2021). *A blueprint for coastal adaptation: Uniting design, economics, and policy*. Island Press.

Lodato, T., & DiSalvo, C. (2018). Institutional constraints: The forms and limits of participatory design in the public realm. In L. Huybrechts, M. Teli, A. Light, Y. Lee, J. Garde, J. Vines, E. Brandt, A. M. Kanstrup, & K. Bødker (Eds.), *Proceedings of the 15th Participatory Design Conference* (Vol. 1, Article 5). Association for Computing Machinery. https://doi.org/10.1145/3210586.3210595

Lotfata, A., & Munenzon, D. (2022). The interplay of intersectionality and vulnerability towards equitable resilience: Learning from climate adaptation practices. In R. Brears (Ed.), *The Palgrave encyclopedia of urban and regional futures*. https://doi.org/10.1007/978-3-030-51812-7_324-1

McGuinness, D. (2023, June 7). Houston will maintain the city's open ditches again, reversing a policy that put onus on residents. *Houston Chronicle*. https://www.houstonchronicle.com/politics/houston/article/houston-open-drainage-ditch-policy-reversed-18140084.php

Meerow, S., Newell, J. P., & Stults, M. (2016). Defining urban resilience: A review. *Landscape and Urban Planning*, *147*, 38–49. https://doi.org/10.1016/j.landurbplan.2015.11.011

Mees, H., Alexander, M., Gralepois, M., Matczak, P., & Mees, H. (2018). Typologies of citizen co-production in flood risk governance. *Environmental Science & Policy*, *89*, 330–339. https://doi.org/10.1016/j.envsci.2018.08.011

Mohtat, N., & Khirfan, L. (2021). The climate justice pillars vis-à-vis urban form adaptation to climate change: A review. *Urban Climate*, *39*, Article 100951. https://doi.org/10.1016/j.uclim.2021.100951

Muñoz-Erickson, T., Miller, C., & Miller, T. (2017). How cities think: Knowledge co-production for urban sustainability and resilience. *Forests*, *8*(6), Article 203.

Murray, S., & Poland, B. (2020). Neighbourhood climate resilience: Lessons from the Lighthouse Project. *Canadian Journal of Public Health*, *111*(6), 890–896. https://doi.org/10.17269/s41997-020-00432-0

Odongo, J. O., & Ma, D. (2021). Perspectives in urban planning research: Methods and tools. *Current Urban Studies*, *9*(4), 759–778. https://doi.org/10.4236/cus.2021.94045

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073–1087. https://doi.org/10.1016/0305-750X(96)00023-X

Oteros-Rozas, E., Martín-López, B., Daw, T. M., Bohensky, E. L., Butler, J. R. A., Hill, R., Martin-Ortega, J., Quinlan, A., Ravera, F., Ruiz-Mallén, I., Thyresson, M., Mistry, J., Palomo, I., Peterson, G. D., Plieninger, T., Waylen, K. A., Beach, D. M., Bohnet, I. C., Hamann, M., . . . Vilardy, S. P. (2015). Participatory scenario planning in place-based social-ecological research: Insights and experiences from 23 case studies. *Ecology and Society*, *20*(4), Article 32. https://doi.org/10.5751/es-07985-200432

Parnell, S., & Pieterse, E. (2016). Translational global praxis: Rethinking methods and modes of African urban

research. *International Journal of Urban and Regional Research*, *40*(1), 236–246. https://doi.org/10.1111/1468-2427.12278

Pelling, M., & High, C. (2005). Understanding adaptation: What can social capital offer assessments of adaptive capacity? *Global Environmental Change*, *15*(4), 308–319. https://doi.org/10.1016/j.gloenvcha.2005.02.001

Poland, B., Gloger, A., Morgan, G. T., Lach, N., Jackson, S. F., Urban, R., & Rolston, I. (2021). A connected community approach: Citizens and formal institutions working together to build community-centred resilience. *International Journal of Environmental Research and Public Health*, *18*(19), Article 10175. https://doi.org/10.3390/ijerph181910175

Pruitt, B. (2005). "For the advancement of the race": The great migrations to Houston, Texas, 1914–1941. *Journal of Urban History*, *31*(4), 435–478. https://doi.org/10.1177/0096144204274394

Qian, Z. (2010). Without zoning: Urban development and land use controls in Houston. *Cities*, *27*(1), 31–41. https://doi.org/10.1016/j.cities.2009.11.006

Qian, Z. (2011). Shaping urban form without zoning: Investigating three neighbourhoods in Houston. *Planning Practice & Research*, *26*(1), 21–42. https://doi.org/10.1080/02697459.2010.522857

Rackleff, N. (Ed.). (2015). *2015 analysis of impediments to fair housing choice*. City of Houston. https://houstontx.gov/housing/plans-reports/impediments/AI%20Final%208.18.2015%20reduced%20size.pdf

Ruiz-Mallén, I. (2020). Co-production and resilient cities to climate change. In J. Nared & D. Bole (Eds.), *Participatory research and planning in practice* (pp. 1–11). Springer. https://doi.org/10.1007/978-3-030-28014-7_1

Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature* (1st ed.). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199286294.001.0001

Schuetz, R. A., & Kanik, A. (2023, May 2). Most of Houston's open ditches are in minority neighborhoods, and poor maintenance puts them at risk. *Houston Chronical*. https://www.houstonchronicle.com/news/houston-texas/housing/article/open-ditch-drainage-equity-maintenance-flooding-17731420.php

Shokry, G., Anguelovski, I., & Connolly, J. J. T. (2023). (Mis-)belonging to the climate-resilient city: Making place in multi-risk communities of racialized urban America. *Journal of Urban Affairs*. Advance online publication. https://doi.org/10.1080/07352166.2022.2160339

Siders, A. R. (2019). Adaptive capacity to climate change: A synthesis of concepts, methods, and findings in a fragmented field. *WIREs Climate Change*, *10*(3), Article e573. https://doi.org/10.1002/wcc.573

Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy decisions reframed as justice and ethical concerns. *Nature Energy*, *1*(5), Article 16024. https://doi.org/10.1038/nenergy.2016.24

Swart, R., Timmermans, W., Boon, E., Van Ginkel, M., Goosen, H., Van Veldhoven, F., Cilliers, J., & Ndaguba, E. (2023). Can managing climate risks be a catalyst for broader transformative change? *Social Sciences*, *12*(3), Article 158. https://doi.org/10.3390/socsci12030158

Teli, M., Foth, M., Sciannamblo, M., Anastasiu, I., & Lyle, P. (2020). Tales of institutioning and commoning: Participatory design processes with a strategic and tactical perspective. In C. Del Gaudio, L. Parra-Agudelo, R. Clarke, J. Saad-Sulonen, A. Botero, F. C. Londoño, & P. Escandón (Eds.), *Proceedings of the 16th Participatory Design Conference 2020—Participation(s) Otherwise* (Vol. 1, pp. 159–171). Association for Computing Machinery. https://doi.org/10.1145/3385010.3385020

Turnhout, E., Metze, T., Wyborn, C., Klenk, N., & Louder, E. (2020). The politics of co-production: Participation, power, and transformation. *Current Opinion in Environmental Sustainability*, *42*, 15–21. https://doi.org/10.1016/j.cosust.2019.11.009

Van Kerkhoff, L. E., & Lebel, L. (2015). Coproductive capacities: Rethinking science-governance relations in a diverse world. *Ecology and Society*, *20*(1), Article 14. https://doi.org/10.5751/ES-07188-200114

Vojnovic, I. (2003). Governance in Houston: Growth theories and urban pressures. *Journal of Urban Affairs*, *25*(5), 589–624. https://doi.org/10.1111/j.1467-9906.2003.00004.x

Wamsler, C. (2017). Stakeholder involvement in strategic adaptation planning: Transdisciplinarity and co-production at stake? *Environmental Science & Policy*, *75*, 148–157. https://doi.org/10.1016/j.envsci.2017.03.016

Wolf, G., & Mahaffey, N. (2016). Designing difference: Co-production of spaces of potentiality. *Urban Planning*, *1*(1), 59–67. https://doi.org/10.17645/up.v1i1.540

Woodcraft, S., Osuteye, E., Ndezi, T., & Makoba, F. D. (2020). Pathways to the "good life": Co-producing prosperity research in informal settlements in Tanzania. *Urban Planning*, *5*(3), 288–302. https://doi.org/10.17645/up.v5i3.3177

Wyborn, C., Datta, A., Montana, J., Ryan, M., Leith, P., Chaffin, B., Miller, C., & Van Kerkhoff, L. (2019). Co-producing sustainability: Reordering the governance of science, policy, and practice. *Annual Review of Environment and Resources*, *44*(1), 319–346. https://doi.org/10.1146/annurev-environ-101718-033103

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). SAGE.

Ziervogel, G., Archer Van Garderen, E., & Price, P. (2016). Strengthening the knowledge–policy interface through co-production of a climate adaptation plan: Leveraging opportunities in Bergrivier Municipality, South Africa. *Environment and Urbanization*, *28*(2), 455–474. https://doi.org/10.1177/0956247816647340

Zuvanich, A. (2023, June 15). Independence Heights, a historic Black neighborhood in Houston, receives $100,000 grant to create conservancy. *Houston Public Media*. https://www.houstonpublicmedia.org/articles/news/houston/2023/06/15/454533/independence-heights-a-historic-black-neighborhood-in-houston-receives-100000-grant-to-create-conservancy

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Digital Platforms as (Dis)Enablers of Urban Co-Production: Evidence From Bengaluru, India

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Abstract

This article examines how digital platforms focused on citizen engagement affect urban transformation based on multiple case studies from Bengaluru, India. The research question is: What type of initiatives and designs of digital citizen platforms enable co-production? Co-production is defined as the use of assets and resources between the public sector and citizens to produce better outcomes and improve the efficiency of urban services. The study uses qualitative and quantitative approaches. Evaluative metrics of citizen engagement in digital platforms are done at two levels: platform metrics and initiative metrics. Each platform is evaluated under several variables that indicate the type of ownership, period of operation, aims and types of initiatives, and impact and levels of engagement. Then, the digital platforms are mapped for the extent of digital co-production that matches the type of digital interaction with a form of citizen–government relationship. The findings indicate that the orientation of digital co-production, where it exists, seems to be around the dimensions of co-testing and co-evaluation rather than co-design and co-financing. Furthermore, the digital platforms under study primarily view citizens as users rather than collaborators, limiting the scope of digital co-production. The involvement of urban local governments and private partners in a single platform strengthens the degree of citizen engagement, including the scope for co-production. Finally, there is a strong offline counterpart to citizen engagement through digital platforms where true co-production exists.

Keywords

Bengaluru; citizenship; co-production; digital platforms; India; urban transformation

1. Introduction

Strategies for increasing the interaction between governments and citizens have been attempted throughout history in diverse ways. In some contexts, federal structures and decentralization have been used to achieve this end, and in other situations, people have been tasked with planning and social auditing (Muusse, 2018). The use of digital platforms to decentralize power structures and expand tools of interaction has been an ongoing process since the proliferation of platforms as a mode of intermediation (Srnicek, 2017). The involvement of digital platforms has enabled a spectrum of participatory modes ranging from interaction to collaboration and co-production of ideas and services (Falco & Kleinhans, 2018). This article examines how digital platforms focused on citizen engagement affect urban transformation based on multiple case studies from Bengaluru, India. The study advances the understanding of the type of citizenship participation that these platforms engender and of the idea of smart cities, an increasingly popular policy in the Global South.

India's Smart Cities Mission, launched as a flagship project by the Ministry of Housing and Urban Affairs in June 2015, included Bengaluru as one of its sites. The urban policy focus on the city was significant given its selection as the technology capital of India in the late 1970s. The Smart Cities Mission was rolled out in India in a specific sequence. Over 100 cities competed in a national-level urban competition for proposal funding. They were aimed at adding a digital technological interface to their urban core through urban plans and vision documents, attracting investment and driving economic growth. In many ways, an encouragement of digital platforms for governance is an extension of this approach.

From the initial stages of conceptualization, the idea of smart cities in India as the solution for urban renewal met with reasonable skepticism on the grounds that it might reduce the space for participatory governance. The idea of business innovation, technological application, and efficient urban governance appeared to be a private and differentiated setup attractive to the middle class, though it left behind other diverse citizens who were making rights claims (Datta, 2015, 2018). Building digital platforms and improving technological infrastructure was portrayed as the prominent method for communities to participate in urban governance (Burte & Kamath, 2017).

The research question is: What type of initiatives and designs of digital citizen platforms enable co-production? The study uses qualitative and quantitative approaches. The empirical framework used by Muusse (2018) was adapted to design evaluative metrics of citizen engagement in digital platforms at two levels: platform metrics and initiative metrics. Each platform was evaluated under several variables that indicated the type of ownership, period of operation, aims and types of initiatives, and impact and levels of engagement. Then, the digital platforms were mapped for the extent of digital co-production using the theoretical framework of Linders (2012), which matched the type of digital interaction with a form of citizen–government relationship.

The article is divided into the following sections: Section 2 outlines the theoretical framework of co-production and the strategy, technology, organization, people, and environment (STOPE) framework used to analyze the cases. The methodology used in the study, including data collection and data analysis, is discussed in Section 3. Section 4 elaborates on the findings. Section 5 concludes the study while pointing out strands for future research.

2. Theoretical Framework

The idea of co-production has a long history in public management literature. The prominent early definition of co-production as the community's inevitable role in partnering with public service organizations to deliver meaningful goals was given by Ostrom (1972). Subsequently, this strand of literature has been expanded to include cases from the United States, Europe, and Australia (Osborne & Strokosch, 2013; Pestoff et al., 2012; Radnor et al., 2014; Verschuere et al., 2012) and evaluated in new contexts by Alford (2014). These studies espouse the idea of the participation of the public as much as the public's consumerism in using the services offered to them. In this manner, co-production is fused with the notions of intangibility and inseparability of the service offered.

Co-production is also a political issue involving practices of urban citizenship. An example of co-production in government services is participatory planning and budgeting as well as social auditing by which citizens are involved in the way a service is designed and delivered for public consumption. In the literature, co-production has been conceptualized as a bottom-up process with the potential for emancipation and civic change that encourages active citizenship (Burns, 2004). On the other hand, the advent of new companies and platforms demonstrates that co-production can also take the form of a top-down process of institutional change (Hanakata & Bignami, 2023). These contrary results suggest that co-production can expand or repress citizenship based on how it is institutionally set up.

Another strand of literature conceives co-production in terms of value propositions. In this conception, service is imagined as a process, rather than a tangible good, in which value is added at the moment of co-production (Edvardsson et al., 2011; Grönroos, 2008, 2011; Payne et al., 2008; Prahalad & Ramaswamy, 2004; Spohrer & Maglio, 2008; Vargo & Lusch, 2008). In this conceptualization, the interaction between the expectation and the realization of value leads to the co-production of services.

This study makes use of the definition of co-production from public service literature. Co-production can be broadly or narrowly defined. Co-production is narrowly defined as "the voluntary or involuntary involvement of public service users in any of the design, management, delivery and/or evaluation of public services" (Osborne et al., 2016, p. 640). However, this definition fails to take into account the intentional uses of co-production, including experimentation with novel technologies that governments engage in, which is relevant to the context of this study. Furthermore, this definition decontextualizes the use of co-production in a long line of political techniques for engagement that governments have adopted with various consequences.

Therefore, this study examines the literature on citizen engagement by the government through the broad classifications as both a one-way engagement and a two-way engagement (Falco & Kleinhans, 2018). While one-way engagement refers to the government sharing information with the citizens, the more interactive two-way engagement has expanded the scope of such activities to include collaboration in the design of policies and service delivery. Co-production in this context is defined as the "better use of assets and resources between the public sector and citizens to produce better outcomes and improve efficiency" (Falco & Kleinhans, 2018, p. 19).

This study engages with the broader definition of co-production in order to include not only citizen engagement in public service but also the use of various technologies that govern how this engagement is

made. For example, a simple interface with information could facilitate a passive form of citizen engagement through a minimum level of interaction while a more sophisticated interface that includes use, rating, and feedback could foster a more active form of engagement. Drawing out these differences and their political implications is possible only with the broad definition of co-production.

Digital technologies can evoke different impacts through co-production. First of these is the technology's ability to affect co-production indirectly. An instance of such an impact is digital technologies that coordinate co-production by enabling more efficient information flows and providing support functions. Examples include digital technologies that permit real-time data flow and monitoring such as electronic databases and digital signatures. The second type of impact is through those digital technologies that transform co-production by creating entirely new co-production practices or adding a digital layer on top of the traditional human-centered co-production. Examples of such transforming technologies range from assisted living technologies to living labs.

The third type of impact on co-production by digital technologies is the use of crowdsourcing methods that use gamification strategies, especially game-thinking, or in non-game contexts, incentivizing citizens to participate in and provide input for public service delivery or the ethos of the sharing economy (Mergel, 2016). In this vein, co-production can be seen in relation to the idea of governments as platforms (Linders, 2012). The advent of online platforms has been particularly conducive to improving the interaction between governments and citizens. Van Dijck and Poell (2016, p. 11) defined online platforms as "technological, economic and social-cultural infrastructure for facilitating and organizing online social and economic traffic between users and providers." Different platforms are often connected to each other as a network, resulting in an ecosystem for the organization of all kinds of connections between users and providers simultaneously. This feature influences the social and economic traffic of information and interaction. The main distinction that online platforms have in comparison with previous versions of digital technology such as the website is that they collect large amounts of data about their users both in the form of content data and user data and often use algorithms to process this data. This distinct feature of data generation and utilization allows for aggregating and disaggregating data in different forms and putting the data to further use in improving interactions from two-way to self-organization using algorithms (Muusse, 2018).

Building on the idea of platforms in combination with algorithms, the fourth type of impact can be conceived as the potential to substitute for traditional co-production practices. This means that digital technologies can alter the co-production process by fully or partly automating them and changing the role of co-producing citizens from active to passive participants. This ties with earlier studies such as Chandoke (1991) as well as more recent observations by Abraham and Rajadhyaksha (2015), who argue that the digitization of services produces new costs and barriers to accessing the entitlements of citizenship because access is accompanied by a new set of risks.

These four strands of digital co-production situate the digital platforms in the framework of platform urbanism, defined by Barns (2020) as how the particular dynamics of platform ecosystems entangle public and private organizations as well as citizens. Understanding digital platforms in this conceptual framework reveals different layers of governance structures and relationships that extend from traditional platforms to urban institutions.

Furthermore, the concept of co-production can be deconstructed to understand it as a stratified concept with different types of public involvement (Muusse, 2018). At the basic level is co-testing, in which an idea that has already been conceived is applied through a digital platform to evoke responses that citizens use to co-test the process for efficacy. The process is very similar to pilot programming an initiative. At the second level, digital platforms are used to co-evaluate the process with the help of citizens. At this level, the process or idea is tested by the users in comparison to other options, and a feedback loop is created to modify the process. A higher level of co-production is enabled through co-design, in which citizens participate in the design of the initiative in addition to testing and evaluating it. A further level of co-production incorporates co-financing along with co-design, transforming the ownership of the initiative more comprehensively to the users' end.

It is in this context of multiple trajectories of technology impact that this study examines the use of digital platforms and their impact on shaping co-production. The theoretical framework of different ways of interaction between technologies and citizens includes interaction, co-production, and self-organizing as different types of engagement. Based on these analyses, this study attempts to build a typology of interaction that digital platforms enable in this context.

3. Methodology

3.1. Data Collection

In India, 100 cities have been selected for rapid and comprehensive digitization as part of the smart city framework (Kylasam Iyer & Kuriakose, 2023). Bengaluru, in the southern state of Karnataka, is one of the foremost among them. In the postcolonial governance of Bengaluru, its designation as a technological city was established through setting up industrial parks where the municipal government provided a range of infrastructure services that enabled its growth. The role of a private and parallel system of governance through infrastructure includes both service delivery and a decongestion of services (Gopakumar, 2015; Idiculla, 2016). The establishment of digital platforms is a continuation of this process of construction and decongestion of the infrastructure of urban governance.

Having a natural ecosystem of technology start-ups and global multinational corporations, Bengaluru's experimentation with digital urban governance is politically significant. At the primary level, Bengaluru is being touted as an exemplar for not only other Indian cities but for the Global South in the discourse surrounding smart cities. At another level, the presence of numerous players enables the possibilities of diverse models of engagement through digital platforms in urban affairs. Furthermore, Bengaluru's historical attempts at decentralized governance as mandated by federal law have conflicted with the local government's priorities to compete and expand its potential as an investor-friendly destination. Comparing digital platforms' ability to co-produce is also a measurement of the city's ability to decentralize governance.

The first step of data collection was the creation of a long list of digital platforms dealing with urban affairs operating in Bengaluru. The list included platforms operating at a national level that also included a separate platform for Bengaluru as well as platforms specifically tailored for the city. The reason to include the former type of platform was mainly because digitization under the smart cities framework in India has been a multi-city project that incorporates citizenship initiatives as well.

Thematically, digital platforms that included both public and private players were included. The functionally diverse set of platforms ranged from providing urban services to creating awareness and lobbying for specific policy changes, making this a multi-sectoral study. Similarly, digital platforms that engaged in a wide set of tools and target groups were included. By adding these comparative frames, a typology was created during analysis.

In the second step of data collection, a shortlist was created from the longlist by keeping the five variables of the STOPE framework. If data was not available for the given period on all the five variables, then those cases were dropped. Table 1 lists the variables and their definitions. The STOPE framework operationalizes the concept of co-production to understand the level of co-producing involvement ranging from co-testing to co-evaluation, co-design, and co-financing. For each of the platforms (Next Bengaluru, Karnataka One, Reap Benefit, I Change my City, and Bengaluru Political Action Committee), the data on each individual indicator was manually tabulated from their publicly accessible websites since their conceptualization till December 2021. These findings are presented in Tables 3–5.

The five platforms under evaluation are comprehensively described using each of the five variables in the STOPE definition in the Supplementary File.

3.2. Data Analysis

The analysis of data proceeds in three steps. In the first step, each of the platforms was evaluated using a platform metric composed of 15 indicators as described in Table 2. These indicators decompose the five variables of the STOPE framework into measurable entities that can be compared. Based on the theoretical framework of co-production chosen for this study, in order to test the level of co-production, the comparable indicators chosen are ownership, engagement, and interaction.

In the second step, the descriptive statistics of these indicators, especially comparing ownership with types and number of initiatives and tools and level of engagement, are mapped to understand how the platforms differ qualitatively along these indicators. In particular, for the ownership indicator, how the type of interaction differs is examined through the mediating variable tools of engagement.

The objective of operationalizing the variables into indicators is to arrive at the underlying phenomenon that could bring out the relation between the indicators.

Table 1. Variable definitions using the STOPE framework.

Variable	Description
Strategy (S)	A statement on the vision and mission of the platform
Technology (T)	The type of communication infrastructure used
Organization (O)	The type of institutional setup
People (P)	The stakeholders including the managers of the platform, users, investors, the municipality, and other partners
Environment (E)	Knowledge, economy, and management of the platform

Source: Authors' work based on Muusse (2018).

Table 2. Platform metrics.

Indicator	Description
Name	Name of the digital platform
Type of ownership	Private organization Municipality Private organization with the participation of the municipality Collaborative project between private organization and municipality
Type of platform	Website, social media, physical space, and/or a combination
Presence of physical space/office	Yes/no If yes, what type of physical space (office, studio, open space)
Purpose of platform	Objective as given on the digital platform
Timeframe	Year(s) of operation
Location	Pan-city or neighborhood
Number of initiatives	Number of initiatives available currently as accessed on the website
Type of initiative	The sectors of involvement
Status of initiative	Completed, in process, or abandoned
Type of tools	Tools of interaction available on the website, including those for information, sharing, reaction, rating, and feedback
Level of interaction (scale of 1 to 5)	1. Overview/map 2. Sharing possibilities 3. Reaction possibilities 4. Voting/rating possibilities 5. Asking help/feedback
Involvement of government	Yes/no If yes, description (observer, partner, not involved)
Level of citizen–government relationship	Information sharing Interaction Self-organization Civic engagement (co-production)
Number of followers	Number of followers/subscribers on social media platforms
Number of reactions	Number of reactions on social media platforms

Source: Authors' work based on Muusse (2018).

4. Findings

After eliminating the rest of the digital platforms because they lacked one or more indicators on the STOPE framework, five cases were selected. In the remaining cases, the variables were operationalized using 15 indicators to create platform metrics for the digital platform cases. First, the indicator ownership type was compared with the levels of interaction through the tools of engagement. From Table 3, it is clear that there are three types of ownership of digital platforms: those that are entirely not-for-profit, those that are not-for-profit with government partners, and those that are government-owned with private partners. It is interesting to note that none of the cases are entirely owned by the government. For each of the ownership types, there are seven types of initiatives: housing, heritage, good governance, safety, sustainability, transport, and utilities. The maximum number and diversity of initiatives are found in not-for-profits with government partners.

Table 3. Number of initiatives.

Type of initiative	Number of not-for-profits involved	Number of not-for-profits with government partners involved	Number of government-owned platforms with private partners involved
Housing	1	0	0
Heritage	1	1	0
Safety	0	2	0
Good governance	0	2	0
Transport	1	2	0
Sustainability	1	2	1
Utilities	0	1	1

The next comparison was made between ownership type and the number of initiatives. Table 4 shows that platforms that are owned by governments with private partners have the maximum number of initiatives, and those that are exclusively not-for-profits have the least number of initiatives. This may be because governments tend to bring together various departments under a single platform catering to a number of utilities and services. On the other hand, not-for-profits tend to be cause-based. Furthermore, financial constraints might also explain why partnered digital platforms serve a higher number of initiatives than non-partnered ones.

Once the levels of engagement were established, we also delved into the technology aspect, which refers to the tools of engagement. Table 5 demonstrates that there are ten different tools of engagement used by these platforms, ranging from polls and newsletters serving subscribers to more sophisticated functions such as maps and prototypes. Furthermore, training on active citizen engagement through leadership programs and workshops is also provided on some platforms. Not-for-profits with government partners tend to use a wide variety of tools as compared to others. This can be explained by the fact that most private players who enter the field already have some capacity of technology that they put to broad use to understand the market for users based on their partnering government's interests. On the other hand, governments with private players as partners tend to use the least diverse tools of engagement. This can be explained by the fact that governments tend to be focused on utilities and service provision over other types of engagement. It is also interesting to observe, juxtaposing Table 5 with Table 3, that platforms with diverse tools of engagement are also more engaged in the co-production type of engagement.

The additional data from the platform metrics that is worth examining is the level of outreach that is indicated by the different types of social media following that each of the platforms has. Table 6 indicates

Table 4. Type of initiatives.

Type of platform	Less than 10 initiatives	10--100 initiatives	More than 100 initiatives
Government-owned		✓	
Not-for-profit with government partners	✓	✓	
Not-for-profits	✓		✓

Table 5. Tools of engagement.

Tool	Not-for-profits	Not-for-profits with government partners	Government partners
Poll	✓		
Newsletter	✓	✓	
Map	✓		
Dashboard	✓	✓	✓
Toolkit		✓	
App		✓	✓
Payment gateway		✓	✓
Research articles		✓	
Leadership programs/workshops	✓	✓	
Prototypes/models of products		✓	

the distribution of social media use and the platform's active following. Those that are left blank are cases where accurate figures could not be obtained with certainty. All data is self-reported by the platforms themselves. Facebook was the most popular social media used to interact with users and Twitter (now X) was catching up in numbers. This could be because Twitter is newer than Facebook and older users tend to use Facebook for social interaction more than Twitter. Comparatively, Instagram, the most recent and the most patronized by the younger generation, had less uptake.

Another lens to look at this data is through the type of information dissemination possible through these media. While Facebook and Twitter strongly combine photo and text messaging, Instagram is primarily visual. LinkedIn, which is a professional networking site, had the least uptake. Another point worthy of note is that three of the five co-producing platforms maintained an offline physical component to their activities. This could be to engender trust and continuity in delivering service face-to-face or because the nature of the service itself called for in-person interaction.

After comparing various indicators of interest from platform metrics that examined ownership with tools of interaction (technology of outreach), the fundamental mechanism of operation of digital platforms in terms of levels of engagement was mapped. As Table 7 demonstrates, two underlying concepts govern levels of engagement, namely ownership and tools used. The underlying concept of ownership ranges from the

Table 6. Platform and social media following.

	Platform 1	Platform 2	Platform 3	Platform 4	Platform 5
Facebook	1,887	212,893	18,252	4,881	5,123
Twitter		6,397	699	1,026	1,852
Instagram		20	1,205		2,251
YouTube		409	15,500		501
LinkedIn			656		1,815
Physical component	Yes	No	Yes	No	Yes

Table 7. Mapping typology.

Ownership (y-axis, vertical)/tools used (x-axis, horizontal)	Overview/map	Share	React	Vote/rate	Design/feedback
No involvement	Information	Interaction		Co-production	Self-organization
Partners: Implementation					
Partners: Data sharing					
Owners					

government being involved as owners or as partners in terms of implementation or data sharing to not being involved at all. The second underlying category, tools, ranged between five types: map, share, react, vote or rate, and design or feedback. For each ownership category, the tools of engagement were mapped. The reaction type was the most passive form of engagement, and feedback was the most active. From the combination of these underlying axes, four theoretical types of engagement (information, interaction, co-production, and self-organization) emerged. While the information type was the most passive form of citizen engagement, self-organization with the most active. Interaction and co-production were the categories with moderate types of engagement, with co-production involving more active citizens than interaction.

The term "co-production" is unpacked in Table 8. Depending on the ownership involvement and engagement levels scored on a scale of 1–5 with 5 showing the highest interaction based on tools and outreach of engagement, co-production is determined as intermediation or advocacy (denoted in blue). Engagement through merely voting and sharing involves co-testing as a form of co-production with minimal levels of engagement, which Platform 4 facilitates (denoted in white). In the highest category of engagement, two platforms that engage with citizens at the level of design and feedback perform functions of co-design and belong in the self-organization category (denoted in pink). The medium type of interaction is provided by other platforms. They provide space for voting or sharing, which is a form of co-evaluation. The type of ownership is as partners either in terms of data sharing or delivery of services. Based on these indicators, they can be co-producers aligning with advocacy functions or intermediation.

Table 8. Platform vs. type of relationship.

Platform	1	2	3	4	5
Engagement level	Designing/ feedback	Voting/rating	Voting/rating	Using/sharing	Designing/ feedback
Engagement score	5	4	4	2	5
Involvement of government	No	Partners for implementation	Partners for implementation	Owner	Partners for data sharing
Type of relationship	Self-organization	Co-production Intermediation	Co-production Advocacy	Interaction	Co-production Advocacy

5. Conclusion

This study compares five digital platforms based in Bengaluru, India, to understand the extent of co-production they enable in urban affairs. The indicators used to examine co-production are derived from the STOPE framework and comprise strategy, technology, organization, people, and environment. "Strategy" refers to the method of initiating citizen participation, while "technology" indicates the actual tools of participation. "Organization" describes the institutional form the digital platform takes to function, and "people" are the individuals who are situated within the organization. Finally, "environment" refers to the functional boundaries within which the organization operates.

The main conclusion of the study is that the orientation of digital co-production, where it exists, seems to be around the dimensions of co-testing and co-evaluation rather than co-design and co-financing. The four dimensions of co-production are an analytical tool to evaluate the degree of autonomy and participation available to the groups involved in co-production. Co-testing and co-evaluation imply the functional use of an existing design for efficacy and efficiency. On the other hand, co-design and co-financing imply an increased scope for ownership of the digital platforms for citizens. The presence of the first two types of features indicates that what comes out of these digital platforms is a patron–client type relationship between the government and the citizens.

The other observation from this research is that the majority of the digital platforms perceive citizens as users rather than collaborators in their activities and limit the scope of digital co-production. This means that services are provided by the digital platforms to be consumed by the citizens with a narrow feedback loop. The users do not participate much in generating these tools or designing them. This aspect mirrors the hierarchical mode of governance of urban affairs in the non-digital world and deviates from the ideals of people-led planning and participatory governance that Bengaluru adopted after India's liberalization in 1991. The explanation could be that while liberalization has enabled increased participation of the entrepreneurial class in urban affairs, the role of citizens has been limited to using the services of government, rather than creating them using decentralized governance principles.

The third feature to note from the study is that the involvement of urban local governments and private partners in a single platform strengthens the degree of citizen engagement including the scope for co-production. This inference stands in line with research that demonstrates that the presence of multiple types of stakeholders increases the accountability of the mechanism. For example, if a platform has public and private partners at different levels of ownership, the platform produces a wider range of engagement than the ones that are owned by just the government or are just not-for-profit-owned. However, the absence of social groups or intermediaries to citizens indicates that there is a lack of conceiving of the citizenry as investors in the process in the same way as the government and private players are perceived.

Finally, there is a strong offline counterpart to citizen engagement through digital platforms where true co-production exists. The offline components are in-person interactions such as meetings, leadership training, and workshops. The presence of offline activities that complement online digital platforms might indicate several things. The first point is that citizens may be inclined to trust urban local government activities in person more than online. Comfort with technology might be another factor that explains this. Additional factors such as time and resource constraints could also be of note. What is interesting is that exclusion from a true online co-production has led to the emergence of an offline component.

There are a few lines of exploration that can take this study forward. The question of what conditions enable co-design and ownership in co-production is preeminent among them. The demographics that are shifting to digital co-production are another feature worth examining. The impact of the Covid-19 pandemic on the adoption of a digital urban service model is another question that might have a lasting impact on the field.

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Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

References

Abraham, I., & Rajadhyaksha, A. (2015). State power and technological citizenship in India: From the postcolonial to the digital age. *East Asian Science, Technology and Society: An International Journal*, *9*(1), 65–85.

Alford, J. (2014). The multiple facets of co-production: Building on the work of Elinor Ostrom. *Public Management Review*, *16*(3), 299–316.

Barns, S. (2020). *Platform urbanisms: Negotiating platform ecosystems in connected cities*. Palgrave Macmillan.

Burns, S. (2004). *Exploring co-production: An overview of past, present and future*. New Economics Foundation.

Burte, H., & Kamath, L. (2017). The violence of worlding. *Economic and Political Weekly*, *52*(7), 66–74.

Chandoke, N. (1991). The post-colonial city. *Economic and Political Weekly*, *26*(50), 2868–2873.

Datta, A. (2015). A 100 smart cities, a 100 utopias. *Dialogues in Human Geography*, *5*(1), 49–53.

Datta, A. (2018). The digital turn in postcolonial urbanism: Smart citizenship in the making of India's 100 smart cities. *Transactions of the Institute of British Geographers*, *43*(3), 405–419.

Edvardsson, B., Tronvoll, B., & Gruber, T. (2011). Expanding understanding of service exchange and value co-creation: A social construction approach. *Journal of the Academy of Marketing Science*, *39*, 327–339.

Falco, E., & Kleinhans, R. (2018). Beyond information-sharing. A typology of government challenges and requirements for two-way social media communication with citizens. *Electronic Journal of e-Government*, *16*(1), 32–45.

Gopakumar, G. (2015). Who will decongest Bengaluru? Politics, infrastructures & scapes. *Mobilities*, *10*(2), 304–325.

Grönroos, C. (2008). Service logic revisited: Who creates value? And who co-creates? *European Business Review*, *20*(4), 298–314.

Grönroos, C. (2011). Value co-creation in service logic: A critical analysis. *Marketing Theory*, *11*(3), 279–301.

Hanakata, N. C., & Bignami, F. (2023). Platform urbanization, its recent acceleration, and implications on citizenship. The case of Singapore. *Citizenship Studies*, *27*(2), 189–209.

Idiculla, M. (2016). New regimes of private governance: The case of electronics city in peri-urban Bengaluru. *Economic and Political Weekly*, *51*(17), 102–109.

Kylasam Iyer, D., & Kuriakose, F. (2023). Becoming digital citizens: Covid-19 and urban citizenship regimes in India. *Citizenship Studies*, *27*(2), 230–246.

Linders, D. (2012). From e-government to we-government: Defining a typology for citizen coproduction in the age of social media. *Government Information Quarterly*, *29*(4), 446–454.

Mergel, I. (2016). Social media in the public sector. *Encyclopedia of Public Administration and Public Policy*, *3*, 3018–3021.

Muusse, L. (2018). *From idea to reality: A study on the stimulation of citizen initiatives for urban development by using online platforms* [Unpublished master's thesis]. TU Delft. http://resolver.tudelft.nl/uuid:e0f32051-0189-4c41-9dcd-7a3ffd4fe103

Osborne, S. P., Radnor, Z., & Strokosch, K. (2016). Co-production and the co-creation of value in public services: A suitable case for treatment? *Public Management Review*, *18*(5), 639–653.

Osborne, S. P., & Strokosch, K. (2013). It takes two to tango? Understanding the co-production of public services by integrating the services management and public administration perspectives. *British Journal of Management*, *24*, S31–S47.

Ostrom, E. (1972). Metropolitan reform: Propositions derived from two traditions. *Social Science Quarterly*, *53*(3), 474–493.

Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, *36*, 83–96.

Pestoff, V. A., Brandsen, T., & Verschuere, B. (Eds.). (2012). *New public governance, the third sector and co-production* (Vol. 7). Routledge.

Prahalad, C. K., & Ramaswamy, V. (2004). Co-creating unique value with customers. *Strategy & Leadership*, *32*(3), 4–9.

Radnor, Z., Osborne, S. P., Kinder, T., & Mutton, J. (2014). Operationalizing co-production in public services delivery: The contribution of service blueprinting. *Public Management Review*, *16*(3), 402–423.

Spohrer, J., & Maglio, P. P. (2008). The emergence of service science: Toward systematic service innovations to accelerate co-creation of value. *Production and Operations Management*, *17*(3), 238–246.

Srnicek, N. (2017). *Platform capitalism*. Wiley.

Van Dijck, J., & Poell, T. (2016). Understanding the promises and premises of online health platforms. *Big Data & Society*, *3*(1). https://doi.org/10.1177/2053951716654173

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*, *36*, 1–10.

Verschuere, B., Brandsen, T., & Pestoff, V. (2012). Co-production: The state of the art in research and the future agenda. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, *23*, 1083–1101.

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ARTICLE

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"The Citizen" as a Ghost Subject in Co-Producing Smart Sustainable Cities: An Intersectional Approach

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Abstract

The importance and benefits of engaging citizens as co-producers of urban transformation have been increasingly recognised. However, the mere implementation of citizen co-production does not guarantee more legitimate or inclusive policy decisions and outcomes, especially when power inequalities that shape local decision-making remain unaddressed. This article examines the transformative potential of citizen co-production in smart sustainable city initiatives using two successive citizen panels in Trondheim, Norway, as cases. The study aimed to understand the role of citizen co-production in these panels, and the notion of "the citizen" within their frameworks. Three challenges with co-production were identified. Firstly, the ad-hoc nature of citizen engagement emphasised individual participation rather than facilitating collective spaces from which political agency could emerge. Secondly, citizens' viewpoints were perceived as uninformed preferences that could be transformed through professional guidance. This, coupled with the closed nature of the initiatives, raises questions about the transformative potential of the processes, particularly in challenging the underlying premises of citizen co-production shaped by a neoliberal discourse of smart sustainable cities. The article concludes with a call to analyse citizen co-production spaces through an intersectional lens that attends to relational understandings of power dynamics and identities. This analysis should not only consider who participates, but also how "the citizen" as a subject is conceptualised and mobilised, how citizens' interests and knowledge are taken into account, and the political significance of their involvement.

Keywords

citizen panel; co-production; democratic innovations; intersectionality; smart sustainable cities

1. Introduction

Recently, co-production has become more prevalent in urban planning and development, especially in conjunction with discussions in sustainability science with a particular focus on co-producing urban sustainability (Caniglia et al., 2021; Chambers et al., 2021; Frantzeskaki & Rok, 2018; Richardson et al., 2018). While many scholars highlight the role of academia and researchers in such co-production, this article focuses on the central role of citizens and how "the citizen" subject is co-produced. We discuss citizen co-production by drawing on a study of two citizen panels carried out by the Trondheim Municipality in Norway as part of their efforts to co-produce smart and sustainable city strategies. We define co-production as a process that encompasses, but is not limited to, knowledge production, where situated understandings of sustainability emerge and are acted upon through interactions among multiple actors. The term "citizen co-production" is employed to underscore the role of citizens, and to distinguish our work from practice-oriented research where researchers are centrally positioned.

Our objective in studying citizen co-production is to generate a critical understanding of the possibilities for transformative change through its practice. Transformative change in this context means a shift in power relations that enable individuals and groups to effectively impact state institutions and policy development (Mitlin & Bartlett, 2018). It entails questioning dominant agendas for sustainable development, taking into account marginalised voices and making space for contestation and pluralism (Chambers et al., 2022). Hence, achieving transformative change requires serious engagement with the power asymmetries inherent in co-production processes and scrutiny of whose interests are being advanced. Nevertheless, Turnhout et al. (2020) have expressed concern that insufficient attention has been paid to the role of power and politics in the co-production literature. In response to this concern, we propose intersectionality as an analytical approach to unpack co-production. Originating from the praxis of critical race theory and feminism, intersectionality provides a critical framework for understanding, explaining, and intervening against the reproduction of inequality (Cho et al., 2013). Over the past 30 years, intersectionality has become a paradigm guiding not only gender, diversity and inclusion research but a variety of disciplines. An important premise lies in the dynamic conceptualisation of identity and social grouping, where individual and collective identities are entangled, and local categories or demarcation of actors are understood as constantly in the making (Collins & Bilge, 2020). Therefore, as the article will elaborate, unpacking citizen co-production with an intersectional lens demonstrates how the citizen subject is shaped and enacted dynamically throughout the co-production process, bearing in mind that some aspects of their identities are brought to the forefront while others are relegated to the background (V. M. May, 2015). Moreover, intersectionality draws attention to how co-production processes frequently neglect how identities, opinions, and political agency are formed collectively over time (Swyngedouw, 2010). Against this background, this article explores how intersectionality can contribute to situating and making visible power asymmetries in spaces of citizen co-production. It uses an intersectional lens to address the primary research question: How was "the citizen" subject conceptualised, enacted, and co-produced in the design of the citizen panels alongside considerations made about inclusion and exclusion during their implementation?

The two citizen co-production practices discussed in this article were chosen because of their explicit aim to create an inclusive and deliberative space for sustainable urban planning and development. The first initiative, the citizen panel named Borgerkraft, involved 16 residents who came together to deliberate on the criteria for Trondheim Municipality to support citizen-initiated sustainability interventions in their own

neighbourhoods. Borgerkraft is an invented word which combines the Norwegian words *borger* (citizen) and *kraft* (power), translated into English as "citizen power." The second initiative, the Trondheim Panel, involved 50 residents who deliberated on societal dilemmas and sustainability challenges in Trondheim. The Trondheim Panel was implemented as part of developing the societal element of the municipal master plan for 2020–2032. One of the reasons for Trondheim Municipality's experimentation with these specific forms of co-production—categorised as democratic innovations—was in response to limited citizen outreach through organisations, and to avoid the overrepresentation of certain social groups in participatory spaces. Thus, both initiatives are approached as deliberative efforts by the Trondheim Municipality towards inclusiveness and a wider representation of citizens in processes of co-producing strategies for sustainable urban planning and development.

While taking note of the criticism and concerns regarding research on specific interventions or pre-given models of participation (Chilvers & Longhurst, 2016; Mitlin & Bartlett, 2018), we argue that paying close attention to specific spaces of co-production helps to generate a critical understanding of how power relations and inequalities are produced, maintained, or challenged in co-production. This approach brings us closer to the empirically grounded intersectionality approach articulated by Marfelt (2016). Furthermore, the citizen panels in our study were sequential, with the Trondheim Panel designed to incorporate insights from the Borgerkraft process. Adopting a connected case study methodology allows us to analyse the differences in implementation between the two panels, enabling a process-oriented comparison (Bartlett & Vavrus, 2017).

The article begins by introducing intersectionality as an entry point to assess the transformative potential of citizen co-production practices. It then explains the methods employed to study the two citizen panels and provides the background for the Trondheim Municipality's efforts to co-produce smart and sustainable city strategies and plans. The article continues to outline the design and set-up of the two citizen panels and analyses their implementation concerning three concepts: *equality of presence*, *equality of voice*, and *outcomes*. We show how citizen co-production does not necessarily lead to more inclusive and effective policy decisions and outcomes unless power inequalities that shape local decision-making are challenged. We argue that an intersectional perspective is crucial in making such dynamics visible and should be further developed as an approach to studying citizen co-production.

2. Unpacking Citizen Co-Production With an Intersectional Lens

This article examines the co-production of sustainability strategies, policies, and plans through citizen panels. Some suggest that the term "co-creation" better describes these upstream processes (Brandsen et al., 2018). However, since the panels' purposes, designs, and roles were primarily developed by the municipality, we view the panels as mid-stream between initiation, active decision-making, and consultation. Moreover, the article focuses on how "the citizen" is constructed and co-produced as an ideal and depoliticised subject in these processes. The term "co-production" has been conceptualised and used in different ways across public and business administration, science and technology studies, and sustainability science (Miller & Wyborn, 2020). While there is no agreed-upon definition, sustainability science conceptualises co-production as an aspirational approach imperative for tackling complex problems like sustainability challenges. Conversely, within public and business administration as well as science and technology studies, co-production is deemed inevitable, regardless of whether the relationships among actors are collaborative, confrontational, or competitive. They all contend that complex challenges cannot be solved by the public sector alone and

that knowledge production or governance is always embedded in larger societal processes. They also question whose knowledge and worldviews are taken into account in deliberate processes of co-production (Miller & Wyborn, 2020; Turnhout et al., 2020). This question is essential, since the lack of attention to power asymmetries and the political dimensions of co-production risks reproducing or exacerbating existing inequalities (Cardullo & Kitchin, 2019; Levenda, 2019; Turnhout et al., 2020). For instance, experiments with citizen co-production through citizen panels have faced criticism for prioritising consensus while overlooking the influence of power within participatory spaces, leading to foreclosed political imaginaries and sustained status quo (Swyngedouw, 2010). As a result, the transformative potential of citizen co-production has been called into question, emphasising the need to unpack how it takes place, who it involves, and what political significance it has. Intersectional perspectives can prove useful in this regard, as they highlight the role and impact of power structures on discrimination and privilege.

While intersectionality is often narrowly understood as a concept bringing attention to the intersections of identities such as gender, class, race, and ethnicity, intersectional perspectives also offer ways to foreground critical inquiry (Collins, 2019). An intersectional way of thinking, as articulated by Cho et al. (2013) and Collins (2019), emphasises the never-static, mutually constitutive processes of identity and agency formation to understand social differences and power, and attend to the multi-dimensional dynamics of inclusion and exclusion. It acknowledges distinctive "standpoints" shaped by mutually influencing systems of power that form the understanding of knowledge and ways of knowing about and acting upon the social and material world. Intersectional perspectives are thus helpful to assess to what extent co-production initiatives can be regarded as transformative. For instance, Castán Broto and Neves Alves (2018) explore the crossovers between intersectionality and co-production of urban services. They contend that an intersectional lens may help to ask old and new questions about the recognition of needs, the dynamics of participation and deliberation, and the conceptual basis for understanding people's realities. They argue that this is important because, while co-production can facilitate the sharing of diverse experiences, it can also limit and close arenas for dialogue. Although the emphasis of Castán Broto and Neves Alves lies on community-based organisations, grassroots groups, and co-production practices in lower-income countries, they implicitly demonstrate how the use of intersectionality as a critical lens can help unpack power relations of co-production in "invited spaces" (Cornwall, 2008) such as the citizen panels discussed in this article.

Citizen panels framed as democratic innovations are typically designed to address inequalities and deliberate on processes of social change. The enthusiasm for co-production in urban planning and the proliferation of democratic innovations converge on the goal of creating new modes of citizen engagement that are more inclusive and give voice to marginalised groups (Nyseth et al., 2019). In the research presented in this article, we use an analytical framework that encompasses the concepts of equality of presence, equality of voice, and outcome. This framework is inspired by the literature on deliberative governance and democracy, viewed through an intersectional lens. According to Smith (2009), the selection method employed in citizen panels is intended to ensure equality of presence and prevent systematic exclusion of certain social groups from participation. Secondly, the deliberation in small groups with structured facilitation aims at promoting equality of voice. However, these claims of equality are ideals and require constant critical scrutiny (Curato & Böker, 2016). Moreover, equality of presence and equality of voice are not necessarily transformational if they do not lead to concrete outcomes (Nyseth et al., 2019). Here, intersectionality plays a vital role. Wojciechowska (2019), for instance, argues that intersectional analyses can advance the inclusivity of democratic innovations with a particular eye on people who are at the intersection of disempowered

identity markers, and on people who identify themselves as part of a dynamic identity spectrum outside of traditional category-based understandings. While we agree that this is an important perspective, our study does not primarily focus on specific identity groups. Instead, we employ an intersectional lens to understand how the citizen-subject is conceptualised and performed alongside considerations made about inclusion and exclusion during the design and implementation of the two citizen panels.

2.1. Equality of Presence

To ensure equality of presence, citizen panels place central importance on how citizens are recruited into the process. Random sampling techniques, for example, guarantee that "each member of the (political) community" has an equal chance to be selected just as they attempt to give voice to "people that are often neglected" (Michels & Binnema, 2019, p. 236). A citizen panel informed by an intersectional approach may try to critically engage with social divisions and categorical boundaries that are used to shape equality of presence in citizen panels. Attention may be given to how categories are constructed in specific situations and concerning specific people (Yuval-Davis, 2006). To avoid the exclusion of citizens from numerically small social groups, citizen panels may employ stratified sampling or quotas to ensure their inclusion (Smith, 2009). However, even if it helps expand coverage, the use of predefined categories for inclusion may result in the oversight of marginalised groups at the intersection of multiple categories. Additionally, individuals who are unregistered or homeless can be excluded from the sampling base (Wojciechowska, 2019). Such exclusion is indicative of the power held by the designer of panels to define the political community and what should count as "the citizen" in each group. At the same time, the majority of those who are invited onto citizen panels refuse to participate due to how they perceive their roles, abilities, and capabilities in political participation and the prospect of influencing the outcome of participation (Jacquet, 2017). Therefore, as Wojciechowska (2019) observes, critical reflection is needed concerning structural factors which may prevent some from participating while privileging others.

2.2. Equality of Voice

Equality of presence does not directly translate into equality of voice, which entails providing every participant with an equal opportunity to influence the deliberation process and final outcomes (Smith, 2009). To create an environment where diverse viewpoints are not only respected but also given substantial consideration, the design of citizen panels takes into account how the agenda or the mandate of the panel is set, how information and knowledge are made available to panel members, how facilitation is conducted, and how decision-making is documented. Citizen panels centre decision-making on deliberation, where the citizen power lies in the ability to present compelling ideas and arguments to shape the outcome (Michels & Binnema, 2019). Here, the assumption is that individuals will be open to considering and integrating ideas and perspectives presented by others because they are not engaged as stakeholders or representatives of organised groups. With this assumption, factors like "social practices, institutional arrangements, and cultural ideologies and the outcomes of these interactions in terms of power" may be overlooked (Davis, 2008, p. 68). On the other hand, recognising power relations and their role in subject formation keeps the focus on complex subjectivities that cannot be understood in isolation from social locations and cautions against the de-politicised treatment of inequalities as mere individual differences (V. M. May, 2015). Further, these factors that are brought to light with an intersectional lens problematise the very idea of the "common good" that often guides deliberation.

2.3. Outcomes

One of the underlying premises of representative deliberative processes is that they can lead to better public decisions (OECD, 2020). However, in many instances, the outputs of citizen panels come in the form of recommendations rather than binding decisions directed at the organising body (Smith & Wales, 2000). Panels often lack clear connections to formal planning processes, which can undermine transparency and accountability and hinder the materialisation of outcomes (Nyseth et al., 2019). Besides the exceptional cases where the recommendations of citizen panels led to public referendums on electoral reforms, there is no guarantee that citizen panels' recommendations influence broader political decision-making processes (Smith, 2009). This reflects, to some extent, the tension between direct and indirect democracy, where democratic innovations are meant to complement and not substitute other representative local democracy structures (Niessen, 2019). It can also be difficult to trace what impact citizen panels have on decision-making and assess the outcomes against the purpose of the panels. In fact, ensuring publicity and accountability is seen as one of the weaker traits of citizen panels (Smith, 2009). This relates to publicity concerns (Young, 2001), how decision-making and outcomes in such panels are rarely documented (Setälä, 2017), and the depoliticised nature of the deliberation process where consensus on "the public good" is highlighted over conflicting stakeholder interests (Niessen, 2019).

3. Methods

The study was conducted using a connected case study approach (Bartlett & Vavrus, 2017). The two cases were selected due to their explicit focus on democratic values and inclusiveness, which stood out from previous citizen co-production practices in Trondheim at the time of the study. The panels were organised in succession, with the insights from the Borgerkraft Panel intended to inform the design of the Trondheim Panel. This sequencing allowed for a process-oriented comparison between the two. Fieldwork was carried out by the lead author between 2020 and 2023, resulting in 18 qualitative interviews with municipal planners, resource persons involved in setting up and implementing the panels, and panel members. It is important to note that none of the authors were engaged in the design or implementation of the panels. While the initial plan was to mainly interview panel members, this proved challenging since the Borgerkraft Panel was executed with strict anonymity measures. The only opportunity to contact the panel members was a one-time invitation sent via a panel organiser, to which just one member responded. Conversely, the names of the members of the Trondheim Panel were made public and three members were interviewed. In addition to the interviews, we draw on information from the official Trondheim Municipality website and a digital platform that they established for democratic innovations. The analysis is also informed by project documents of other citizen co-production initiatives in Trondheim and the political strategy Trondheim: The Co-produced Municipality that frequently surfaced in interviews.

The interviews with the panel organisers and resource persons explored the origin of the idea and motivation for organising citizen panels, how the panels were designed, and what role each of them had played in the design and implementation of the panels. Specific attention was paid to how the citizen was constructed as a subject and how interviewees reflected on issues regarding representation, process inclusion/exclusion and outcomes. The interviews with the panel members focused on their motivation for participating, their aspirations with the panel, and how they experienced their participation with similar reflections on representation, positionality, process, and outcomes. The interview data was transcribed and

coded using NVivo. Descriptive codes were initially assigned to phrases that described how the panels were carried out. Subsequently, analytical codes were developed and organised under the four headings of *framing* (co-production, construct of citizens, smart, sustainability), *recruitment* (inclusion, inequality, motivation), *deliberation* (agenda, facilitation, knowledge, representation), and *outcome* (governance, legitimacy, publicity, recommendation, trust). The data, organised under these headings, were subsequently analysed in terms of their association with the dimensions of equality of presence, equality of voice, and outcomes.

The aim of this article is not to evaluate the design and implementation of the two panels but rather to utilise examples from the two cases to demonstrate how an intersectional lens illuminates some of the challenges and dilemmas in using citizen panels to achieve transformative citizen co-production in urban planning. Although interviewing more panel members would have given deeper insights into the perspectives of the citizens themselves, examining the organiser's views through an intersectional lens proved useful in revealing the power asymmetries that influenced whose voices were heard and acted upon in the citizen panels. The four interviews with panel members also demonstrated the multiple and dynamic formation of individual and group identities and how they related to the making of the citizen subject in the panels.

4. Experiments With Citizen Co-Production Through Citizen Panels in Trondheim

Since the 2000s, citizen panels have regained popularity in Norway with a growing emphasis on citizen co-production, which redefines the roles of local authorities and citizens (Nyseth et al., 2019). In Trondheim, The Co-Produced Municipality strategy is implemented in the municipal planning strategy, highlighting the responsibility that the municipality has as a democratic institution to engage citizens as co-producers in planning (Trondheim Municipality, 2019). The strategy views citizens as active rather than passive recipients of services, leveraging them as valuable resources to address complex societal challenges. In Trondheim, citizen co-production has specifically been utilised in smart sustainable city development and to localise the Sustainable Development Goals (Gohari et al., 2020; Refstie, 2022). The two panels discussed in this article are examples of such efforts, reflecting how citizen panels have been tested in several Norwegian cities in recent years to address sustainability (Arnesen et al., 2021). However, the Borgerkraft and Trondheim Panels can be distinguished from previous citizen panels in Norway in that they employ random sampling to assemble a panel of citizens to engage in deliberation processes on public matters. They thus represent novel experiments of citizen co-production.

4.1. The Borgerkraft Panel

The Borgerkraft Panel was designed and implemented as part of a project by the municipal planning administration in collaboration with researchers from the Norwegian University of Science and Technology and with the support of the social enterprise SoCentral. The aim was to accelerate local sustainability efforts through collaborations between the planning administration and citizens. It had a geographical focus on the southern districts of Trondheim, a diverse part of the city characterised by a relatively high prevalence of social problems. The planning administration had previously experimented with various participatory initiatives in an area-development programme targeting one of these districts, and the planners who worked with the area programme were mobilised for the design and implementation of the panel. The Borgerkraft project was initially designed as a stepwise process where the citizen panel (Phase 1) would design a

participatory budgeting process (Phase 2) as illustrated in Figure 1. However, Phase 2 did not take place due to a change of circumstances in terms of budget availability, but also because anticorruption regulation blocks direct public decision-making on the spending of state budgets and grants (Whittington, 2022). Therefore, the mandate of the panel was changed to, firstly, deliberate on what sustainability means locally to citizens in Southern Trondheim; secondly, give ideas on how to mobilise local resources to contribute towards sustainable development; and thirdly, advise the municipality on how they could better support local initiatives.

<table>
<tr><td rowspan="3">Borgerkraft project</td><td colspan="4">Phase 1</td><td colspan="3">Phase 2</td></tr>
<tr><td colspan="4">Borgerkraft Panel</td><td colspan="3">Participatory budgeting</td></tr>
<tr><td colspan="3">Recruitment</td><td>Deliberation</td><td>Recommendations</td><td>Proposals by citizens</td><td>Voting</td><td>Implementation</td></tr>
<tr><td rowspan="4">Municipal master plan</td><td>Phase 1</td><td colspan="4">Phase 2</td><td colspan="2">Phase 3</td><td>Phase 4</td></tr>
<tr><td colspan="6">Development of the plan by the planning administration</td><td rowspan="3">Endorsement by Municipal Council and implementation</td></tr>
<tr><td rowspan="2">Gathering of citizens' perspectives</td><td colspan="4">Trondheim Panel</td><td rowspan="2" colspan="2">Goal and strategy setting workshops and public hearings</td></tr>
<tr><td>Recruitment</td><td>Deliberation</td><td>Recommendations</td></tr>
</table>

Figure 1. Citizen panels (in green) shown as one segment of the Borgerkraft project and the development of the municipal master plan.

Of the project areas, 800 residents were chosen through a lottery process and 82 citizens responded positively to participation. Using the self-reported information about their gender, age, and districts, the pool of respondents was further stratified to roughly represent the demography in the areas, resulting in 16 panel members whose identities were kept anonymous to the public. The Borgerkraft Panel met four times between February and June 2020. The process of deliberation followed what is commonly recommended in citizen panels: a learning phase, followed by deliberation and decision-making (OECD, 2020). The panel discussed what sustainability meant for them in the areas where they live, what types of projects the planning administration and citizens could collaborate on, and the criteria for citizen initiatives to receive support from the municipality. While the full report has not yet been published, the panel recommended the municipality to fund (a) projects that contribute to better, more sustainable, and diverse neighbourhoods; (b) projects that are identity-building and create a sense of belonging; and (c) projects that contribute to social inclusion (Næss, 2020).

4.2. The Trondheim Panel

The Trondheim Panel was initiated in 2021 to increase citizen involvement in developing the societal element of the municipal master plan 2020–2032. The panel followed a range of co-production activities put in place by the planning administration (Figure 1). Four thousand invitations were sent to randomly selected residents, of which 375 were accepted; 50 members were then selected for the panel based on gender, age, district of residence, and level of education, roughly representing the demography of Trondheim in those categories. The panel was asked to deliberate on two overarching questions: (a) How does a "good life" in Trondheim's community fit into the discussion about the planet's resilience and the environmental and climate debate? (b) What smart steps must we take going forward? The panel was summoned on five occasions between

November 2021 and February 2022. It followed the process of getting to know each other, learning about the topic, deliberation, and making recommendations for the plan. At the last gathering, the panel presented their recommendations to the members of the municipal council. The Trondheim-based design firm Spring Methods was involved in the design and implementation of the panel, and the process was observed and evaluated by SINTEF, a research organisation (see Floch et al., 2023). After the Trondheim Panel, the proposal of the master plan went through another round of citizen deliberation including a public hearing (Phase 3) before the plan was adopted by the municipal council in November 2022 (Phase 4).

5. Presence, Voice, and Outcome in the Borgerkraft and Trondheim Panels

Although the two citizen panels had many similarities in their goals, underlying assumptions, and design, there are key differences that impacted equality of presence, equality of voice, and outcomes. In the following sections, we discuss these variations and their implications.

5.1. Equality of Presence

One of the main reasons for using the random sampling technique to recruit panel members in both cases was to attain a certain level of representativity and overcome unequal participation by including groups that are normally underrepresented. This was partly achieved in both panels. One member described the Borgerkraft Panel as "a group of people who I would normally, maybe never even, have a conversation with—people with very different lives, different ages, at different stages in life, with different political views." Members of the Trondheim Panel shared this impression of diverse representation. Still, the selection criteria failed to include a careful consideration of politically marginalised groups. For instance, the municipality had previously identified women from multicultural backgrounds as a missing and underrepresented group in participatory planning and decision-making. However, no intentional inclusion was made of this group. To mitigate the exclusion of temporal residents, both panels were set up using the postal register instead of the National Register. This was primarily to include students who often remain registered in their home districts while studying in Trondheim but also to include non-citizen residents of Norway (Arnesen et al., 2022). As already pointed out, equality of presence does not necessarily lead to equality of voice. In addition to the power dynamics present in participatory spaces, it cannot be assumed that people recruited for their specific backgrounds necessarily represent the standpoints of those specific social groups during deliberation (Lang, 2007). This is contingent on how representation is understood and communicated in the set-up of panels, but also on whose voices citizens bring to the table of deliberation. One commonly held assumption about citizen panels is that citizens mobilised as individuals are more likely to be open to others' perspectives and think more about the collective good (Escobar, 2017). This assumption was also visible in the Borgerkraft and Trondheim Panels. The organisers assumed that citizens joined the panels as individuals, and they were only expected to come with their personal experiences and insights. Despite this, several of the panel members interviewed perceived their role as representatives for their local neighbourhoods, or as advocates of others who shared a similar standpoint. There was thus a discrepancy between how the organisers and panel members viewed their roles in terms of representation and voice.

5.2. Equality of Voice

Deliberation in citizen panels often starts with a learning phase, wherein members acquire knowledge provided by experts such as academic researchers, public officials, activists, and stakeholders on the topics at hand (Escobar, 2017). This learning phase is designed to facilitate the transformation of the "raw preferences" of panel members consisting of "narrow private interests and pre-existing knowledge and prejudices" into a well-informed and reflective understanding of the issues (Smith, 2009, p. 24). Identifying what information is important and who should provide that information largely depends on the organisers' perspectives. Their bias may thus influence the problem framing and possible solutions in ways that filter out the potential that citizen knowledge holds. On the other hand, when participants are not endowed with expert knowledge, it could result in developing unrealistic proposals or ideas that are already being implemented (Michels & Binnema, 2019). For the Borgerkraft Panel, a contracted social enterprise prepared an information package with presentations made by researchers and municipal planners. The organisers deemed these actors' knowledge vital to ensure relevance for the municipal work and for panel members to reassess their position on an issue. The Trondheim Panel similarly began with municipal planners presenting on sustainable development, detailing Trondheim's performance in specific areas. In addition, inputs collected through other methods of citizen engagement were thematised by the planners and shared with panel members in the form of keywords and inspirational questions. In both panels, the agenda was set by the organisers. They believed that sustainability, being a value-driven issue, was well-suited for deliberation by a citizen panel. Nevertheless, both the organisers and panel members acknowledged that the topic's wide scope was a challenge. In an interview, one of the Borgerkraft Panel members questioned the panel's role, pointing out that they perceived the nature of the topics discussed as practical rather than value-based. Panel members also found it challenging to make direct links between expert knowledge and their own perspectives.

Active and balanced facilitation in participatory spaces is considered essential to bring together expert and citizen knowledge, but also to prevent certain voices from dominating the discussion and encourage the inclusion of marginalised voices (Smith, 2009). The organisers of both panels recognised the importance of adept facilitation in creating a welcoming environment and a safe and open space. Similarly, some of the panel members interviewed appreciated the facilitators' role in fostering inclusivity. However, some panel members felt that the facilitators held more influence than the members. Panel members also expressed the importance of building relationships among panel members to secure a safe and open space to both develop and voice concerns. As the groups in which they worked constantly changed, this was perceived as difficult.

5.3. Outcome

The Borgerkraft project was launched as a democratic innovation experiment with few benchmarks to evaluate its success. Moreover, the lack of documentation of the panel process in terms of minutes and reports, and how the names of the panel members were kept anonymous makes it difficult to assess its outcomes. Positioned as a first-time experiment, the Borgerkraft project had limited resources for implementation and lacked a formal mechanism for taking its recommendations forward when the second phase of participatory budgeting was cancelled. In contrast, the Trondheim Panel was integrated within a formal planning process. The panel's recommendations were not only presented to the politicians and incorporated into the official plan but also made public via a digital platform. Despite these efforts, panel

members expressed uncertainty regarding the outcomes of the initiative and their level of interest in following up on the process varied. The recommendations were just one of many considered by the planners when drafting the plan. Moreover, the actual impact of the plan itself depends on how the recommendations are translated into concrete projects and measures in the future, for example, when the societal element of the master plan is developed into a legally binding land-use plan. Ensuring that the panel members' voices influence outcomes then requires their ongoing political engagement and the means and resources to do so. Studies on similar initiatives have shown that the advisory nature of citizen panels makes it easy for their outputs to be disregarded if they compete with inputs from political parties, experts, and interest groups (Smith, 2009). The difficulty in tracking decisions and outcomes of the panels makes it easy for decision-makers to selectively choose recommendations that align with their political interests (Harris, 2019). The assertion of the absence of elite conflicts and special interests in citizen panels does therefore not hold true in terms of their outcomes (Michels & Binnema, 2019).

Co-production initiatives like citizen panels may provide a range of outcomes, which should not solely be assessed by tangible plans and results. Learning can be a significant outcome, observed among both municipal staff and panel members in both panels. Furthermore, citizen panels can foster a sense of empowerment among members. However, for such participation to be considered transformative, this empowerment must translate into new ways of working together and real influence over the city's development strategies and resource allocation (Hickey & Mohan, 2004). Moreover, serious consideration must be made to how co-production can enable the sharing of diverse experiences, but also restrict arenas for dialogue and exclude the very groups that require the most democratic attention (Castán Broto & Neves Alves, 2018; Wojciechowska, 2019). This exclusion may take place in different ways in terms of presence, voice, or outcomes and is closely related to how "the citizen" is constructed as a subject in co-production initiatives such as citizen panels.

6. "The Citizen" as a Ghost Subject in Co-Production

Co-production is expected to develop new knowledge and new ways of integrating knowledge into decision-making, leading to new outcomes in the world (Miller & Wyborn, 2020). In Trondheim, the municipality pursued citizen panels as one tool to safeguard citizens' values and interests in strategies and plans and to mobilise resources for the city's sustainable development. The use of citizen panels was perceived to encompass diversity and provide better solutions to sustainability challenges. The panel members interviewed in both cases recognised the value of having discussions among a group of people with diverse backgrounds, and how that led to new ideas and solutions. They also assessed their experience as positive, indicating their willingness to participate in similar initiatives in the future if given the opportunity. However, an intersectional analysis brings to light concerns regarding how citizens were conceptualised and mobilised in the panels in ad hoc ways as isolated individuals guided by professionals. Intersectional perspectives emphasise that individual and collective identities are inseparable and that it is in their intertwined dynamic that political agency is created (Collins, 2019). Lang (2007) stresses the significance of a collective deliberation process for citizens to recognise their individual experiences as part of a larger whole, and to be able to advocate on behalf of social group interests. Therefore, she concludes "the assumption that a randomly selected group will be representative of the views of the general public can't be sustained just by looking at the demographics of the group" (Lang, 2007, p. 55). Her argument resonates with how the theory and praxis of intersectionality concentrate on analysing processes of specific

positionings and identities that "are constructed and interrelate and affect each other in particular locations and contexts" rather than conceptualising identities as something fixed and static (Yuval-Davis, 2006, p. 200).

The expectations held by the panel organisers about the citizens participating were contradictory. On one hand, they aimed to establish a panel free of group interests while, on the other hand, individuals were selected based on certain categories to form a representative group. Even though they met on several occasions, the panels were not designed to build personal relationships and create a sense of safety and trust. The panel members were treated as "atomic" individuals (Mitchell, 2005), the emphasis was on learning from "experts" on sustainability and the sessions were led by professional facilitators to have the panels serve the specific purposes set by the municipality. As illustrated in another study on smart sustainable city projects in Trondheim (Gohari et al., 2020), citizens were envisioned as learners who provided solutions or feedback that conform to the social and political norms set by the project. This means that even if equality of presence and equality of voice is perceived to be achieved in co-production initiatives such as citizen panels, the conceptualisation of "the citizen" in such processes can foreclose urban imaginaries as it does not allow for a collective political agency that challenges the premises of smart sustainable city work to form (Cardullo & Kitchin, 2019; T. May & Perry, 2017). "The citizen" is envisioned as someone who simultaneously embodies the traits of social groups but lacks decisive political agency. While they contribute valuable local insights, they are perceived to require guidance to shape "correct" viewpoints. Consequently, "the citizen" emerges as what Bjørkdahl (2020) terms a "ghost subject"—embodying the inherent contradictions and complexities of co-production. This conceptualisation of "the citizen" in co-production bears resemblance to the notion of "imagined lay persons" (Maranta et al., 2003), "imagined publics" (Sharp et al., 2015), and "imagined citizens" (Feichtinger & Pregernig, 2005), all of which highlight how citizens become functional constructs in policy processes. However, the depiction of the citizen as a "ghost subject" underscores that the ideal citizen, as imagined in many co-production processes, simply *does not and cannot exist*. Acknowledging the citizen in this ghostly role might help illuminate why co-production often falls short of its transformative potential, creating a disparity between its stated outcomes and the actual results, as observed by Jagannathan et al. (2020). An intersectional approach to understanding co-production initiatives such as citizen panels is useful in this regard, as it brings attention not only to interpersonal differences which relate to gender, ethnicity, class, and other social relations in specific contexts but also emphasises how subjects are constructed in response to structures of power present in participatory spaces. Research that builds on intersectionality to analyse participatory spaces can therefore contribute to providing much-needed critical insights by questioning not only "who participates" but also scrutinising what co-production is, what it is for, and its transformative potential. This is relevant considering the democratic aspirations of, and the significant resources spent on, co-production processes.

7. Conclusion

By analysing the efforts of a local government in Norway to co-produce smart and sustainable city strategies and plans, through citizen panels, this article reinforces the claims made by preceding research on the importance of addressing power asymmetries and political dimensions of co-production (Butzlaff, 2020; Chambers et al., 2021; Turnhout et al., 2020). The literature on co-production is burgeoning. However, most of these works adopt an aspirational and methodological stance, emphasising the significance of co-production for environmental governance and knowledge creation. They detail the "why" and "how" of

co-production but frequently overlook the reasons why such processes often fall short of their intended empowerment and societal transformation goals. An important question regarding citizen co-production is whether citizens can challenge fundamental premises that shape strategies and initiatives through their participation (T. May & Perry, 2017). This article highlights that adopting an intersectional approach to co-production can shed light on inherent discordances in initiatives that impact their democratic ideals and transformative potential. This pertains in particular to the framing of citizen panels as a means to engage underrepresented groups in decision-making processes, and how panel members are asked to deliberate on politically contested topics such as sustainability in a depoliticised manner. An intersectional approach, with its attention to relational understandings of power and identities, can advance studies on co-production by making visible the ghostly aspects of how citizen participation is imagined, to materialise and bridge the gap between the transformative aspirations and realities.

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The authors declare no conflict of interests.

References

Arnesen, S., Bentsen, H. L., Bjørseth, P., Fimreite, A. L., Ohren, A., Skiple, J. K., & Aars, J. (2022). *Hvordan gjennomføre borgerpanel* (Report No. 38). NORCE.

Arnesen, S., Fimreite, A. L., & Aars, J. (2021). Loddet er kastet: Om bruken av innbyggerpaneler i lokalpolitikken. In J. Saglie, S. B. Segaard, & D. A. Christensen (Eds.), *Lokalvalget 2019: Nye kommuner—Nye valg?* (pp. 253–283). Cappelen Damm Akademisk.

Bartlett, L., & Vavrus, F. (2017). Comparative case studies. *Educação & Realidade*, *42*(3), 899–920. https://doi.org/10.1590/2175-623668636

Bjørkdahl, K. (2020, November 9). Vi, mennesker. *Prosa*. https://prosa.no/artikler/essay/vi-mennesker

Brandsen, T., Steen, T., & Verschuere, B. (Eds.). (2018). *Co-production and co-creation: Engaging citizens in public services*. Routledge.

Butzlaff, F. (2020). Between empowerment and abuse: Citizen participation beyond the post-democratic turn. *Democratization*, *27*(3), 477–493. https://doi.org/10.1080/13510347.2019.1707809

Caniglia, G., Luederitz, C., von Wirth, T., Fazey, I., Martín-López, B., Hondrila, K., König, A., von Wehrden, H., Schäpke, N. A., Laubichler, M. D., & Lang, D. J. (2021). A pluralistic and integrated approach to action-oriented knowledge for sustainability. *Nature Sustainability*, *4*(2), 93–100. https://doi.org/10.1038/s41893-020-00616-z

Cardullo, P., & Kitchin, R. (2019). Being a "citizen" in the smart city: Up and down the scaffold of smart citizen participation in Dublin, Ireland. *GeoJournal*, *84*(1), 1–13. https://doi.org/10.1007/s10708-018-9845-8

Castán Broto, V., & Neves Alves, S. (2018). Intersectionality challenges for the co-production of urban services: Notes for a theoretical and methodological agenda. *Environment & Urbanization*, *30*(2), 367–386.

Chambers, J. M., Wyborn, C., Klenk, N. L., Ryan, M., Serban, A., Bennett, N. J., Brennan, R., Charli-Joseph, L., Fernández-Giménez, M. E., Galvin, K. A., Goldstein, B. E., Haller, T., Hill, R., Munera, C., Nel, J. L., Österblom, H., Reid, R. S., Riechers, M., Spierenburg, M., . . . Rondeau, R. (2022). Co-productive agility and four collaborative pathways to sustainability transformations. *Global Environmental Change*, *72*, Article 102422. https://doi.org/10.1016/j.gloenvcha.2021.102422

Chambers, J. M., Wyborn, C., Ryan, M. E., Reid, R. S., Riechers, M., Serban, A., Bennett, N. J., Cvitanovic, C., Fernández-Giménez, M. E., Galvin, K. A., Goldstein, B. E., Klenk, N. L., Tengö, M., Brennan, R., Cockburn, J. J., Hill, R., Munera, C., Nel, J. L., Österblom, H., . . . Pickering, T. (2021). Six modes of co-production for sustainability. *Nature Sustainability*, *4*(11), 983–996. https://doi.org/10.1038/s41893-021-00755-x

Chilvers, J., & Longhurst, N. (2016). Participation in transition(s): Reconceiving public engagements in energy transitions as co-produced, emergent and diverse. *Journal of Environmental Policy & Planning*, *18*(5), 585–607. https://doi.org/10.1080/1523908X.2015.1110483

Cho, S., Crenshaw, K. W., & McCall, L. (2013). Toward a field of intersectionality studies: Theory, applications, and praxis. *Signs: Journal of Women in Culture and Society*, *38*(4), 785–810.

Collins, P. H. (2019). *Intersectionality as critical social theory*. Duke University Press.

Collins, P. H., & Bilge, S. (2020). *Intersectionality* (2nd ed.). Polity Press.

Cornwall, A. (2008). Unpacking "participation": Models, meanings and practices. *Community Development Journal*, *43*(3), 269–283. https://doi.org/10.1093/cdj/bsn010

Curato, N., & Böker, M. (2016). Linking mini-publics to the deliberative system: A research agenda. *Policy Sciences*, *49*(2), 173–190.

Davis, K. (2008). Intersectionality as buzzword: A sociology of science perspective on what makes a feminist theory successful. *Feminist Theory*, *9*(1), 67–85. https://doi.org/10.1177/1464700108086364

Escobar, O. (2017). Pluralism and democratic participation: What kind of citizen are citizens invited to be? *Contemporary Pragmatism*, *14*(4), 416–438.

Feichtinger, J., & Pregernig, M. (2005). Imagined citizens and participation: Local Agenda 21 in two communities in Sweden and Austria. *Local Environment*, *10*(3), 229–242. https://doi.org/10.1080/13549830500075503

Floch, J., Holen, S. M., & Branlat, M. (2023). *Citizens' assembly—Case study in Trondheim, Norway*. COLDIGIT.

Frantzeskaki, N., & Rok, A. (2018). Co-producing urban sustainability transitions knowledge with community, policy and science. *Environmental Innovation and Societal Transitions*, *29*, 47–51. https://doi.org/https://doi.org/10.1016/j.eist.2018.08.001

Gohari, S., Baer, D., Nielsen, B. F., Gilcher, E., & Situmorang, W. Z. (2020). Prevailing approaches and practices of citizen participation in smart city projects: Lessons from Trondheim, Norway. *Infrastructures*, *5*(4), Article 36. https://doi.org/10.3390/infrastructures5040036

Harris, C. (2019). Deliberative mini-publics: Defining and designing. In S. Elstub & O. Escobar (Eds.), *The handbook of democratic innovation and governance* (pp. 45–59). Edward Elgar Publishing.

Hickey, S., & Mohan, G. (2004). *Participation: From tyranny to transformation? Exploring new approaches to participation in development*. Zed Books.

Jacquet, V. (2017). Explaining non-participation in deliberative mini-publics. *European Journal of Political Research*, *56*(3), 640–659.

Jagannathan, K., Arnott, J. C., Wyborn, C., Klenk, N., Mach, K. J., Moss, R. H., & Sjostrom, K. D. (2020). Great expectations? Reconciling the aspiration, outcome, and possibility of co-production. *Current Opinion in Environmental Sustainability*, *42*, 22–29. https://doi.org/https://doi.org/10.1016/j.cosust.2019.11.010

Lang, A. (2007). But is it for real? The British Columbia Citizens' Assembly as a model of state-sponsored citizen empowerment. *Politics & Society*, *35*(1), 35–70.

Levenda, A. M. (2019). Thinking critically about smart city experimentation: Entrepreneurialism and responsibilization in urban living labs. *Local Environment*, *24*(7), 565–579. https://doi.org/10.1080/13549839.2019.1598957

Maranta, A., Guggenheim, M., Gisler, P., & Pohl, C. (2003). The reality of experts and the imagined lay person. *Acta Sociologica*, *46*(2), 150-165. https://doi.org/10.1177/0001699303046002005

Marfelt, M. M. (2016). Grounded intersectionality: Key tensions, a methodological framework, and implications for diversity research. *Equality, Diversity and Inclusion*, *35*(1), 31–47. https://doi.org/10.1108/EDI-05-2014-0034

May, T., & Perry, B. (2017). Knowledge for just urban sustainability. *Local Environment*, *22*(Suppl. 1), 23–35. https://doi.org/10.1080/13549839.2016.1233527

May, V. M. (2015). *Pursuing intersectionality, unsettling dominant imaginaries* (1st ed.). Routledge.

Michels, A., & Binnema, H. (2019). Assessing the impact of deliberative democratic initiatives at the local level: A framework for analysis. *Administration & Society*, *51*(5), 749–769.

Miller, C. A., & Wyborn, C. (2020). Co-production in global sustainability: Histories and theories. *Environmental Science & Policy*, *113*, 88–95. https://doi.org/https://doi.org/10.1016/j.envsci.2018.01.016

Mitchell, D. (2005). The S.U.V. model of citizenship: Floating bubbles, buffer zones, and the rise of the "purely atomic" individual. *Political Geography*, *24*(1), 77–100. https://doi.org/10.1016/j.polgeo.2004.06.003

Mitlin, D., & Bartlett, S. (2018). Editorial: Co-production—Key ideas. *Environment and Urbanization*, *30*(2), 355–366. https://doi.org/10.1177/0956247818791931

Næss, K. S. (2020, June 23). Trondheim tester borgerpanel. *Trondheim 2030*. https://trondheim2030.no/2020/06/23/trondheim-tester-borgerpanel

Niessen, C. (2019). When citizen deliberation enters real politics: How politicians and stakeholders envision the place of a deliberative mini-public in political decision-making. *Policy Sciences*, *52*(3), 481–503. https://doi.org/10.1007/s11077-018-09346-8

Nyseth, T., Ringholm, T., & Agger, A. (2019). Innovative forms of citizen participation at the fringe of the formal planning system. *Urban Planning*, *4*(1), 7–18. https://doi.org/10.17645/up.v4i1.1680

OECD. (2020). *Innovative citizen participation and new democratic institutions: Catching the deliberative wave*. https://doi.org/10.1787/339306da-en

Refstie, H. (2022). Reconfiguring research relevance—Steps towards salvaging the radical potential of the co-productive turn in searching for sustainable solutions. *Fennia—International Journal of Geography*, *199*(2), 159–173. https://doi.org/10.11143/fennia.114596

Richardson, L., Durose, C., & Perry, B. (2018). Coproducing urban governance. *Politics and Governance*, *6*(1), 145–149. https://doi.org/10.17645/pag.v6i1.1485

Setälä, M. (2017). Connecting deliberative mini-publics to representative decision making. *European Journal of Political Research*, *56*(4), 846–863. https://doi.org/https://doi.org/10.1111/1475-6765.12207

Sharp, L., Macrorie, R., & Turner, A. (2015). Resource efficiency and the imagined public: Insights from cultural theory. *Global Environmental Change*, *34*, 196–206. https://doi.org/10.1016/j.gloenvcha.2015.07.001

Smith, G. (2009). *Democratic innovations: Designing institutions for citizen participation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511609848

Smith, G., & Wales, C. (2000). Citizens' juries and deliberative democracy. *Political Studies*, *48*(1), 51–65.

Swyngedouw, E. (2010). Impossible sustainability and the post-political condition. In M. Cerreta, G. Concilio, & V. Monno (Eds.), *Making strategies in spatial planning* (pp. 185–205). Springer. https://doi.org/10.1007/978-90-481-3106-8_11

Trondheim Municipality. (2019). *Den samskapte kommunen Trondheim* (Case No. 18/16776). https://sites.google.com/trondheim.kommune.no/samskaping/start

Turnhout, E., Metze, T., Wyborn, C., Klenk, N., & Louder, E. (2020). The politics of co-production: Participation, power, and transformation. *Current Opinion in Environmental Sustainability*, *42*, 15–21. https://doi.org/https://doi.org/10.1016/j.cosust.2019.11.009

Whittington, O. (2022). *Democratic innovation and digital participation*. Nesta. https://www.nesta.org.uk/report/democratic-innovation-and-digital-participation-report

Wojciechowska, M. (2019). Towards intersectional democratic innovations. *Political Studies*, *67*(4), 895–911.

Young, I. M. (2001). Activist challenges to deliberative democracy. *Political Theory*, *29*(5), 670–690.

Yuval-Davis, N. (2006). Intersectionality and feminist politics. *European Journal of Women's Studies*, *13*(3), 193–209.

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ARTICLE

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Focusing on Actors, Scaling-Up, and Networks to Understand Co-Production Practices: Reporting From Berlin and Santiago

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Abstract

In different policy agendas, such as the New Urban Agenda and the Sustainable Development Goals, co-production is introduced as a desirable urban planning practice to validate the engagement and inclusion of diverse actors/networks. Nevertheless, some scholars argue (e.g., Watson, Robinson) that the Western planning approach faces difficulties incorporating rationalities beyond the Global North–South division. In this context based on the research project DFG-KOPRO Int for the German Research Foundation on Chilean and German cases and the local context, this article seeks to explore how local groups are undertaking co-production, which means of legitimacy are used, and which socio-spatial results develop. In doing so, the research focuses firstly on the negotiation processes (governance) between stakeholders by undertaking network analysis and, secondly, on understanding the impulse for urban development by analysing the project's socio-spatial material patterns. Chile's neoliberal context and the case studies showcase diverse cooperative forms that try to close governance gaps within strong political struggles. In the German context, actors from different areas, such as cultural institutions, universities, and private actors undertake diverse mandates for testing regulatory, persuasive, or financial instruments. As different as local realities are, the overall results show that co-production occurs mostly in highly contested fields such as housing projects and highlights a three-part constellation of actors—state, private, and civil society—in urban development. However, negotiation processes take place, ranging from conflictive to cooperative. Hence, co-production challenges prevailing social and political structures by providing an arena for new forms of collective and pluralistic governance.

Keywords

Delphi study; governance framework; international urbanism; neoliberal urban development; planning instruments; urban co-production

1. Introduction

Co-production was defined by Ostrom (1996) as a conceptual framework, a process in which resource management, its production, and reproduction emerge through the contribution of actors coming from different organisations. Accordingly, Ostrom's definition implies that diverse actors (e.g., citizens) can take an active role in the provision of goods and services that concern them. On the other hand, co-production is conceived as a right to the production of space. Here, the spatial resource is central and refers to the "right to the city" concept which, according to Lefebvre (2003), is based on social interactions in the production of space. Hence, co-production frameworks are processes that bring together different actors and rationalities, create socio-political awareness, and thus strengthen the capacity of communities to act. In this sense, its implicit transformative character, in which different actors come together, opens up the possibility of making urban processes more equitable in both its planning and management frameworks (Alfaro d'Alençon & López Morales, 2018). Despite the enthusiasm in debates, other voices have been critical, especially regarding its framing and adaptation outside the Global North. Scholars such as Watson (2014) and Robinson (2022) have argued that Western-rooted planning practices are neither representative nor necessarily adequate to a Global South context in which diverse rationalities and common practices take place based on complex societal struggles.

As part of the neoliberal turn, the withdrawal of the state and the entry of large-scale private actors in the field of urban development have fostered a clear shift towards a more complex network of actors. In this way, co-production also seems to represent a field of conflict and negotiation in which governance and institutional systems are challenged. Turnhout et al. (2020) argue that most of the academic research about co-production understates the concrete role of power and politics involved in its real practice. According to these perspectives, global urban planning epistemology and theory need to advance to local conceptualisations based on situated practice underlying a political context. In this regard, as Watson (2014) argues, although the co-production concept is imprecise, the study of different co-production cases can inform different practices and, by doing so, expand the knowledge of the concept.

Based on this framework, we started the research project DFG-KOPRO Int for the German Research Foundation (DFG) as a joint and comparative research on co-production practices between and about Berlin and Santiago de Chile. The research framework was focused on exploring co-production as a potential source for collective, cooperative approaches within the framework of neoliberal urban development. It focused on the potential to challenge the distribution of political power, counteract marginalisation, and affect governance models at both the local and macro levels. This context justified the selection of case studies as Santiago de Chile and Berlin, Germany. Even if both research fields are fundamentally different in the Global North and South, urban development trends share a similar context of neoliberal development, characterised by growing economic inequality, social polarisation, and the need to mobilise resources for equitable urban development through cooperation. Thus, co-production plays an essential role among the state, civil society, and private actors. Santiago has represented a substantial and spatial laid-out case of neoliberal urbanism since the 1980s, with the withdrawal of the state in terms of development strategy when the neoliberal model was applied and introduced in Chile while Berlin's urban development was intensively changed in the 1990s by the neoliberal turn. Hence, both cases act as complementary knowledge sources. Whereby the findings should be gained based on a comparative empirical study, the comparison is in this case not defined as a method but as a strategy for gaining knowledge (McFarlane, 2010).

The project started in 2019, and research teams have been jointly working on the two case study areas, closely linked to the local context, debates and citizen groups, public actors, and academics involved in the projects. The data collection for the evaluation and documentation of the research has been done. In order to open local field research, a Delphi study was employed in both cities as its test settings, to compile cases, opinions, and experiences from "experts," ranging from diverse backgrounds such as academia, public service, civil society, and the private sector.

The objective was to understand: (a) how urban co-production practices are locally conceptualised; (b) its effects on existing or resulting governance settings; and (c) the spatial results of local developments. To summarise our main findings, this article is based on the study's most representative cases, such as the case of the Maestranza San Eugenio housing project in Santiago de Chile and the Blumengrossmarkt project in Berlin. In both cases, co-production is managed over urban resources related to the provision of housing and by doing so embodies potentials as an inclusive and innovative urban development model. However, the practices of co-production represent substantial differences related to the form in which actors negotiate and are involved since the management of the projects is deeply linked to local institutional frameworks of planning and governance.

2. Theoretical Framework

According to general academic literature, co-production is generally understood as a collaborative process in which diverse actors work together to design and deliver public services or projects. It involves sharing responsibilities, decision-making, and resources to create more effective and sustainable outcomes over time. Accordingly, co-production becomes essential when citizens lack access to basic services and safe environments, for instance, when local governments do not cope with local infrastructure demands (Castán Broto et al., 2022). Co-production differs from other engagement processes such as co-design and participation. Co-design focuses specifically on involving local communities and stakeholders in the design process, but it is not related to resource and responsibility management. Participation refers to involving individuals or groups in urban planning or decision-making processes. It can range from passive involvement, such as providing feedback, to active engagement. In addition, participation always depends on, and is managed by, the actor who controls more power and resources.

On the contrary, co-production is about engaging citizens and stakeholders in all the planning and decision-making stages of urban development. It goes beyond simply gathering input and seeks to involve them in the entire process, from problem identification to implementation and management. Against this background, we understand co-production as an approach or strategy for involving communities in the planning and decision-making processes that affect their lives and livelihoods (Castán Broto et al., 2022). Therefore, co-production embodies empowerment and engagement. It can be a significant mechanism to incorporate "unheard voices" to produce more egalitarian outcomes in many critical sectors, especially under the current climate and economic crisis. In the urban arena, the political dimension is explicitly related to an integration and learning experience of diverse knowledge into planning and decision-making, thus challenging the dominance of conventional planning approaches, hierarchical governance, and siloed thinking (Schön, 1984). In this sense, it is important to highlight that decision-makers involved in co-production will always be subject to political and social pressures, and it is important to foster "horizontal" rather than "hierarchical" relationships between actors. Against this background, co-production

is both a knowledge-making and urban practice that is inevitably imbued with unequal power relations that need to be acknowledged but cannot be managed away (Turnhout et al., 2020). Hence, co-production requires deepening engagement with inequality and exclusion and involves a direct confrontation with current power asymmetries. The potential of co-production to promote wider societal transformation depends on the extent to which it addresses power dynamics and promotes inclusivity and equitable developments. Hence, it is important to recognise and address the political dimensions of co-production as well as its social and spatial results.

3. Research Context: The Challenge of International Comparative Research on Co-Production

This research is framed in empirical qualitative research in international planning theories. It explores how different approaches to cooperative urban development enable collaborative action in different stages of development and the outcome. The research framework was set to explore essential dimensions of co-production in urban development to understand: First, the urban governance, its network character and the conceptual as well as normative frameworks in which processes take place; second, the negotiation processes, their different conditions, and steering forces in different stages of development to identify and categorise the respective potential and benefits of partnership approaches; and third, to explore urban dynamics in terms of social-spatial factors, such as the capacity of projects to enable and facilitate different material development patterns of public and/or community spaces in distinction from other projects. Accordingly, data was collected based on the clarification of concepts, actors that initiate and develop cooperation, and the socio-spatial results of co-produced urban development and projects.

3.1. Methodology

The research process was based on a Delphi study in both contexts, as a qualitative and multi-level "expert" survey with 37 respondents in Chile and 40 respondents in Germany. Major trends and particularities could be identified around local "co-production" concepts, the context of actors and governance, as well as the resulting urban projects/policies/practices and their social-spatial qualities. "Experts" for the survey were defined as the variety of possible actors involved in different local co-production practices ranging from sectors like academia, NGOs and civil society, municipalities, urban development ministries, planners, and architects. The survey's following step was to evaluate (a) actor constellations and governance, (b) common-based resources, and (c) spatial typologies. The last step was characterised by in-depth research with focus groups to discuss and achieve consensus/dissensus on the learnings in cross-sectoral workshops. The topics were the effects of cooperative urban development, its action patterns of involved actors, social-spatial dynamics, and applied instruments. The purpose was to understand the influence of "co-production" on administrative structures and formal regulations and its changes. The research also included the evaluation of socio-spatial dynamics in project areas. Mappings of spatial production could recognize the different practices (Figures 1 and 3) and inform about the resulting processes, functions, urban types, building typologies, and spatial qualities.

3.2. Case Study Context and Selection and Criteria: Types and Profiles of Co-Production

As a result of the survey process, a series of urban group typologies for co-production emerged, allowing the framing of understandings along different and co-existing local profiles. These types follow the social-spatial

logic of the local context based on essential dimensions such as segregation, fragmentation, polarisation, and co-existing developmental trends. To contextualise the findings, it can be stated that demands for co-production in Santiago are mainly related to affordable housing and the "right to the city" context. The Berlin cases are not primarily restricted to affordable housing and it is likely to find a broader variety of purposes and types. In particular, the differentiation can be made concerning the engagement of the civil society (groups) in more differentiated ways.

This is increasingly supported, for example, by cultural institutions and bodies ("Kulturträger") which arise as relevant (new) players in various actor constellations. The Chilean study made clear that the term co-production as such and the associated theories per se are rarely discussed. In practice, however, processes that can be described as co-productive meet great interest, not only in the context of state projects that are intended to enable user-oriented self-government ("autogestión"). The interest also applies to historical cooperative practices from the 1960s and 70s developed with municipal, civil society, and private actors, which are today evaluated as successful approaches to overcome spatial segregation and informality towards mixed residential areas and a more inclusive urban society. These inputs, alongside the descriptive typology structure wherein the most frequently cited examples of co-production could be categorised, are the basis for this article. In both cases, the resource for co-production is housing. In the Chilean case, it is the Maestranza San Eugenio housing project, a project promoted by the movement of Ukamau residents. The German case represents the ex-Blumengrossmarkt project, an urban redevelopment developed by a group of residents and different architecture offices. Each case is described in the following section.

3.3. The Case of Ukamau and the Co-Production of the Maestranza San Eugenio Housing Complex

3.3.1. Context

The Chilean State has a subsidiary financing scheme for social housing provision based on the neoliberal rationale of urban policies. The scheme involves several actors, among them: (a) The Regional Housing and Urbanisation Service (SERVIU), which is the government entity in charge of implementing public policies for access to housing at the regional level; (b) individuals and families who meet the requirements to receive housing subsidies through Housing Committees; (c) the Sponsoring Entities, which together with the Housing Committees manage the design and construction of new housing complexes; (d) banks and other financial institutions that grant mortgage loans for the purchase of dwelling; and (e) the Housing Committees that can participate in the design and execution of housing projects through the Sponsoring Entities. As part of its operation, this subsidiary scheme is based on the delivery of subsidies to individuals or Housing Committees that must have secured a purchase option in a project of social interest or apply together with a Sponsoring Entity, which acts as a real estate developer in the design and building of the project. In both modalities, the subsidy contributes an additional amount to family savings, which must finance not only the design and construction of the project but also the purchase of the land. Thus, in the operability of this model, there are three relevant actors: The Ministry of Housing and Urbanism (central state) through SERVIU, which administratively controls the process; the Sponsoring Entities, which develop and execute the projects; and the Housing Committees, which are groups of organised families who apply with a project and land through the Sponsoring Entity.

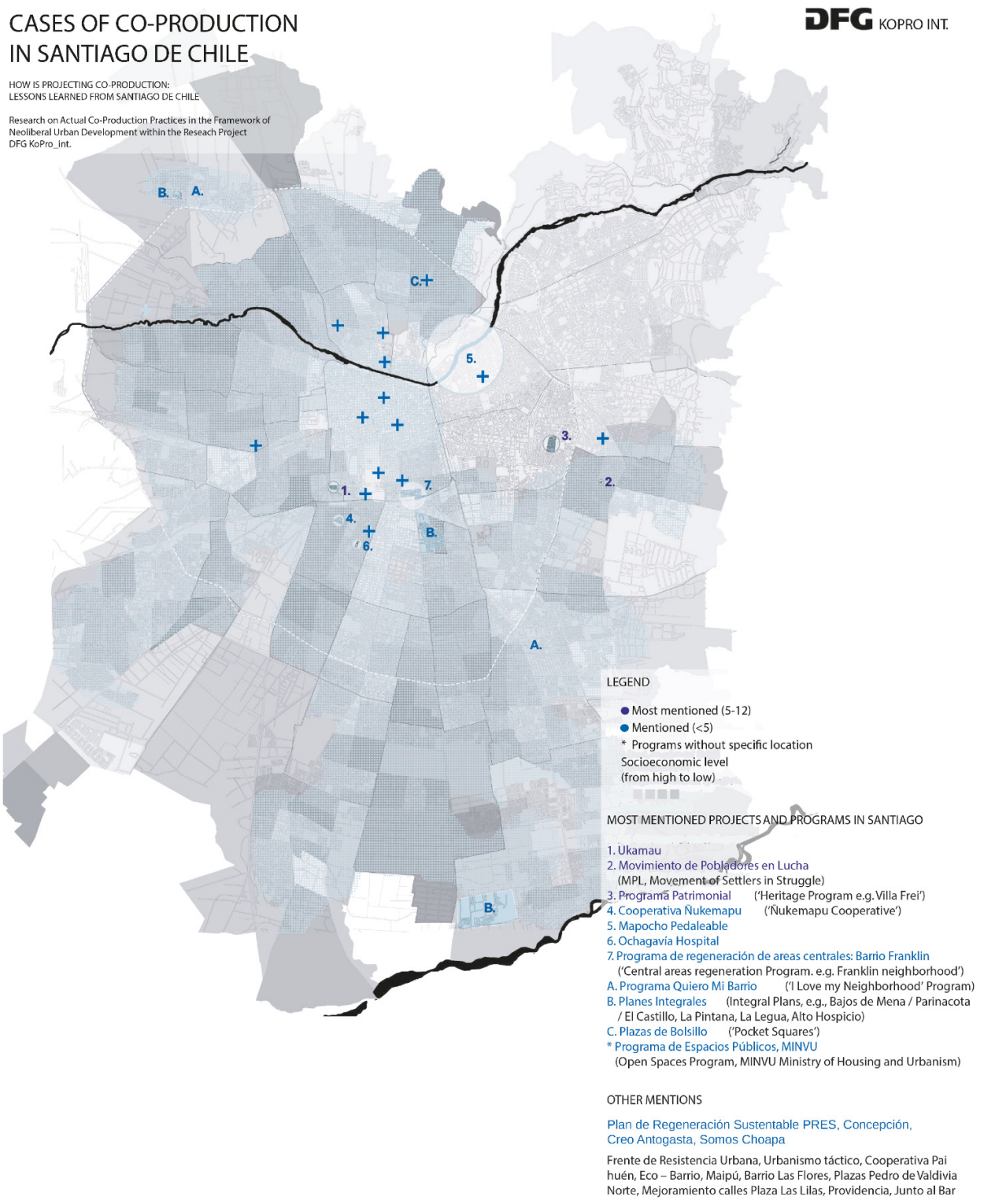

Figure 1. Cases of co-production in Santiago de Chile; in specific areas, related to state programmes for housing. The urban poor are spatially concentrated in socially disadvantaged areas of the city corresponding with the polarised landscape of neoliberal urban development. Only the projects related to environmental sustainability transcend the typical localisation and also reach affluent districts in the northeast of the city. Source: Courtesy of DFG-KOPRO Int research project.

Thus, under this model, the relationship between actors (Figure 2) is established administratively and indirectly between the state and civil society. The Sponsoring Entity fulfils the role of representing the Committee in front of the state without greater involvement from the families in terms of the definition of the structural conditions of the housing production model. In other words, there is no major level of participation of families in this model and the relation with the State is always indirect. In addition, in the Chilean case, the municipalities do not have institutionalised participation in the provision of housing except in helping the Committees to find available land. This model was originally introduced in 1980 as part of the neoliberal restructuring policies during the Pinochet dictatorship, focused on stratifying and targeting housing financing to the most vulnerable groups. Although the model was relatively successful in the 1990s concerning the mass production and provision of housing, most of the provision of housing was done over suburban land. The reason behind this decision was the incapacity to finance better locations because of the limitations of the subsidiary scheme of funding. As a result of these policies, most of the housing complexes have been built without considering access to services and employment and far from the urban cores which present major labour and economic opportunities. In this way, although the production of social housing over the last four decades has been marked by an evolving subsidiary scheme, it has not introduced structural change in its real estate system (del Romero, 2018), which has contributed to the formation of

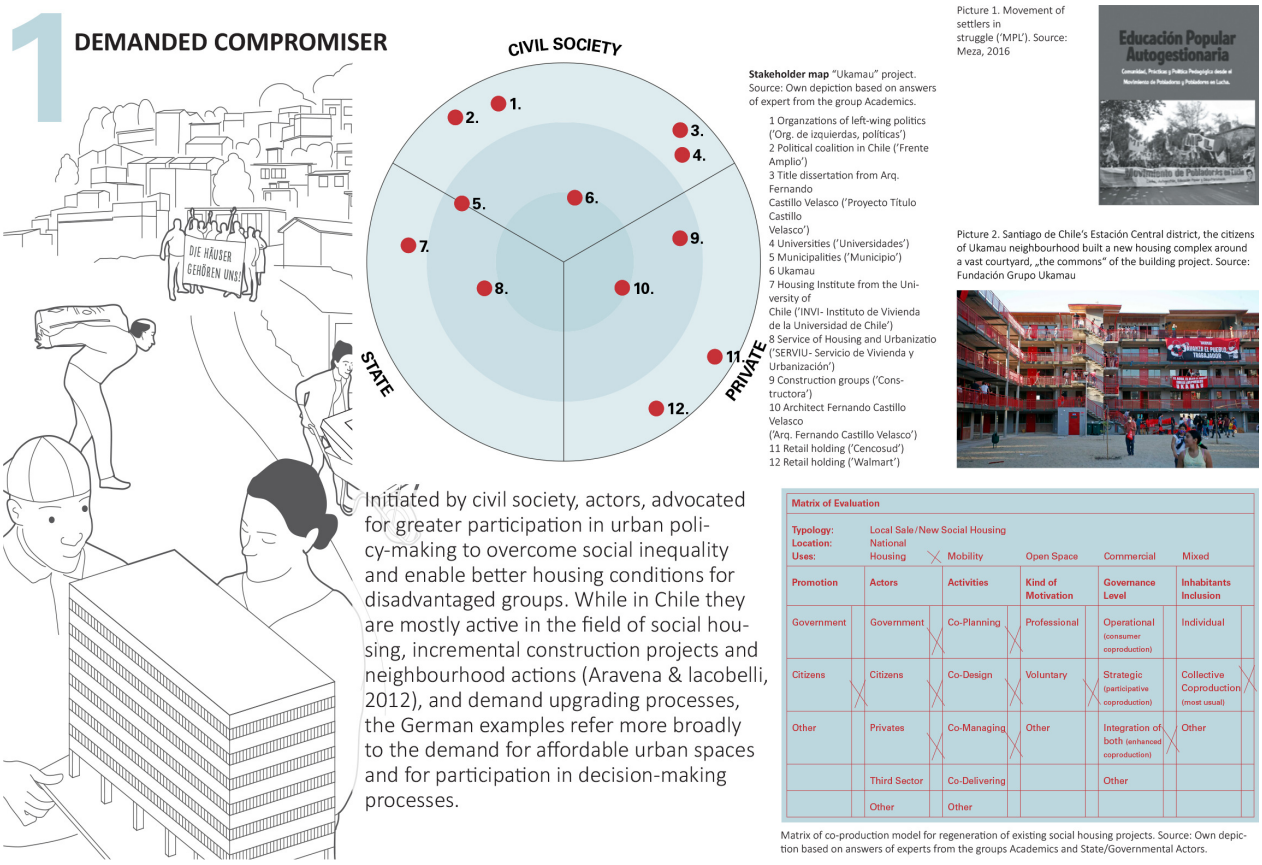

Figure 2. Type of co-production: Demanded Compromiser. Ukamau, Santiago de Chile, Chile. Initiated by organised civil society groups, the actors campaigned for a greater active role in urban decision-making and project development to overcome social inequality and provide better living conditions for disadvantaged groups. Source: Courtesy of DFG-KOPRO Int research project.

socially segregated urban areas with few opportunities for integration to rest of the city. Although this aspect has been widely studied and questioned (e.g., Aravena et al., 2005; Fuster-Farfán, 2019; Hidalgo Dattwyler et al., 2022; Pincheira Hill, 2014), it is not the focus of this article. However, this situation creates a context in which a series of social movements arise demanding not only access to better housing but also better locations as part of a generalised claim based on the right to decent housing and cities.

3.3.2. The Ukamau Movement and the La Maestranza San Eugenio Project

It is precisely as part of this context and the crisis of access to housing in Chile that the Ukamau movement arises. The Ukamau Residents Movement originated in 2010 when members of the Ukamau Cultural Centre decided to create the movement. From the beginning, they proposed to work in defence of the right to housing and the construction of a fairer and more inclusive city. Together with a group of 424 families from the Commune of Estación Central in Santiago de Chile, they began a process of mobilisation and pressure on the government through a series of systematic demonstrations and political negotiations. In this way, they began to establish their local demands in the public debate until they achieved the building of a mega social housing project in Maestranza San Eugenio for their families, in a central area of the Santiago metropolitan area, in the Estación Central district. In this regard, one of the main objectives of the movement was to acquire land in this central district, where the residents lived. For this, Ukamau obtained a commitment from the State Railway Company (Empresa de Ferrocarriles del Estado—EFE) in terms of handing over a part of the property of the old Maestranza de San Eugenio for the building of the housing project. This process involved a strong negotiation process with EFE putting pressure on the SERVIU of the Metropolitan Region of Santiago, through countless protests and political demonstrations by Ukamau. Finally, after wide mobilisations, the movement managed to push SERVIU to acquire the land from EFE to build the Project.

Thus, the operation involved the purchase of about two ha of land from EFE in Estación Central district in order to save it for the housing project named Maestranza San Eugenio. Additionally, the Maestranza San Eugenio project was conceived under a housing self-management model, the result of a co-design process between the members of the Housing Committee, the 424 families, their political leaders and the architects who collaborated pro bono. The architecture office in charge was led initially by the famous Chilean architect Fernando Castillo Velasco, who personally participated in the design of the project. In this way, the movement and its architects were able to establish a different design model for the housing complex, according to the socio-community characteristics desired by its community, far exceeding the traditional density of units with these characteristics in suburban areas. Indeed, the flats were designed with more surface than the standard allowed and were distributed according to the level of participation in the Ukamau Social organisation. At the same time, the common spaces included community facilities and playgrounds inside the courtyards of the complex. In this sense, the Master Plan included collective spaces designed specifically according to the necessities of the community. This process pushed SERVIU and the Ministry of Housing regarding the minimum standards required for this type of project. Finally, the movement established a management committee for the Complex based on democratic votes and a regime of periodical participation beyond the requirements of the Chilean condominium law.

To summarise, Ukamau's experience was based on a series of conflicting negotiations and exceptional collaborations which managed to pressure and change the institutional settings prescribed for this type of housing policy. In the first place, the movement implemented a political and protest strategy against the

Ministry of Housing to obtain the purchase of EFE's land by SERVIU, exceeding the amount of subsidy required to acquire high-value land with central characteristics. In turn, the movement did not apply through a sponsoring Entity but was partially transformed into it, subordinating the figure of architects to a community co-design process. Finally, through the political capital obtained and with the support of other figures of public relevance, they managed to establish a design and management model with different standards than those traditionally allowed with the subsidiary model of social housing and the condominium law in the periphery. In this way, the development process of the Maestranza San Eugenio as a whole was based—in practice—on flexible horizontal governance, in which the positions of actors were levelled based on their political capital. Consequently, although this dimension generated research interest by itself, in terms of innovation and conflictive negotiation, the political process led by Ukamau was able to set precedents for other housing movements.

3.4. The Case of the Blumengrossmarkt and the Co-Production of the Südliche Friedrichstraße Area in Berlin Kreuzberg

3.4.1. Context

The Südliche Friedrichstadt in Berlin has a high density of programmes and projects, some of which overlap in their objectives, spatial spread, and constellation of actors. The area where the Blumengrossmarkt project is located was formally designated as a redevelopment area in 2011 and was subject to the "Special Urban Development Law," which means that redevelopments follow the "simple procedure" in which the specific laws and provisions of urban redevelopment are not applied. Instead, redevelopment procedures are accompanied by an advisory board, which consists of experts from the unit "Stadtkontor," a local unit and organising partners for the redevelopment such as architects, planners, representatives from the district and the senate, as well as local actors. The local actors are elected among those affected by the redevelopment as tenants, tradespeople, owners, and educational and cultural institutions. As a final programme, the südliche Friedrichstadt was registered as a Milieuschutzgebiet in 2017. As an urban development ordinance, the registration of "Milieu—Schutzgebiet" aims to maintain the social structure within a district. Although this has no direct impact on existing or new institutions within the area, this ordinance regulates the district's possibilities to intervene in the housing and development market, e.g., to slow down to avoid privatisation patterns towards a more inclusive development. The aim in these areas was to achieve a high degree of diversity and a mixture of residents and usage structures in its redevelopment. Since the site's attractive and central location in Berlin was undergoing a massive gentrification process, which included expensive housing in the neighbourhood, there was a risk of privatisation of public land. The living area was oriented towards the community and has a correspondingly designed development with public space as well as communal areas. In addition, the local advisory board acting in the area would also work with other actors in a new urban instrument, the Bauhütte, a temporary building at the plot, which would serve as a place for undertaking a series of meetings to inform about current building projects, discuss the development objectives and undertake joint planning sessions. In addition, the intention of collective development promoted by civil society, architects and stakeholders in the area was to redress this trend, notwithstanding the current need for development, by launching and working on different formats such as the concept-linked award procedure for the central flower market site. Two out of five surrounding land plots were sold to the highest bidder, while the other three fields were awarded as part of Berlin's first Konzeptverfahren, the concept-based real estate procedure.

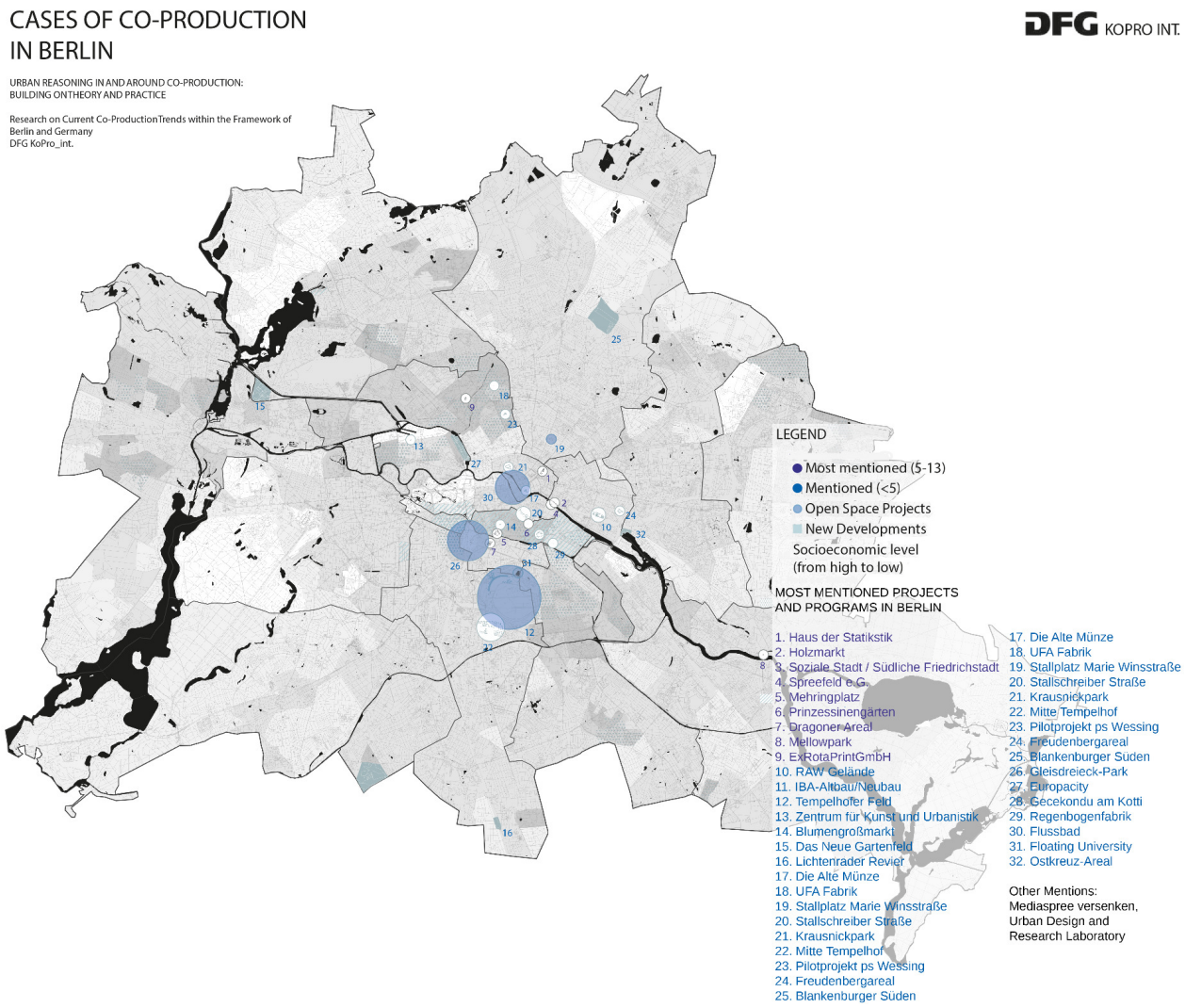

Figure 3. Cases of co-production in Berlin, Germany. Diverse settings and types of projects in the city, based on public policies, programmes, projects organised by privates and the organised civil society as well as diverse institutionalised forms of urban development oriented towards the common good. Source: Courtesy of DFG-KOPRO Int research project.

An innovative multi-stage qualification process was developed in collaboration with the Friedrichshain-Kreuzberg local authority, the Berlin Senate Department for Urban Development and the Environment, local stakeholders (Figure 4) and independent experts, whose aim was to support the ongoing project and assure the quality of architecture and urban development for a social mixture. The quality of the submitted concept is since then determined by the development concept, based on diversity in utilisation, social mixture and ecological aspects. Concept procedure is undertaken nationwide today and represents a new urban planning instrument for urban design and architecture competitions, which allows governmental actors to award land plots in lease not to the highest bidder, but rather to the party with the best social-spatial concept. In this term, it can be stated that the co-production that started at the Blumengrossmarkt was the source to introduce new urban instruments, scaling up from the project to an instrument as the concept procedure, creating a space of new possibility within the market forces of urban development for more alternative and cooperative forms of urban processes.

3.4.2. Integrative Building Project at Blumengrossmarkt

In 2010, the wholesale flower market in the area was shut down and gave rise to the development. The hall itself had already been acquired by the Jewish Museum in 2009 and was then converted into the Academy of the Jewish Museum. A private initiative suggested converting it into an art gallery, but the city of Berlin soon made clear that the Jewish Museum opposite would have room for an expansion. The remaining site—at least two and a half ha in a good inner-city location—was to be sold to the highest bidder. The local advisory board and the further association of curators, politicians and artists had now become a well-organised project office, which highlighted in the media the potential of the remaining property for the surrounding area and now advocated for an art and creative quarter. The idea quickly found political support at the district level. The state-owned Berliner Großmarkt GmbH, which as the formal owner has been sensitised to city politics thanks to other market hall sales, also played a role. To achieve the creative quarter as desired, an award procedure was carried out in 2010, which would not only take into account the value of the bids but also the usage concepts. The Konzeptverfahren applied in its first version and the *Blumengrossmarkt* (ex-central flower market site) represented a test case to develop the procedure and started as a bidding process. Three building projects were convincing and started within this framework, the project Integratives Bauprojekt am ehemaligen Blumengrossmarkt as the self-building cooperative in collaboration with architects ifau and Heide & Von Beckerath, the "Metropolen-Haus" by architects and developers as bfstudio Partnerschaft von Architekten mbB and the Frizz23 building by Deadline Architekten and Forum Berufsbildung.

The building area included the former wholesale flower market, which was developed beside diverse housing units into a cultural and creative quarter. In the southernmost part, the area was additionally built for social institutions such as a school, urban gardening projects, and open areas. The buildings contain flats, studios, and commercial spaces and thus attempt to combine living and working. The self-building cooperative has a stake in the project together with private building group members and social sponsors. The three projects aim to achieve a high degree of diversity and a mixture of residents and usage structures. On the ground floor, studios and commercial units have been built, creating a "communicative zone." The living area is oriented towards the community and has a correspondingly designed development as well as communal areas. For example, one house has shared workrooms and workshops, terraces, communal gardens, a laundry room, and a summer kitchen. In addition, the desired mix in the house is supported by different flat sizes and types. The project interweaves three different financing models: residential, studio, and commercial units are used by the self-building cooperative Berlin eG, private developers and a social sponsor. The favourable land price linked to the concept can thus cross-subsidise the residential and commercial units. In short, the survey confirmed that co-production favours the interaction of different actors in urban development and changes in governance structures can be identified. In particular, the key is to stimulate the development of knowledge as a fundamental resource. In this development, mandates such as steering committees and advisory boards were important for further distribution to enable the group to act further in knowledge building. Within knowledge acquisition, power structures are changed through expertise about processes, sources, and networks to develop the project and move forward. In terms of planning instruments, this knowledge also arises beside the project itself in a broad exchange in local, national, or international networks of actors. In terms of project design, co-designing and acquired knowledge enable particular civil society actors to articulate and implement needs in their future living environment in terms of affordable housing solutions and infrastructure. In the same way, their contribution made a significant move towards changing the knowledge pool in urban development projects.

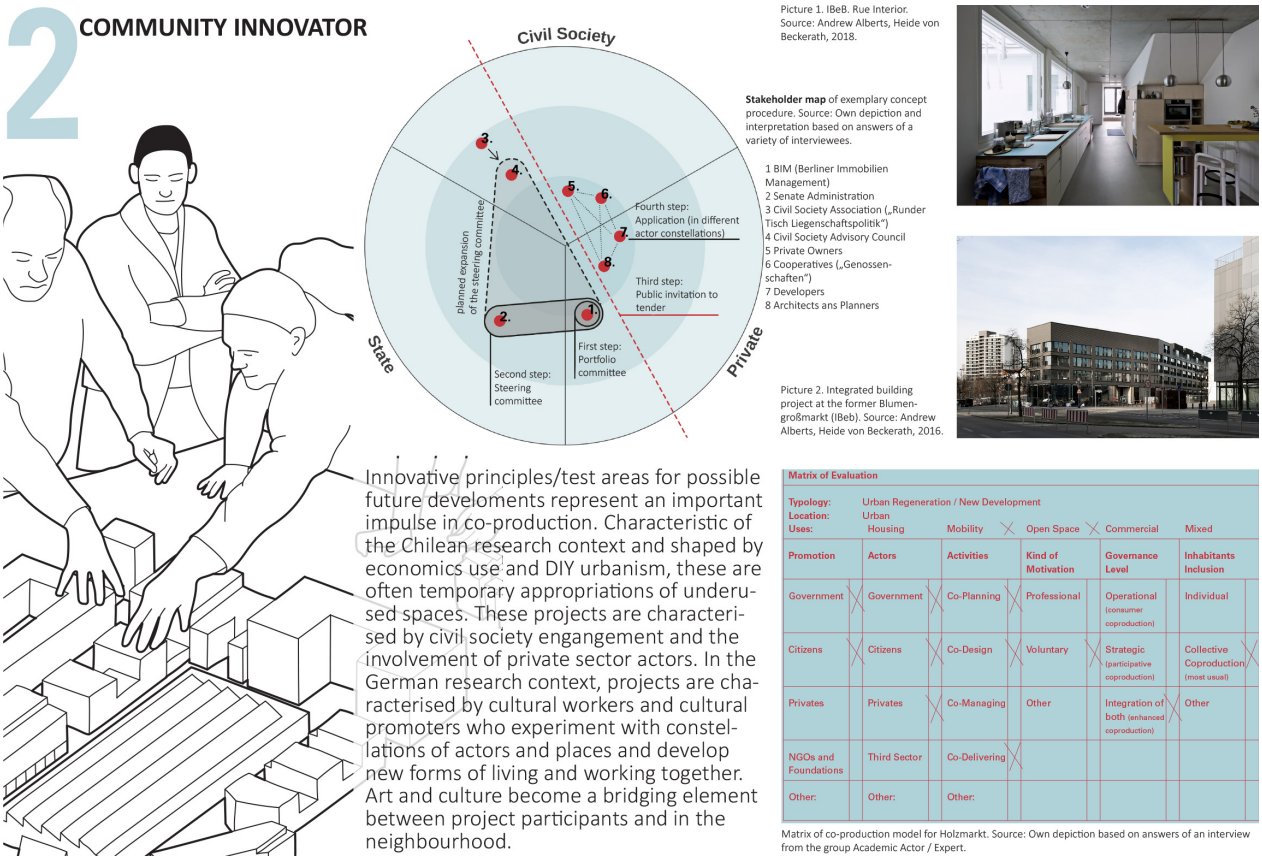

Figure 4. Type of co-production: Community Innovator. Blumengrossmarkt, Berlin, Germany. Innovative planning and designing processes/test fields for possible future urban developments are important drivers for co-production dynamics. These projects resulted in changes in urban policies, such as the "Konzeptvergabe," which is active today in different German cities as a new urban policy for more "inclusive" urban development. Source: Courtesy of DFG-KOPRO Int research project.

4. Discussion

The study of both cases illustrates that urban co-production can be conceptually traced back to Ostrom's definition. However, it is strongly related to struggles for the right to the city in terms of the necessity to protect private interest over public urban domain and needs in current and future urban development. In particular, this approach can be found when diverse actors from different sectors are acting toward a shared outcome in their design and management process. Nevertheless, the political way in which this occurs varies according to institutional and governance frameworks and this has socio-spatial and institutional consequences. In this sense, some relevant reflections from the research can be obtained related to co-production implications in planning practice related to governance, negotiation, and the socio-spatial dimension as follows.

4.1. Governance Dimension

4.1.1. Urban Co-Production Can Be Conflicted or Collaborative

Urban co-production is not necessarily a consensual institutional practice among actors. In a centralised and more vertical institutional governance framework, as in the Chilean case, participatory practices are precautionary and principally consultative. In the case of Ukamau, co-production emerges as a forced model in which pressured government actors must "adapt" institutional models and practices to drive a plan. In this regard, conflicting negotiation implies yielding power regarding attributions and decision-making space. This is subject to a process that forces together different actors, creates socio-political awareness and thus strengthens the ability of communities to act. Conversely, in the German case, co-production could take the form of collaborative relations in which parties and actors are linked to yield power and negotiate to obtain a more desirable agreement. It evolves from the contestation to a conceptual framework, as a process in which a common resource is created through the contribution of actors from different organisations.

4.1.2. Co-Production of Knowledge Does Not Necessarily Translate Into Structural and Institutional Change

Both case studies confirm that the involvement of civil society groups is often based on a concrete need for action and recognised shortcomings and thus usually leads to individual spatial and functional solutions. The socio-spatial dimension usually requires a committed community to ensure the security and development of the project. It relies on a mutual, locally-based learning process to gain financial resources to realise the projects. This competence, where knowledge is shared to overcome the deficit, becomes the decisive impetus for development. As it was observed in Ukamau's case, even with creating an emergent model of co-production of housing which involved different relationships among planning departments, the designers and the community, the different innovations in terms of collective knowledge in the process were not translated into the housing policy.

4.2. Negotiation Processes and Network Dimension

4.2.1. Urban Co-Production Occurs in Highly Contested Fields Over Critical Resources Involving Different Rationalities

In all the cases addressed by the research, co-production experiences are related to urban resources critical for urban living such as housing, water provision and ecosystem services. Housing provision is particularly sensitive in a global crisis in which all the institutional systems are pressured for rapid solutions. In this regard, the conflict over common resources engages different actors with diverse perspectives and rationalities. Ukamau's case is paradigmatic in this context since the movement's political strategy forced different institutional arrangements through social protest and actions. This struggle resulted in the incorporation of additional actors to achieve the expected outcome in a restrictive subsidiary and financial context of housing provision. On the contrary, the German cases are based on a more flexible institutional system that can adapt to the demand but can also generate new and innovative constellations of civil actors and urban programmes. In this regard, co-production can be found in cases ranging from neighbourhood redevelopment programmes to specific integrative art production clusters and supporting policies.

4.2.2. Urban Co-Production Works as a Dialogical and Innovative Process in the (Re)Negotiation of Power Relations and Decision-Making Processes

Urban co-production involves different arrangements and dialogical processes among actors. In both cases, the research illustrates that these relationships are not always institutionalised and evolve through different stages by creating new rules and institutional practices in which new temporary alliances are created circumstantially (Figure 5). Particularly in the German case, along this process, negotiation is a regular aspect of engagement and institutional planning frameworks support involvement among actors. At the same time, decision-making is shared, equalising the power and legitimacy of different actors. As different as the local modes of action are, it can be deduced from the research that the arrival of large private actors and the simultaneous withdrawal of the state has caused a clear shift towards a more complex network of actors involved. The consequence is a conflictive urban development in which different strategies are used to overcome power asymmetries, with a constant process of negotiation and joint decision-making in the production of space.

4.2.3. Cross-Scale Approaches (Scaling-Up) as an Implementation Method and to Secure Co-Production Practices

In both cases, the concept of co-production as such and the associated theories per se, are novel but somewhat elaborated, at least in institutional practice. In practice, however, processes that can be described as co-productive are met with great interest from academics and scholars because, in the Chilean case, the traditional trend to user-oriented self-government ("autogestión") by involving organised movements or communities is implied. In this regard, there is an agreement in the academic discussion that co-production can be seen as the key to creating viable and inclusive cities. As diverse as discussions are, there seems to be a consensus that it represents a new form of participation that allows power relations and decision-making processes to be renegotiated in the nexus of individual and collective interests.

4.3. Socio-Spatial Dimension

4.3.1. Co-Production Creates New Socio-Spatial Organising Principles

Although institutional frameworks do not necessarily adopt governance innovation, spatial outcomes of co-production reveal new social possibilities around the urban fabric. Thus, innovation in terms of social organisation around a common or critical resource allows the creation of new spatial settings that reframe conventional urban and architectural programmes based on the social needs of communities. In this regard, in particular, from the German case: The neighbourhood space for planning actions is considered and linked to the overall planning level. This activation of local resources for spatial organising principles helps to develop heterogeneity and multifunctionality as the basis for community-based renewal programmes. Common uses and the development of unused areas become possible sources for collective living concepts. In addition, projects such as the Blumengrossmarkt secure social land use programmes with new instruments, such as concept procurement. Hence, co-production can create new social-spatial morphologies that allow new contributions to community uses, in urban programmes and for collective housing.

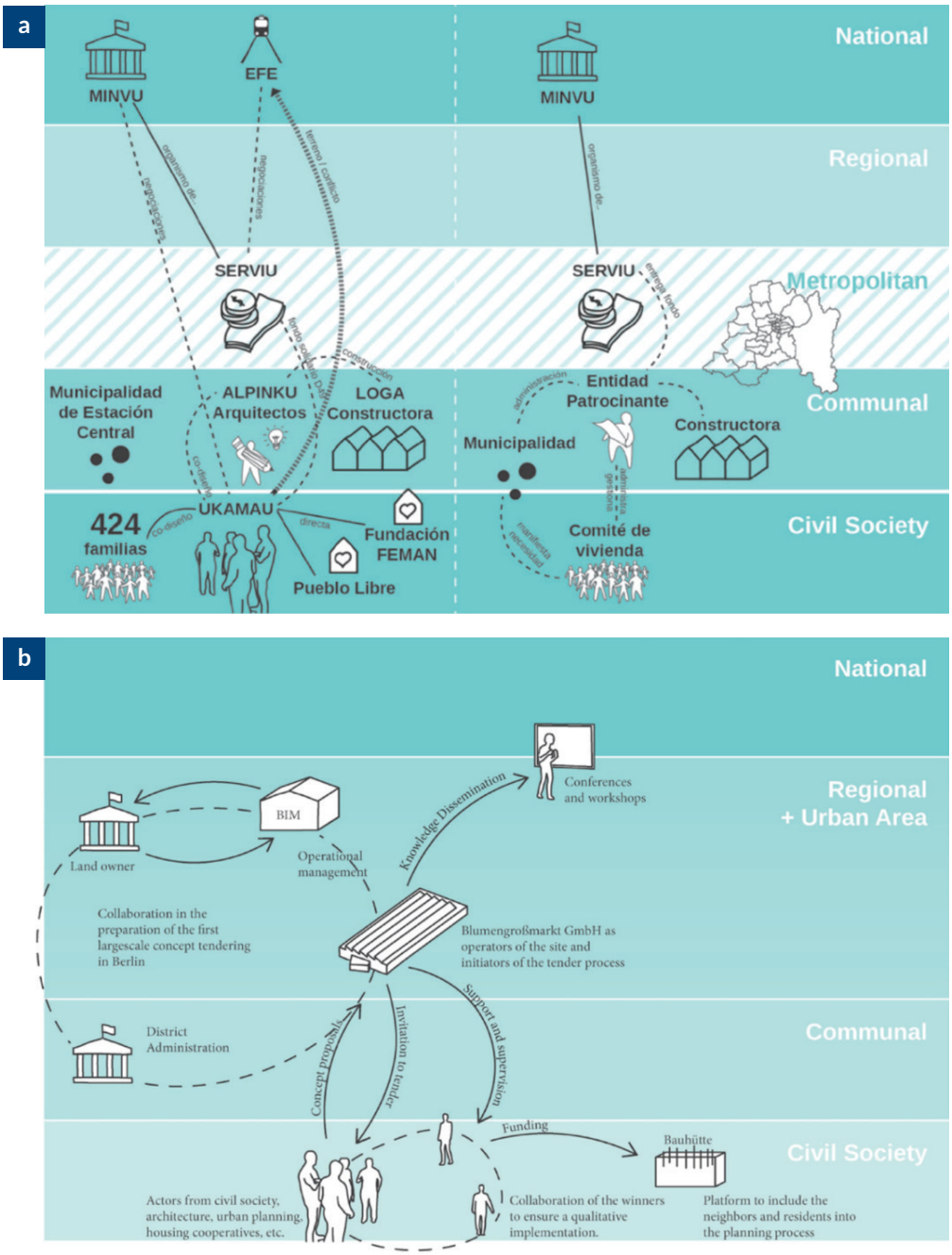

Figure 5. Negotiation processes and network analysis: Contested (a) vs. Collaborative (b). From the case study in Chile of the Ukamau project, it can be concluded that project structures and processes undertaken are primarily based on protest. A further co-produced development of the project, promoted by co-production agendas and cross-scale approaches defined as a goal in theoretical discourse (e.g., Watson, 2014) as the ability of co-production to enable actors to enter into sharing of resources still stands out. In the German context, from the development of the ex-Blumengrossmarkt project, the implementation capacity and procedures to create a cross-scale approach play a major role in enabling actors and developing the project further. Key topics in the collaboration are a high diversity of mandate forms in the corporations that have the possibilities because of legitimisation to try to close governance gaps; involved actors from various areas (artists, cultural institutions, universities and private actors) have their own networks and co-produce knowledge on how to develop the project further. These practices require from the acting collective a deep knowledge of regulatory, persuasive, or financial instruments and the development of a set of rules in which the resources can be managed jointly. Source: Courtesy of DFG-KOPRO Int research project.

4.3.2. Co-Production Under Neoliberal Hierarchical Urban Policies Does Not Overcome Governance Gaps or Fragmented Urban Development

From the Chilean research context, it can be observed that co-production is geographically concentrated in socially disadvantaged areas of the city and usually arises due to a need for resources which is exacerbated by austerity measures or inadequate provision. Consequently, despite many of its defining features within projects, co-production does not necessarily lead to greater inclusion in a broader sense. As mentioned, these processes contribute to community empowerment and the appropriation and preservation of living space at the local level but do not imply improving institutional processes.

Indeed, it cannot be confirmed that governance gaps are closed and that locally (successful) interventions at the project level are, in fact, relevant at the macro level. From the German research, it can be reported that within the existing diverse and dynamic projects, co-production arguably has innovative potential to challenge the traditional spatial planning frameworks, through the involvement of a large number of new actors, personal commitments, new ideas, practices, and experiments. In this regard, the possibility of "scaling-up" of projects and urban policies leaves the possibility open to act and incorporate the specific project context to a greater part of society. This is particularly important to social inclusion since projects introduce inclusive housing models for disadvantaged parts of the society through social mixed over tenure and renting models.

5. Conclusions

Our research confirms the transformative character of co-production to involve different and diverse actors in terms of critical provision of urban resources. The general approach, focused on providing and optimising urban services (Moretto & Ranzato, 2017), is concentrated on several dimensions such as planning, design, and management, on the baseline of mutual collaboration. However, as we confirm in our research, the main critical aspects of co-production are related to the negotiation of actors in asymmetric power relations and the capacity of the governance institutional framework to assume them. In this sense, both case studies, Santiago de Chile and Berlin, were key for understanding this. In Germany, related local discourses to possible actions in the context of the ongoing privatisation of spaces and processes and its occurring conflicts, as well as social and spatial impacts. In Chile, the reference frame helped, in particular, to discuss collective processes and, above all, new institutionalised forms of urban development oriented toward the public good. Thus, the comparative and complementary analysis of two different local experiences of co-production allowed us to expand the dimension of conflict around the concept. Specifically, co-production can be a conflictive process when actors are not represented in equal conditions and when they pursue different objectives related to the urban resource in question. Institutional frameworks and capacities play a relevant role in its capacity to foster and absorb the implications of the co-production approach. These implications are mostly related to the diverse interests and rationalities of different actors. In this regard, it is valuable to highlight that actors are always political; they have power, resources, and strategies that can be mobilised. At the same time, this mobilization through conflict has consequences for institutions and communities, which can be critical.

As Ukamau's case illustrates, co-production does not occur in asymmetrical political circumstances, and actors can start disruptive processes of urban transformation. This can happen when resources are critical for communities and organisations; their claims can start a process of radical innovation that can pressure institutional frameworks. However, this is not necessarily a guarantee of structural change in governance

and planning institutional models. On the other hand, Berlin's case shows a partially underlying base for institutional learning. In this case, it is clear that from the project context, it requires a translation into the administrative and political frame. In addition, these boards can actively be part of budget decisions for urban policies and the development of instruments such as, for example, the "Konzeptverfahren." In the case of Berlin, this is related to the development of contested mandates that have been acquired by different actors as well as the development of boards that act to open up the political decision-making process, from the "local ground" to "political decision-making table." In this regard, for the last phase of the "scaling up" of projects, institutional change needs political action in the formal state apparatus. Thus, planning and implementation processes that are promoted by co-production agendas and enable cross-scale approaches should be installed at the cultural level of institutional systems. Otherwise, higher levels of participation and inclusion on planning as co-production promotes can be highly conflictive for all the actors involved.

In addition, it is important to recognise the limitations of our research in terms of the representativity of the cases for planning frameworks and applied instruments. Since, for example, Ukamau's case seems to be a very particular experience in which co-production appears as an emergent process, while the rest of the cases addressed in the research show less conflictive processes and more involvement in the legal planning framework. On the other hand, the purpose of the research was to explore the capacity of co-production to challenge prevailing power and institutional settings. In this regard, the German case helped to contextualise the capacity to learn about planning instruments.

Lastly, this aspect is related to the conditions and rules that have to be created for co-production. Only a well-established set of rules can solve disputes among different actors. Furthermore, this process needs to secure transparency, traceability, and responsibility in cooperation, but mainly to establish a culture of collaboration beyond political and ideological divergences.

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Conflict of Interests

The authors declare no conflict of interests.

References

Alfaro d'Alençon, P., & López Morales, E. (2018). The urban as a concrete utopia? Co-production and local governance in distinct urban geographies: Transnational learning from Chile and Germany. In P. Horn, P. Alfaro d'Alencon, & A. C. Duarte Cardoso (Eds.), *Emerging urban spaces: A planetary perspective* (pp. 65–85). Springer. https://doi.org/10.1007/978-3-319-57816-3_4

Aravena, S., Rodríguez, A., & Sugranyes, A. (Eds.). (2005). *Los con techo: Un desafío para la política de vivienda social*. Ediciones SUR.

Castán Broto, V., Ortiz, C., Lipietz, B., Osuteye, E., Johnson, C., Kombe, W., Mtwangi-Limbumba, T., Cazanave Macías, J., Desmaison, B., Hadny, A., Kisembo, T., Koroma, B., Macarthy, J., Mbabazi, J., Lwasa, S., Pérez-Castro, B., Peña Díaz, J., Rodríguez Rivero, L., & Levy, C. (2022). Co-production outcomes for urban equality: Learning from different trajectories of citizens' involvement in urban change. *Current Research in Environmental Sustainability*, *4*, Article 100179. https://doi.org/10.1016/j.crsust.2022.100179

del Romero, L. (2018). Cartografías de la desigualdad: Una década de conflictos de vivienda y nuevas resistencias en Santiago de Chile. Análisis del conflicto de la Maestranza de San Eugenio. *EURE (Santiago)*, *44*(132), 47–66. https://doi.org/10.4067/s0250-71612018000200047

Fuster-Farfán, X. (2019). Las políticas de vivienda social en Chile en un contexto de neoliberalismo híbrido. *EURE (Santiago)*, *45*(135), 5–26. https://doi.org/10.4067/S0250-71612019000200005

Hidalgo Dattwyler, R., Vergara Constela, C. D., Gutiérrez Aguilera, D., Capetillo Constela, C., & Alvarado Petterson, V. (2022). Su casa, su deuda. La política de vivienda chilena entre la financiarización, la subsidiariedad y la integración social. *Revista INVI*, *37*(105). https://doi.org/10.5354/0718-8358.2022.63809

Lefebvre, H. (2003). *The urban revolution*. University of Minnesota Press.

McFarlane, C. (2010). The comparative city: Knowledge, learning, urbanism. *International Journal of Urban and Regional Research*, *34*(4), 725–742. https://doi.org/10.1111/j.1468-2427.2010.00917.x

Moretto, L., & Ranzato, M. (2017). A socio-natural standpoint to understand coproduction of water, energy and waste services. *Urban Research & Practice*, *10*(1), 1–21.

Ostrom, E. (1996). Crossing the great divide: Coproduction, synergy, and development. *World Development*, *24*(6), 1073–1087.

Pincheira Hill, V. P. (2014). Políticas habitacionales y la falta del derecho a la vivienda en Chile. *Revista de Derechos Fundamentales*, *11*, 57–92. https://dialnet.unirioja.es/servlet/articulo?codigo=5605966

Robinson, J. (2022). *Comparative urbanism: Tactics for global urban studies*. Wiley.

Schön, D. (1984). *The reflective practitioner: How professionals think in action*. Perseus Books Group.

Turnhout, E., Metze, T., Wyborn, C., Klenk, N., & Louder, E. (2020). The politics of co-production: Participation, power, and transformation. *Current Opinion in Environmental Sustainability*, *42*, 15–21.

Watson, V. (2014). Co-production and collaboration in planning–The difference. *Planning Theory & Practice*, *15*(1), 62–76.

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