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Assessing the Transformative Potential of Methodological Innovation in the Planning Sector: A neighbourhood-scale experimentation in Helsinki

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Despite the necessity and urgency of sustainability actions, urban sustainability transformations are practised only to a limited extent. This study argues that methodology and methods are crucial for advancing and deepening sustainability transformations in cities, and that methodological innovations are necessary in several sectors, especially in urban planning and governance. Towards this target, this article presents an urban experimentation undertaken in the Laajasalo neighbourhood of Helsinki City (Finland), where the use and transformative potential of design-based co-creation methods and methodologies were tested through a series of multi-stakeholder workshops. The workshops tackled the transformations of local social-ecological systems with residents and city planners, convening them in collaborative, systemic, embodied, creative and empathetic thinking.

The results indicate that the applied design methods facilitated capacity building for urban sustainability transformations by contributing to the re-connection of urban societies with ecological systems and the re-structuring of incumbent planning processes and practices. The workshops enabled co-learning between residents and planners, fostered collaborative dialogues, and stimulated discussions on nature values, multispecies wellbeing, and speculative nature futures. The findings suggest methodological shifts can foster the complexity framing of urban planning practice and contribute to delivering ecoliterate and

collective responses to pressing urban challenges, integrating systems, futures and multispecies thinking. Furthermore, the findings address the need to expand the roles of local governments from urban planning authorities to transformation leaders that infrastructure societal change by facilitating co-creation as a capacity-building and co-learning process.

KEYWORDS: Co-creation, methodological innovation, urban sustainability transformations, urban planning, design, transition design, social-ecological systems, leverage points.

RSD TOPICS: Methods & Methodology, Architecture & Planning, Cases & Practice

Introduction

Our societies' ways of living keep pressuring the limits of planetary boundaries (Raworth, 2018), resulting in biodiversity loss, ecological degradation, and increasing social and economic inequalities (IPBES, 2019). Addressing this polycrisis, sustainability transitions and transformations research suggests comprehensive changes in how our human societies meet their needs across socio-technical, socio-institutional, and social-ecological systems (Loorbach et al., 2017). However, this is not a straightforward task; it involves multiple conceptual and practical challenges that still require further research.

Sustainability transitions and transformations refer to large-scale, multilevel systems-change processes in which multiple sectors and parties converge their efforts towards sustainable futures, implementing interrelated strategies and actions across sectors and scales (Hölscher et al., 2018; Geels, 2011). Even though a fundamental consensus has formed on the necessity and urgency of sustainability transitions and transformations, action and practice lag behind theoretical discourse (Patterson et al., 2017; Salomaa & Juhola, 2020; Fischer et al., 2007). This paper argues that methodology and methods are crucial for leveraging transitions and transformations, and that methodological innovations are necessary in several sectors, especially in planning and urban governance.

The need for methodological innovation in the planning sector stems from three primary characteristics of sustainability transitions and transformations. First, societal systems and change processes can be considered as complex adaptive phenomena. Current governance models fall short in understanding and steering such dynamic phenomena. Advancing sustainability transitions and transformations requires moving beyond conventional, hierarchical decision-making towards dynamic, nonlinear and integrated processes of collaborative knowledge production and action (Frantzeskaki et al., 2025). Second, sustainability transitions and transformations require breaking out of incumbent systems, structures and practices, challenging settled perspectives and paradigms to prefigure alternative societal futures (Loorbach et al., 2017). The long-standing mindsets that oriented the exploitative and instrumentalised relationships modern societies have built with Earth systems and nature need to be acknowledged and critically altered (Tsing et al., 2019; Gupta et al., 2023; Tschakert et al., 2021). Novel methods and methodologies can enable such reflective processes at the level of axiology and do the groundwork for radical change. Third, sustainability transitions and transformations are multidimensional phenomena; they entail cognitive, emotional, social and organisational challenges (Vogel and O'Brien, 2022; O'Brien and Sygna, 2013). There is a need for exploring sustainability transformations through a range of approaches. This suggests adopting methodological pluralism in exploring, understanding and acting for societal change, as manifested in systemic design approaches (Jones, 2014; Ryan, 2014; Fitzpatrick et al., 2024).

Despite the need for methodological innovation in multiple societal sectors, scholars warn that sustainability transitions and transformations remain empirically understudied with a focus on methods and methodologies (Salomaa & Juhola, 2020). Against this background, the main objective of this study is to enhance the understanding of how methodological innovation in the planning sector, when anchored in transition design and co-creation, can influence and accelerate urban sustainability transformations. Through a neighbourhood-scale urban experimentation in the City of Helsinki, Finland, we explore the research question: *how, and to what extent, the use of design-based co-creation methods and methodologies in the planning sector can contribute to advancing and deepening urban sustainability changes*. To guide this inquiry, we propose a perspective that synthesises design research with Leverage

Points thinking on systems change (Meadows, 1999), the three realms of deep transformations (Abson et al., 2018), and transformative learning perspectives.

Design research has much to offer for the methodological advancement of sustainability transitions and transformations practice, such as through the implementation of design-based processes, tools and methods in governance processes (Loorbach, 2022). Based on this premise, the Design for Sustainability Transitions and Transformations (DfsTT) approach has emerged from the intersection of transition studies and design research, developing integrative conceptual frameworks and action-led methods (Gaziulusoy & Erdoğan Öztekin, 2019; Irwin, 2015). DfsTT proposes a wide range of methods, including visioning and design fiction, for instance, to imagine critical urban futures (Gaziulusoy & Ryan, 2017; Yu, 2025), transition pathway co-design to support high-level policy making (Lähteenoja et al., 2023; Hyysalo et al., 2019), and real-world experimentation to mobilise systemic change in local contexts (Ceschin, 2014). DfsTT studies demonstrate well that methodological plurality holds immense potential for rethinking urban transformations and for framing, planning and facilitating change in novel ways (Kossoff and Irwin, 2021; Baibarac-Duignan and van den Eijnden, 2025).

Next, we present our methodology and case: a neighbourhood-scale urban experimentation on the use of DfsTT approach and design-based co-creation methods in planning.

Methodology

Cities and urban lifestyles are key areas for implementing sustainability strategies and actions. More than half of the world population lives in cities. Most cities rely on carbon-dependent infrastructures and systems, and they promote excessive consumption of material, energy and natural resources (Wu, 2014). As much as cities are held responsible for the growth of sustainability crises, they are also acknowledged as the sites from which sustainability transformations can be leveraged (Wolfram, 2016; Nevens et al., 2013). Cities are complex, adaptive social-ecological systems in which ecological, technological, and social components are deeply interlinked and constantly co-evolving (Pickett et al., 2004; McPhearson et al., 2015). In line with this understanding, the sustainability transitions and transformations literature highlights

cities as places to implement pilots and experiments to thoroughly explore and learn the ways and challenges of facilitating real-world change (Torrens & von Wirth, 2021).

In this study, we conducted an urban experimentation in the Laajasalo neighbourhood of Helsinki City, exploring the use of design-based co-creation methods and methodologies in the planning sector. We adopted a transdisciplinary action research approach (Fazey et al., 2020; Lang et al., 2012) and implemented a series of co-creation workshops to catalyse systemic change by employing various methods and tools. The workshops facilitated different, yet complementary, approaches to thinking about and relating to urban sustainability transformations, including but not limited to systems thinking, futures thinking, and empathy-building. These workshops, with the variety of methods they showcased, allowed us to investigate further how methodological innovation in the planning sector can drive sustainability transformations in diverse ways.

Laajasalo is a low-density urban neighbourhood that has undergone a contested urbanisation process over the last decade. The neighbourhood has been subject to a new light-rail network (Kruunusillat) and the development of a new residential area (Kruunuvuorenranta), and has therefore undergone major construction, resulting in the depletion of urban nature. Urban development on Laajasalo generated severe conflicts between residents and the local government, particularly regarding how urban design and planning decisions often sideline the local community's wishes, the wellbeing of more-than-human entities and the integrity of urban nature (Härkönen, 2024). This misalignment between the local community and the planning authorities led to a loss of trust and hope in both parties.

Helsinki, and particularly the neighbourhood of Laajasalo, is a typical case of urban development led by an economic growth paradigm (Loikkanen, 2015). This study proposes that Helsinki's planning can benefit from a DfSTT approach and the utilisation of design-based co-creation methods and methodologies to drive positive urban change. Relating to Abson et al.'s (2017) conceptualisation of three realms for deep transformations (re-structure, re-connect and re-think), we identified three key areas for enabling sustainability transformations in Laajasalo:

- developing a holistic systems perspective on urban transformation processes (that highlights social-ecological system relationalities and more-than-human wellbeing),
- involving local communities in the processes of decision-making and place-shaping (which promotes inclusive and collaborative practices in planning),
- Targeting transformative co-learning at the individual and organisational levels.

We experimented with a range of design-based co-creation methods to delve into these three key areas. Between April and October 2024, we conducted seven co-creation workshops for the residents of the Laajasalo neighbourhood and the urban planners of the city of Helsinki. Methods and methodologies used in workshops addressed the **re-connect** realm of deep transformations by focusing on urban nature in Laajasalo and discussing topics ranging from urban social-ecological systems to nature-based solutions and more-than-human wellbeing. The workshops were closely related to the **re-structure** realm of deep transformations, as they demonstrated alternative methods and processes which can be integrated into urban planning and governance practices. Furthermore, the workshops engaged with the **re-think** realm by encouraging different ways of thinking/knowing.



Figure 1. The workshops proceeded in parallel for two stakeholder groups (residents and city planners) and ended with a joint workshop.

Selection of participants and participation turnout

This study emphasises the importance of developing context-sensitive knowledge on urban issues and bridging the everyday wisdom of local inhabitants with the expertise of urban planners. Thus, the workshops targeted facilitating co-learning among and between two major stakeholders of Laajasalo's urban transformations: (1) residents and (2) city planners (Figure 1). Both groups' participation was invitation-based and voluntary. However, city experts were invited from across departments and units for a fair representation of various roles and perspectives of the city organisation. In contrast, residents were invited based on random sampling (300 invitation letters were sent).

The turnout rate among residents was relatively low, with only 3% of the 300 invitations being accepted by ten people in total. However, the attendance was consistent, as almost all residents had registered for the entire series of workshops. Conversely, planners were selective in their attendance, as they reported choosing workshops that aligned with their professional tasks and interests. The decision to attend individual workshops rather than the complete series made a difference in the time and space available for deep reflection and transformative learning. Such selective participation by planners in workshops disrupted the longitudinal continuity of the process and probably limited participants' knowledge of workshop topics and methods, thus their ability to bridge them.

Data collection and analysis

Throughout the research project, we gathered data through several methods: (a) audio and visual documentation from the workshops, which included a total of 603 minutes of audio recordings and 301 photographs; (b) observations and ethnographic notes; (c) surveys to collect participants' feedback and opinions, with 7 responses received; and (d) follow-up semi-structured interviews with city experts and residents, comprising 14 interviews, each lasting approximately 1 hour.

We applied framework analysis to the data to assess how, and to what extent, applied methods and methodologies contributed to advancing sustainability transformations. As the analytical framework, we developed and utilised an enhanced Leverage Points framework (see Table 1).

Leverage points for systems change (Meadows, 1999)	Re-structure realm	Re-connect realm	Re-think realm	Levels of learning and change (Illeris, 2017)
	focuses on the role of institutions and institutional decline and failure in systemic change <i>(Socio-institutional system transformations)</i>	focuses on human-nature relations and their influence on sustainability outcomes <i>(Social-ecological system transformations)</i>	focuses on knowledge production and use in transformation processes <i>(Transformations of knowledge systems)</i>	
<i>Parameters</i>	Changes in the relatively mechanistic characteristics of a system (typically targeted by policy makers, e.g. increasing the number of services such as daycares, neighborhood parks, etc.)			<i>Cumulative learning Replication</i>
<i>Feedbacks</i>	Changes in the interactions between elements within a system for enhancing internal dynamics (e.g. allowing for residents' comments on urban plans, deriving planning decisions from an enhanced data set on local needs)			<i>Assimilative learning Additive improvement</i>
<i>Design</i>	Changes in the social structures and institutions that manage feedbacks and parameters (e.g. urban governance models, urban planning mechanisms)			<i>Accommodative learning Integrative change</i>
<i>Intent</i>	Changes in the underpinning values, goals, and worldviews of actors that shape the emergent direction to which a system is oriented. (e.g. shifting urban values and priorities towards multispecies wellbeing)			<i>Transformative learning Transformative change</i>

Table 1. The analytical framework for assessing the transformative potential of methodological innovation in the planning sector.

The Leverage Points framework, as proposed by Meadows (1999), is a conceptual tool for identifying strategic intervention points in complex systems where small changes can lead to significant transformations. It categorises these points from *shallow*, such as in adjusting parameters in energy use, to *deep*, such as shifting changing paradigms and mindsets. This hierarchy highlights that addressing deep, structural, and cognitive aspects is more impactful than making superficial changes. In sustainability transformations research, the framework has been influential as it encourages focusing on altering underlying beliefs and systemic goals, rather than just tweaking existing variables.

Our analytical framework is inspired by Davelaar's (2021) work of a heuristic composite model, which juxtaposed Meadows' (1999) Leverage Points framework with Abson et al.'s (2017) succeeding work on deep transformations, and Sterling's (2010) orders of change (incremental, transitional and transformational change). Given learning is a key catalyst and lever for transitional and transformational change (Van Mierlo and Beers, 2020), we find value in further exploring the juxtaposition of the Leverage Points framework with levels of learning. Hence, we juxtapose the Leverage Points framework with Illeris' (2009) four levels of learning - cumulative, assimilative, accommodative, and transformative. The Leverage Points Framework, with the integration of levels of learning, has become a useful lens for this study to trace the transformative potential of applied co-creation methods and methodologies for mobilising multifaceted changes in cities.

The case of Urban Nature Futures workshops: Experimenting with design-based co-creation methods and methodologies

Co-creation is a distinct mode of collaborative research and urban governance in which promises to advance urban sustainability transformations by weaving plural knowledges for place-based transitions, democratizing science and policymaking, empowering urban communities, and fostering new relationships, narratives, and solutions that can disrupt unsustainable patterns and generate actionable, transformative outcomes (Frantzeskaki et al., 2025). The Urban Nature Futures workshop series included seven co-creation workshops targeted to Laajasalo's residents

	Aims	Methods and activities	Ways of thinking /knowing	Expected outputs and outcomes
<i>Workshop 1&2</i> <i>Urban Nature Visions of Laajasalo</i>	Reflecting on the current social-ecological systems of Laajasalo and human-nature relations; envisioning alternative futures for Laajasalo that demonstrate strong and diverse nature values.	• seminar • social-ecological systems mapping • envisioning	systems; futures; relational;	• A social-ecological systems map of Laajasalo; • Speculative visions of Laajasalo's urban life and environment
<i>Workshop 3&4</i> <i>Multispecies Thinking</i>	Identifying the more-than-human species that cohabit Laajasalo, portraying their life in the city and potential interaction with the urban environment	• seminar • role taking • storytelling	empathetic; relational; multispecies	• A multispecies assembly conversation • Species' narratives
<i>Workshop 5&6</i> <i>Sensing futures and ecological selves</i>	Exploring the current relational dynamics in Laajasalo, and the desired future of stakeholder networks	• <i>presencing</i> • role taking • sculpturing • reflections	embodied; affective; relational	• Actor constellations of current Laajasalo and future Laajasalo
<i>Workshop 7</i> <i>Cocreating Transitions</i>	Identifying the series of actions that can lead transformations towards sustainable futures	• seminar • dialogue • dot-voting • transition pathway development	futures; strategic; systemic	• A timeline of transformative actions

Table 2. The workshops employed diverse but complementary methods to explore Laajasalo's urban transformations and future states

and the City of Helsinki planners. The workshops sought to ignite critical and creative thinking on social-ecological systems while aiming to develop systemic and strategic understandings of urban sustainability transformations. Throughout the workshops, participants engaged in a variety of co-creation methods and ways of thinking/knowing (see Table 2).

The workshop activities included envisioning speculative urban futures, mapping social-ecological systems, developing more-than-human narratives of everyday life, building stakeholder constellations through embodiment, and cocreating transition strategies and pathways. With such methodological plurality, the workshops aimed to unpack the complexities of Laajasalo's transformations from complementary angles and to contribute to the formation of shared understandings and futures.

The workshops were designed to engage participants in bilateral conversations and co-learning through social interaction and hands-on work. All participants were considered 'experts of their own worlds' and provided equal opportunities to contribute to the conversations and activities. The workshops sought to strike a balance between enabling participants' generative, open-ended input and steering the process towards the task without undue interference. The methods and tools were tailored to focus conversations on the given topic and to support collaborative work to meet workshop tasks and targets, using informative, visual, textual, and graphical probes (e.g., thematic pictures, future narratives, transition timeline board and cards).

Results: To what extent can methodological innovation leverage urban sustainability transformations?

Using the enhanced Leverage Points framework we developed (see Table 1), we analyse here the potential of applied co-creation methods and tools for leveraging comprehensive urban change across three realms: re-structure, re-connect, and re-think.

- restructuring: fostering cross-sectoral collaboration between residents and city experts and building hybrid urban governance and planning practices,
- reconnecting: reconfiguring urban systems with novel nature values and human-nature relationships, and

- re-thinking: co-producing urban strategies, and actions from a plurality of perspectives, and ways of thinking/knowing.

Re-structuring: leveraging socio-institutional system transformations

In this study, the re-structure realm of deep transformations refers to changes in the socio-institutional systems, processes and practices of urban planning. The workshops revealed several key insights into how urban planning can be practised and managed in novel ways to disrupt the incumbent regimes and actor hierarchies in urban decision-making (see Table 3).

Urban transformations require blending different domains of knowledge and action, particularly bridging the perspectives of high-level decision-makers and local communities. Planners are informed about urban development trajectories, strategic targets, critical social needs, and key criteria shaping land-use decisions; they present perspectives from the provision side of urban sustainability transformations. Local communities, on the other hand, have first-hand experience on the everyday urban life, and knowledge about emerging needs and expectations; they present perspectives from the demand side of urban sustainability transformations. Bridging the perspectives of planners and local communities is, hence, not only necessary for framing better decisions and actions, but also a must for understanding the complexity and wickedness of urban sustainability transformations. Urban Nature Futures workshops address, foremost, this need for bridging perspectives, and aim to facilitate co-learning between residents and planners and enable new systemic understandings to emerge.

Residents and planners both reported that the workshops provided opportunities for them to express their perspectives, listen to others, and collaboratively seek shared understandings. One resident mentioned that their "previous negative attitude towards urban decision-makers and authorities has shifted", and now that they have established understanding and trust. One other resident stated that, "on the contrary to their previous experiences of participatory planning which proceeded in rather conventional formats (i.e. seminars followed by Q&A sessions), they felt "being heard" and were able to "hear others" this time, as a consequence of given time and space for dialogue and "human connection". Similarly, one planner reported that utilised methods and tools

	Initial considerations and goal	Outcomes
	<i>With which considerations and goals were workshop methods and tools crafted?</i>	<i>How did the workshops support urban transformations?</i>
<i>Parameters:</i> <i>Improving the efficiency of urban decision-making and planning processes</i>	-The conditions were set to have resident-planner interaction in expanded time and in-person.	
<i>Feedback:</i> <i>Building and enhancing the interactions between urban actors and systems</i>	-Methods and tools were crafted to steer participants' conversations within a balance of control and flexibility.	-Participants reported the potential of applied workshops for facilitating constructive dialogue.
<i>Design:</i> <i>Shifting urban planning practices, local governance processes and mechanisms</i>	-Alternative planning practices and governance models that shift incumbent power structures across city units, across residents and planners.	-Planners expressed the application potential of some methods to facilitate collaborative work in their teams/units, across several units of the city, or with resident groups – suggesting a shift in practices of urban planning. -The residents expressed their demand for having such constructive methods to build dialogue and collaboration among local communities or between city and residents.
<i>Intent:</i> <i>Values and goals for socio-institutional change</i>	-Facilitate co-learning and mutual understanding among participants' plurality of perspectives, and co-production of new ideas and urban decisions	-Participants expressed trust across sectors of residents and planners, in addition empathy for the different stakeholders of urban planning. -Both the residents and planners found the discussions on nature values, urban futures and strategies constructive and insightful.

Table 3. The table analyses the potential of applied workshops for leveraging the re-structure realm of urban transformations – urban governance and planning practice.



Figure 2. Photos from Urban Nature Visions of Laajasalo workshops. Source: Authors.

generated constructive conversations rather than disputes among urban stakeholders, and that they would be willing to utilise these methods again in the future. Another planner compared the workshops with the regular participatory planning events of the City of Helsinki and reflected on how the workshops enabled hearing residents' perspectives and unpacking the "root reasons" behind residents' wishes and needs.

The results collectively suggest that applied design methods were able to prefigure an alternative urban governance model and planning practice – one that follows less hierarchical, and more collaborative processes of knowledge production and decision-making.

Re-connecting: leveraging social-ecological system transformations

In the re-connect realm of deep transformations, this study explores shifting human-nature relationships in urban contexts, tackling cultural and intrinsic nature

values, the roles of urban nature in cities, and multispecies wellbeing (see Table 4). For example, the Multispecies Thinking workshop introduced empathy and storytelling as ways to relate to more-than-human beings. In this workshop, participants drew narratives of how the city's animate and inanimate natural stakeholders (ranging from fungi and bacteria to trees, birds and sea ecosystems) pursue their lives in Laajasalo, and how their needs and wishes can be incorporated in urban planning. The workshop was playful, encouraging simplified terminology and inclusive language (Figure 3).

Participants' comments on this workshop and their experiences varied. While some participants criticised the assumptive approach of role-playing and storytelling, others found the playful approach of these workshops beneficial for enabling low-threshold communication and learning across different departments of the city organisation. The critical feedback addressed the workshop's limitations in its use of facts and scientific knowledge, and thus in generating learning in urban ecology and animal studies. The positive feedback highlighted the workshops' terminology-free language, which enabled inclusive communication among disciplinary experts and non-experts. Participants' varied views on this workshop underscores the challenge of integrating grounded data and high-level scientific knowledge in exercises that primarily aim at fostering empathy, playfulness and creativity towards multispecies life within a limited timeframe. The variety in how this workshop was taken by participants also highlights the challenge of managing the diverse expectations of participants and the importance of crafting learning experiences and dialogues that resonate with a spectrum of knowledge levels.

In this study, we deliberately chose to engage with empathy-building and storytelling, than relying majorly on scientific facts, in order to spark creativity and new insights. However, this methodological choice resulted in important trade-offs. While some participants valued the creative, inclusive approach, others pointed out that it sometimes came at the expense of integrating factual and scientific knowledge. This raises questions about how to foster creativity without compromising the rigor of scientific inquiry, and whether such trade-offs are inherent or can be addressed through novel methods.

	Initial considerations and goal	Outcomes
	<i>With which considerations and goals were workshop methods and tools crafted?</i>	<i>How did the workshops support urban transformations?</i>
<i>Parameters:</i> <i>Increasing nature stock</i>	-The workshops focused on urban nature and the revitalisation of green spaces in Laajasalo. -Workshop tools, such as in the picture cards, highlighted nature and various locations where urban nature exists.	-Residents articulated a desire for an increase in meadows, expanded forest trails, and enhanced urban furniture designed to promote nature sports and facilitate outdoor gatherings. -Urban planners communicated forthcoming regulations and actions concerning green infrastructure.
<i>Feedback:</i> <i>Interrelating ecological systems and functions with social systems and the built environment</i>	-Discussions were built around nature-based solutions and ecosystem services, particularly during the activities of social-ecological systems mapping. - Workshops suggested more-than-human beings of Laajasalo as equivalent stakeholders of urban transformations and as crucial actors in social-ecological systems.	-Residents advocated for the integration of environmentally friendly and sustainable features in new residential developments. -Residents commended the benefits of engaging in daycare activities within forest settings and suggested that similar nature interactions be facilitated for school children and young adults. -Both residents and planners identified the sea as a significant component and stakeholder within the neighbourhood.
<i>Design:</i> <i>Reconfiguring urban social-ecological systems</i>	-The workshop activities were targeted at envisioning urban futures with a focus on social-ecological systems and their transformations - Workshops included activities to support multispecies thinking and ecological sensitivity, such as listing more-than-human beings in Laajasalo, identifying their interactions and needs.	-The visioning activity provoked discussions on the multiple ways that social-ecological systems can be designed. This activity revealed how shifts in design values, principles and decisions might completely change how societal sectors relate and work (such as the economy and business). -Residents came up with novel ideas for enhancing social-ecological systems of Helsinki and Laajasalo, and these ideas demonstrated multi-actor and multi-scalar thinking.
<i>Intent:</i> <i>Aiming at diverse nature values, cultures and ethics</i>	-Challenging human-centric perspectives; introducing novel nature values -Workshops introduced multispecies perspectives and relational lenses.	-Residents developed ideas around taking active roles as local communities in maintaining and caring for local nature. This suggested building nature stewardship.

Table 4. The table analyses the potential of applied workshops for leveraging the re-connect realm of urban transformations – human-nature relationships and social-ecological systems.



Figure 3. Photos from the workshop Multispecies Thinking. Source: Authors.

The Urban Nature Visions of Laajasalo workshop also aimed to leverage the re-connect realm of urban transformations, by challenging the human-centric values of urban nature, which place nature as a resource for human wellbeing and as a backdrop for human activity. Throughout the workshop, participants tackled urban human-nature relationships and explored alternative urban futures which embed ecological considerations alongside societal needs. The workshop introduced participants to the Nature Futures Framework (NFF; Pereira et al, 2020; Kim et al., 2021) and relevant illustrative future narratives (Durán et al., 2023). In reference to nature values and given future narratives, participants, then, collaboratively envisioned the futures of Laajasalo. Some residents reported that engaging with diverse nature values significantly enhanced their perception of the complexities of urban systems. They found the vocabulary, concepts, and frameworks introduced in the workshops useful for discussing and evaluating planning decisions. However, some other residents expressed

the challenges of making sense of given future narratives and recontextualising them for Laajasalo's sustainability transformations.

Re-thinking: leveraging knowledge system transformations

The re-think realm relates to both the re-structure and re-connect realms of deep transformations in this study and underpins the necessity to integrate different modes of thinking and knowing, i.e. systems, futures, multispecies, empathetic and embodied thinking) to plan for urban sustainability transformations (see Table 5).

The workshop series sought to reframe urban planning as a dynamic and collaborative practice of knowledge production, and introduced a spectrum of conceptual tools and exercises to rethink urban systems and transformations. The final workshop, titled *Cocreating Transitions*, hosted discussions about the intent behind urban planning and its implications for planetary wellbeing (Figure 4). Questions and concerns were raised regarding Helsinki's growth-oriented planning strategies. Although deep-level transformations, such as mindset changes and paradigm shifts, were limitedly suggested in the data, participants' reflections indicated that applied workshops enabled them to build systemic awareness in the context of urban planning and to generate critical insights into the futures of Laajasalo's urban transformations.

Furthermore, throughout the workshops, participants engaged with urban planning beyond problem-solving and strategy development, and explored urban planning across the continuums of cognitive, emotional, and embodied knowledge production. Proposing a range of methods and welcoming plural ways of thinking/knowing, the workshops intended to expand the systems and complexity framings of urban issues. For example, participants explored the relational dynamics across social, ecological and technical urban systems, while empathetic methods such as role-playing encouraged them to consider multispecies perspectives and redefine stakeholders and stakeholder needs. Applied methods and a series of workshops suggested urban planning is a collaborative endeavour that includes emotional intelligence alongside strategic foresight. With such a multidimensional approach, we aimed to contribute to the re-think realm, planting disruptive seeds (Rutting et al., 2022) to shift perspectives and transcend paradigms.

	Initial considerations and goal	Outcomes
	<i>With which considerations and goals were workshop methods and tools crafted?</i>	<i>How did the workshops support urban transformations?</i>
<i>Parameters:</i> <i>Increasing current understanding of Laajasalo's planning challenges</i>	-The overall aim of workshops was to expand participants' understanding of multiple factors and scales of urban transformations.	-Residents expressed an expanded understanding of the key system connections and future objectives that the city of Helsinki prioritises in urban planning. Similarly, planners noted increased awareness of residents' needs and desires.
<i>Feedback:</i> <i>Enhancing the actors' interaction in planning practice</i>	-Applied methods enabled strategic and future-oriented discussions and thus suggested a shift in the timing and scope of resident-planner interaction from consultation to collaboration.	-Both residents and planners compared their experiences in the workshops with previous interactions and expressed satisfaction with how the workshops facilitated constructive dialogue and fostered connections.
<i>Design:</i> <i>Reconfiguring the knowledge production and decision-making processes in the planning sector</i>	-We used collaborative methods to facilitate co-learning among different stakeholders and perspectives	-The workshop setting, methods, and tools empowered participants to articulate their perspectives and actively listen to others, promoting mutual understanding and co-learning.
<i>Intent:</i> <i>Aiming at diversifying planning paradigms</i>	-The workshops engaged participants in multiple ways of thinking/knowing and hence critically addressed that planning should explore novel paradigms and values to guide planning strategies and decisions.	-Residents developed a critical perspective on the prevailing growth-oriented paradigm driving urban planning decisions and advocated for the inclusion of objectives like ecological sustainability and long-term well-being. Planners found value in employing methods facilitating embodied knowing and multispecies thinking to rethink urban complexities and tensions.

Table 5. The table analyses the potential of applied workshops for leveraging the re-think realm of urban transformations – knowledge systems.



Figure 4. Photos from the workshop Cocreating Transitions. Source: Authors.

Discussion: The promises and challenges of methodological innovation in facilitating urban sustainability transformations

The results bring several interrelated themes into light: urban planning as a boundary practice, trust and co-learning, capacity building, and the shifting roles of cities and planning authorities. Together, the findings point to methods and methodologies as essential leverage points for advancing sustainability transformations in urban planning.

Urban planning as a boundary practice

Urban planning and design act as a boundary practice among the city's multiple stakeholders. People are highly interested in how their future urban environment, as it changes, will affect their lives, livelihoods, health, and wellbeing. Applied cocreation methods, motivating interaction across stakeholders, enabled doing boundary-spanning

work and converging the different worlds of participants in dialogue. In urban sustainability transformations, such boundary-spanning work is crucial for unpacking stakeholder perspectives, bridging ideas, developing integrated strategies and aligning multiple efforts towards sustainability targets (Franco-Torres et al., 2020). Urban planning provides an effective entry point for engaging with multiple stakeholders of sustainability transformations and converge on ideas for favorable futures. As such, urban planning processes can be reframed as opportunities to develop context-sensitive, multi-scalar, multilevel, multi-actor, and multispecies appreciations of urban transformations.

Capacity building for urban sustainability transformations

Urban Nature Futures workshops emerged as a capacity-building endeavour throughout its implementation, as activities facilitated learning at individual and collective levels. Throughout the workshop activities, participants engaged in different ways of thinking/knowing on urban transformations, and thus they built cognitive, practical and affective skills. Applied design methods contributed to the formation of several notable capacities for Laajasalo's and Helsinki's urban transformations:

- expanding the complexity framing of urban sustainability transformations,
- Disseminating design perspectives, building co-creation skills and competences for transformations,
- prefiguring alternative practices of urban planning,
- building multistakeholder networks and organisational cultures of collaboration.

Capacity building is the groundwork for urban sustainability transitions and transformations and enables the distribution of leadership for change to society. When designers step out of their leader and expert roles and become enablers, facilitators, co-learners, and co-creators of transformations, an opportunity emerges to accelerate urban change through shared responsibility and leadership from all parts of our societies. Applied design methods and methodologies served to the formation of collaborative and integrative cultures and environments, building relational capital, trust and hope for Laajasalo's urban transformations.

Trust and co-learning

A key insight from the workshops was the importance of trust as both a precondition and outcome of collaborative urban transformation. Conversations on Laajasalo's urban transformations facilitated mutual understanding between planners and residents, enabling a shift from positional to relational modes of interaction (Healey, 2017). In this sense, trust was transformative: it supported creating a safe space where future needs and expectations could be expressed, envisioned and negotiated. Workshops demonstrated that urban transformations will not be the product of consensus but of negotiated agreement among diverse stakeholder perspectives and among divergent ways of knowing and multispecies needs.

The shifting roles of cities and planning authorities

Transformations are long-term, deeply rooted changes in values, structures, and patterns. Their emergence is difficult to trace over a short timescale, particularly given the limited number of workshops. The seeds of transformation may be planted through design-based co-creation processes, but their fruition requires institutional support, further engagement, and continuous learning. This research provides a glimpse into how transformations might be infrastructured (Karasti, 2014) by the city organisations, by establishing cultures of collaboration, critical thinking, co-learning, and integration. From this point of view, methods and methodologies are essential for urban sustainability transitions and transformations, not only for their practice-oriented outcomes but also for their potential to trigger impactful leverage points for deepening and widening systemic change.

Taken together, the results address a need for shifting the roles of local governments and planning authorities towards transformation network leaders (Strasser et al., 2019), primarily through capacity building. Our findings confirm that design-based co-creation methods and DfSTT approach are relevant and impactful entry points for the cities to take on such leadership roles.

Challenges of methodological innovation in the planning sector

Despite the promising insights, this research is not without challenges or limitations. First, the findings are based on a relatively small group of participants, which may limit the representativeness of the identified themes. Second, the process was strongly

facilitated by the researchers, which may have shaped the dynamics and reliability of the study. Third, the case was situated in the Finnish context, where the traditions of democracy and institutional trust are comparatively strong. These features likely influenced both the willingness of participants to engage and the overall effectiveness of the experiment.

Furthermore, there were notable differences in the participation practices and attitudes of participants. One significant difference was in how the residents and planners engaged in design visioning. Planners' professional competence in strategic thinking and collaboration contrasted with residents' novice-level skills. Planners, in general, participated more confidently in hands-on activities such as mapping, drawing diagrams, and taking notes, whereas residents were often comfortable with building dialogues, asking questions and expressing their ideas, but hesitated to use design tools.

For example, during the first visioning workshops (Urban Nature Visions of Laajasalo), residents were challenged by illustrative future narratives. The illustrative future narratives provided descriptions of future societies and societal systems shaped by alternative nature values that move beyond instrumentalisation (Duràn et al., 2023, Pereira et al., 2020). These narratives were meant to provoke thinking on how value-laden urban planning is and how value systems shape cities and urban life, and to be used as a reference and source of inspiration to imagine the nature-based transformations Laajasalo could undergo by 2060.

Planners approached the task smoothly, drawing on their familiarity with futures thinking and strategic planning; they used the illustrative scenarios as a starting point to envision the urban state of Laajasalo in 2060. However, the residents struggled to relate to the illustrative scenarios. Some even found these scenarios "alienating for their context-free and rather abstract narrative, which had no references to Laajasalo's spatial, cultural and natural assets". Consequently, the residents deviated from the task of envisioning alternative futures for Laajasalo. Instead of reflecting on the radically different futures Laajasalo could evolve into, they tackled current neighbourhood needs and identified local assets which can inform urban planning decisions.

These differences in participation practices and attitudes demonstrate that planners and residents were perhaps imbalanced in their ability to collaborate equally in thinking about and planning for urban sustainability, even though the workshop methods and tools were carefully crafted to enable inclusive collaboration. These differences, furthermore, highlight the need to develop literacy for futures thinking, design thinking, strategic planning, and collaboration. Equipping societies with such skills is necessary not only for establishing a cross-sectoral collaboration culture in urban planning and an urban governance model that embraces community involvement and bottom-up steering, but also for enabling societies to imagine, plan, and implement novel transformations. Applied co-creation methods and methodologies seem useful for building relevant skills in participants, as we observed improved engagement among residents in subsequent workshops, likely due to the skills they developed and the familiarity they gained with futures thinking.

Conclusions

This paper explored how, and to what extent, methodological innovation in the planning sector can leverage urban sustainability transformations through a case study. We introduced an urban experimentation that prefigures how urban planning can move beyond conventional, hierarchical decision-making towards dynamic, nonlinear, and integrated processes of knowledge co-production. We experimented with a range of design-based co-creation methods that aim to ignite collaborative and strategic thinking, creativity, empathy and co-learning to reframe urban sustainability transformations.

The study does not directly demonstrate the transformation outcomes of co-creation workshops, but identifies methodological conditions that may support transformations and proposes several implications for the urban planning practice. Integrating different modes of thinking/knowing into the urban planning practice through novel methods and methodologies can advance urban sustainability transformations, by re-orienting social-ecological and socio-institutional systems trajectories, and by reorganising systems of knowledge production. Open dialogue and mutual trust emerge as essential conditions for cross-sectoral collaboration and collective action for sustainability transformations. Based on our findings, we suggest a shift in urban planning processes

and practices, and more so in the roles of local governments and planning authorities towards transformation network leaders. Furthermore, we suggest another shift in the dominant urban planning paradigm towards one that highlights place-based sustainability by deeply considering how social-ecological systems can thrive and multiple species can mutually flourish in urban contexts.

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