

Circular Commons

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DOI

[10.1007/s43615-024-00473-4](https://doi.org/10.1007/s43615-024-00473-4)

Publication date

2024

Document Version

Final published version

Published in

Circular Economy and Sustainability

Citation (APA)

Egger, T., van Dorst, M., Ioannou, O., & den Heijer, A. (2024). Circular Commons: Exploring Innate Spatial Tactics as Pathways toward a Circular Built Environment. *Circular Economy and Sustainability*, 5(2), 1157-1199. <https://doi.org/10.1007/s43615-024-00473-4>

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Circular Commons: Exploring Innate Spatial Tactics as Pathways toward a Circular Built Environment

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Received: 9 June 2024 / Accepted: 28 October 2024
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Abstract

The built environment significantly contributes to current socioenvironmental crises, necessitating systemic change. Circularity and the commons are re-emerging as potential pathways for such transition. A circular built environment (CBE) aims to close resource loops, but its implementation is often slow and neglects social and local aspects. The commons framework emphasizes local involvement and sustainable self-management of shared resources. However, the intersection of circularity and the commons in spatial production is underexplored. This paper explores their relationship as “innate spatial tactics,” referring to the ways ordinary people interact with the built environment to meet their daily needs. Through a literature review, we developed a conceptual framework of “circular commoning,” encompassing three dimensions: resources, people, and governance. We applied this framework to analyze 16 empirical examples of circular commoning in contemporary urban settings. Our research shows that circularity and the commons are closely linked and mutually beneficial. Circular commoning involves diverse resources, changing social roles, and innovative governance. We identified three forms of circular commoning as innate spatial tactics: building circular, circular use of space, and creating spaces for circular activities. The framework developed here provides a basis for further action research. The practice review demonstrates that circular commoning is not only a distant utopian ideal but is enacted daily in diverse urban contexts. Such often-overlooked innate spatial tactics can offer valuable lessons for pathways toward a CBE involving principles of a circular society. Additionally, they can help shape new narratives and channel hope for practical progress towards circular futures.

Keywords Circular Built Environment · Urban Commons · Innate Spatial Tactics · Circular Society · Community Economies

Introduction

The concept of *circularity* is experiencing a resurgence in policy and academic spheres as a sustainable alternative to the prevailing take-make-waste paradigms in the production of the built environment. This revival draws on longstanding concepts such as cradle-to-cradle, biomimicry, and industrial ecology. A circular economy is a regenerative system that reduces resource use, waste, emissions, and energy loss by slowing, closing, and narrowing resource loops [1]. In the face of current socioecological crises, circular models propose a systemic change from linear take-make-waste models by rethinking entire chains of production, consumption, distribution, and recovery of resources [2, 3]. This involves strategies such as long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling [1]. Today, the built environment is a significant contributor to environmental degradation and social inequity, making it a primary focus for urgent changes (e.g. [4, 5, 6]).

Over the last “millennia of progressive separation”, the production of the built environment has undergone progressive fragmentation and professionalization [7]. Tendencies such as mass industrialization, modernist development, car-centric planning, and money-oriented urban development have led to the loss of innate knowledge that once enabled people to build environments that served community needs while respecting environmental boundaries [8]. Linear “take-make-waste” approaches to spatial production involve fragmented stages—extraction, production, construction, usage, maintenance, and disposal—often isolated in professional silos and distributed globally. The built environment accounts for over 50% of global raw material extraction, 40% of energy-related CO₂ emissions, and one-third of all waste in the EU [4, 5]. Socially, workers at both ends of these resource chains—such as in extraction, processing, demolition, recycling, and waste treatment—are often undervalued and marginalized. Low-income communities, in particular, face unsafe working conditions, environmental degradation, and violations of community rights [9–12].

To rethink linear spatial production, TU Delft’s CBE Hub describes a *circular built environment* (CBE) as a system designed for closing resource loops at different spatial-temporal levels by transitioning cultural, environmental, economic, and social values toward a sustainable way of living, enabling society to live within planetary boundaries [13]. Recent global disruptions, such as the COVID-19 pandemic, the Ukraine War, and the deepening climate emergency, have had adverse impacts on the construction sector, leading to shortages of construction materials and skilled labor [14, 15]. This collapse of business-as-usual may serve as a wake-up call for radical change in spatial production, with movements such as *Bauwende*¹ in Germany calling for radical change in the construction sector [16–18]—but also in the everyday use of the built environment.

Significant policy measures, such as the *EU Circular Economy Action Plan*, reflect strong commitment and ambitious goals in transitioning toward circular futures [19]. Nevertheless, the translation of theoretical circular models into practice and tangible outcomes remains limited [20–22]. Global circularity rates have even declined in the last five years, with practical applications often reduced to less impactful strategies such as recycling without addressing the core issues of reducing consumption and rethinking use [23]. Within the built environment, tangible examples of circular cities, neighborhoods, or buildings remain

¹ “Bauwende” (German) translates to “building transition.” It refers to a fundamental shift or transformation in the building and construction industry toward more sustainable, environmentally friendly, and resource-efficient practices.

limited to a handful of visionary pilot projects. Circular transition in spatial production remains challenging, and progress is slow [24].

Here, we explore three reasons for the slow progress in transitioning to a CBE. First, contemporary construction is highly professionalized and globalized, with complex resource supply chains (e.g. [25, 26]). The built environment rarely emerges from local labor, knowledge of what is really needed, or local materials. People are often passive users of these environments, unaware of where materials come from and without much of a say on how spaces are used. Research attributes the slow pace of change in the construction sector to its adherence to established institutional frameworks, social roles, and practices [27]. Second, circular models are criticized for ignoring sociocultural aspects and necessary paradigm changes in everyday life, human well-being, local community development, and inclusive growth [28–30]. Instead, they perpetuate eco-modernist norms and capitalist growth narratives through “green growth,” prioritizing technological solutions and top-down changes over more fundamental societal shifts [22, 31, 32]. More radical reforms in social norms, values, and power dynamics are often neglected, including aspects of reducing consumption, localizing, and simplifying lifestyles [3, 33–36]. Third, critical research points out the Western focus of circular models, overlooking the diversity of contexts, existing indigenous and historical knowledge, and perspectives from informal sectors and the Global South [36–38]. Consequently, circular models limit their transformative potential and may reinforce capitalist exploitation and exacerbate global inequalities [28, 39–41].

Recently, emerging *circular society* concepts have discussed circular transition as a more profound socioecological transformation, addressing crucial ecological, social, and political implications. e.g [42]. These concepts respond to calls for socially just transition that enhances human liberties while reducing the burden on the planet [43]. As Hobson writes, “circular transition is not just a business and policy endeavor but a thoroughly civic one” [34]. This alternative framing posits that a truly sustainable circular economy necessitates the foundation of a circular society reliant on the engagement of societal actors [44]. Circular society visions challenge dominant capitalist growth narratives, promoting environmental and social sustainability, justice, and a sense of community and solidarity. Drawing on daily social practices and integrating insights from degrowth and non-Western approaches to sustainability, circular society concepts aim to craft narratives that diverge significantly from traditional economic models [34, 36, 45–47]. Circular society concepts emphasize closing small everyday loops, such as urban restaurants growing food locally, composting leftovers, and using biogas for cooking [34]. Such simple approaches from everyday life tend to be overlooked in mainstream circular economy discourse [48]. Barford et al. [49] emphasize that while partnerships between the private sector, social enterprises, and NGOs are essential for advancing social justice and circularity, they often perpetuate existing power imbalances and biases. Although social issues receive limited attention in the literature, numerous small, locally rooted organizations are working towards a socially restorative circular economy. However, the benefits of these efforts often lack state support, and remain patchy. Circular society is an umbrella term and an open academic debate for more sustainable, inclusive, socially just, and democratic circularity discourses and practices [42]. However, Jaeger-Erben [44] points out that circular society concepts are still in their infancy and predominantly theoretical. There is a call to translate theoretical concepts such as CBE and a circular society into actionable practices [24, 44]. Around the world, numerous small-scale initiatives bring alternatives to practice that foster optimism that change is

achievable [34]. Within such practices, complex relations become locally grounded in the sense of “think global– act local.”

The commons offer a theoretical framework that emphasizes local involvement and provides a lens to explore how people sustainably self-manage their shared resources [50]. Ostrom [51] describes the commons as systems of resources shared by a community, necessitating collective management to prevent overuse, ensure sustainability, and promote fairness. The verb *commoning* describes the social processes that create and sustain the commons through community governance [52]. Commoning processes balance human needs and planetary boundaries, recognizing that individual well-being is tied to community and environmental health [53, 54]. Commoning processes balance human needs and planetary boundaries, recognizing that individual well-being is tied to community and environmental health [53, 54]. Currently, the resurgence of the commons and commoning is discussed in the context of the struggle for local participation within neoliberal realities. For Gutwirth et al. [55], this revival is not a sentimental desire to return to indigenous or customary traditions but could be essential in creating desirable futures. Avermaete [56] explores *urban commons*: the role of the built environment in the process of commoning and suggests that urban spaces are contemporary society’s most crucial commons.

Facing current socioecological crises, both circularity and the commons are resurfacing in academic and political discourse as pathways for thinking about alternative futures rather than sentimental returns to a perceived “golden age” [57]. However, the two concepts have not been studied in relation to each other, particularly not in the context of the built environment. We embarked on this research speculating that circularity and commoning are closely related as *innate spatial tactics* for managing shared resources in spatial production. De Certeau describes *spatial tactics* as the improvised daily activities through which ordinary people appropriate and interact with spaces to meet their daily needs, in contrast to *spatial strategies*, which are calculated actions of institutions to control space and behavior [58]. Here, we discuss *innate spatial tactics* to emphasize that ordinary people have engaged in intuitive, unplanned, self-organized utilization of space throughout history and continue to do so in modern urban contexts. These tactics emerge from everyday needs, lived experiences, and cultural norms but also desires to live differently - encompassing what is described as everyday, ordinary, quotidian, habitual, informal, bottom-up, vernacular, or Indigenous practices. We deliberately avoid labeling practices as “formal or informal”; as such, polarizing categories are often imposed by spatial strategies to reinforce existing power structures, while further marginalizing those labeled as “informal” [59, 60]. Instead, we view “innate spatial tactics” as an integral part of cities, intertwined with spatial strategies. Some authors emphasize that tactics such as sharing, reciprocity, reuse, and communal resource networks have been essential to communities throughout history [3, 61–63]. Both commoning and circular practices aim to avoid waste and use resources as efficiently and sustainably as possible [53]. However, there is limited literature investigating the relation between circularity and commoning as innate tactics for managing shared resources. Therefore, this paper examines the combination of theoretical frameworks of circularity and the commons in the production of the built environment.

We suggest that innate spatial tactics involving circularity and commoning in contemporary urban contexts can offer valuable lessons for a broader transition toward a CBE. Ostrom emphasizes the importance of experimenting with and learning from alternative resource management models. She stresses the need for empirical research and experimen-

tal methods to uncover how communities effectively manage shared resources, considering the uniqueness of each context and the limitations of universal solutions [51]. This study aims to review literature and practical examples to explore the relationship between circularity and commoning as innate spatial tactics to derive lessons for a broader transition toward a CBE. Since most of the world's population and resources are concentrated in cities and urban space might be the most important contemporary commons, we review examples from contemporary urban contexts. Through a literature review, we developed a conceptual framework for *circular commoning* as innate spatial tactics. We then selected and reviewed empirical examples of circular commoning practices in urban contexts and tested the conceptual framework. The outcome of this review is a conceptual framework and an inventory of empirical examples of circular commoning as innate spatial tactics, providing a basis for deeper analysis in further studies.

This research explores the built environment over time, encompassing stages such as design, construction, use, and adaptation, and spanning scales from materials to entire cities. It adopts a transdisciplinary approach, integrating insights from architecture, urban studies, and urban governance, focusing on the lifecycle of the built environment beyond the design phase, with particular attention to the extended use phase, which lasts significantly longer than typical consumer products. This article examines the role of the built environment in circular commoning, aiming to extract lessons for a broader transition to a CBE. The key proposition is that the built environment plays a dual role in circular transition: it can facilitate circular transition by providing ping spaces for r-strategies, and it must itself become more circular in its construction and operation, given its current significant contribution to waste and pollution.

Learnings from empirical examples have the potential to forge more nuanced visions of a CBE that combine the three pillars of sustainability: environmental, social, and economic. This research aims not only to contribute to broader CBE and circular society concepts but also to support narratives that create a sense of hope that change is achievable. Scholars often highlight the difficulties in translating abstract global challenges such as climate change into actionable everyday practices (e.g. [64]). Visions such as a CBE can appear as hard-to-reach utopian futures, daunting to ordinary people. In that sense, small-scale initiatives emerge as beacons of “radical hope,” showcasing practical steps not out of naïveté but as proactive resistance to dominant systems [65–67]. Echoing Hobson [34], our study aims to present a CBE as a relatable reality in the here and now through “small circular stories.” Furthermore, this review aims to shed light on and learn from these stories. As Habermann [68] emphasized, we need new experiences during which we change and with which we can gain new insights.

Methods

In this study, we reviewed theory and practice to explore the relationship between circularity and commoning as innate spatial tactics in contemporary urban contexts. We divided the review into two parts (see Fig. 1). In the first part, we reviewed literature from three fields: community economies, circularity, and the commons. The theory of community economies served as a lens through which to identify commonalities and mutual complementarities between theories of circularity and commoning in spatial production. From this literature

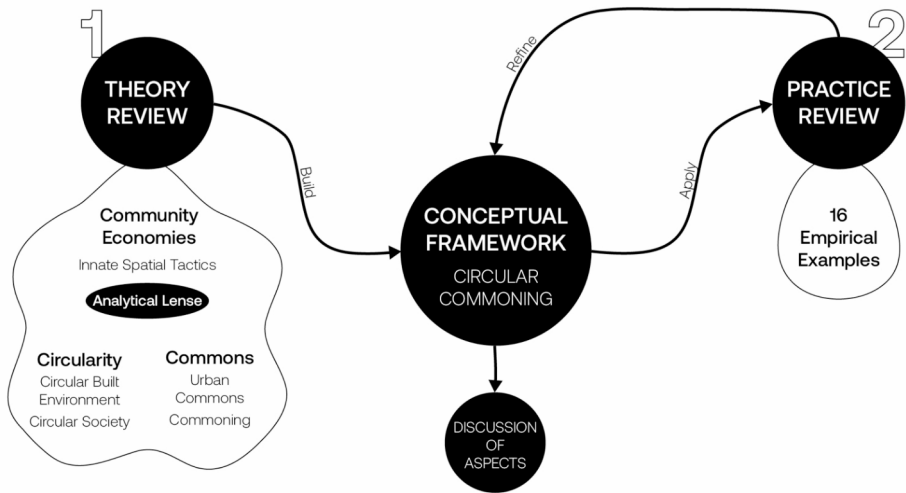


Fig. 1 Two-step methodology: the literature and practice review process for developing a conceptual framework on circular commoning as spatial tactics

review, we built a conceptual framework for circular commoning as innate spatial tactics. In the second part, we conducted a practice review. By applying the conceptual framework, we identified empirical examples of circular commoning in various urban contexts. We then reviewed accessible data of 16 selected examples through desk research. This analysis of practical examples helped refine the conceptual framework. During the final discussion, we integrated the reviewed theories and practices to reflect on aspects of circular commoning as innate spatial tactics. The proposed conceptual framework and inventory of empirical examples serve as a foundation for future action research, which can extract lessons from case studies and further bridge the gap between theory and practice.

Theoretical Underpinnings of Circular Commoning as Innate Spatial Tactics

This section combines theories from multiple disciplines to discuss the state of the art, research gaps, and intersections across three fields: community economies, circularity, and the commons. The theoretical underpinning comprised an exploratory search of books, journal articles, and grey literature in the fields of architecture, urban studies, social sciences, and sustainability studies. This process informed a four-part theoretical framework. The first part discusses community economies as a lens to identify often overlooked “innate spatial tactics” within the built environment, using search terms like “community economy,” “diverse economies,” and “everyday urban practices.” The second part examines circularity, particularly its social dimensions and their connection to the built environment, using keywords like “circular society” and “circular built environment.” The third part focuses on the commons, emphasizing urban commons and circular resource management, using search terms such as “urban commons” and “housing commons.” The last part identifies

overlaps between circularity and commons as spatial tactics, revealing cross-field insights that informed the development of a “circular commoning” conceptual framework.

Innate Spatial Tactics

The “diverse economies iceberg” framework [69] depicts activities associated with the capitalist economy above the waterline and a rich multitude of practices “other to capitalist” revealed below the waterline—a complexity of everyday economic, social, and ecological activities [70, 71]. Gritzas [72] describes the lower part of the iceberg as a hidden “never-land” of diverse practices. These include day-to-day activities such as unpaid household labor, consumer cooperatives, community-supported agriculture, local currencies, non-profit enterprises, squatter movements, slum dwelling, and co-housing [73]. Community economy theories challenge binaries of mainstream and “otherness,” instead talking about “economic diversity,” where practices below the waterline are not marginalized “leftovers” but essential components of complex realities. Lekan et al. [74] highlight what is considered alternative for some may be mainstream for others Fig. 2.

The built environment is closely linked to numerous everyday activities. De Certeau [58] differentiates between spatial strategies (organized methods of the powerful and institutions) and spatial tactics (improvisational actions by ordinary people) for organizing and planning urban spaces. Tactics are in the lower part of the iceberg and often diverge from conventions prescribed by strategies. Cities blend these concepts: official plans (strategies) converge with the ways people appropriate space (tactics), such as creating paths and narratives as they move through the city [58]. In urban contexts, the lower part of the iceberg is often described as “informalities,” referring to complex processes that occur outside standard regulations [75]. We avoid the “formal-informal” dichotomy, which is imposed by powerful entities and often exacerbates the marginalization of “informal” sectors by excluding them from resources, services, and decision-making processes [59, 60]. Roy critiques the tendency to view “informality” as separate from formality, suggesting instead that we see “informality as a mode of urbanization” with its own systems of rules and norms, consisting of the complexity of processes that intertwine diverse economies and urban spaces [76].

We echo this perspective with the term “innate spatial tactics” as longstanding everyday practices through which ordinary people engage with their built environments. Historically and in present-day urban contexts, these practices span time and are part of day-to-day life. For example, worldwide, many people resort to self-building to create a home. Scholars such as Rudofsky [77] and Turner [78] discuss these tactics and the wealth of knowledge they developed through trial and error. These tactics often align community needs with environmental boundaries. Importantly, spatial tactics extend far beyond the act of construction; they encompass how ordinary people maintain and interact with their built environments in their daily lives over extended periods. In contrast, spatial strategies are often confined to specific phases, such as design or planning. However, it is important to acknowledge that spatial tactics inherently struggle with power imbalances—as Certeau states, “a tactic is an art of the weak” [58].

The significance of innate spatial tactics for broader societal transformation depends on perspective. Lee [79] suggests practices under the water level can either be dismissed as insignificant “leftovers” of the mainstream economy or viewed as additional spaces of possibilities to cause a change in the mainstream, thereby offering spaces for transformation

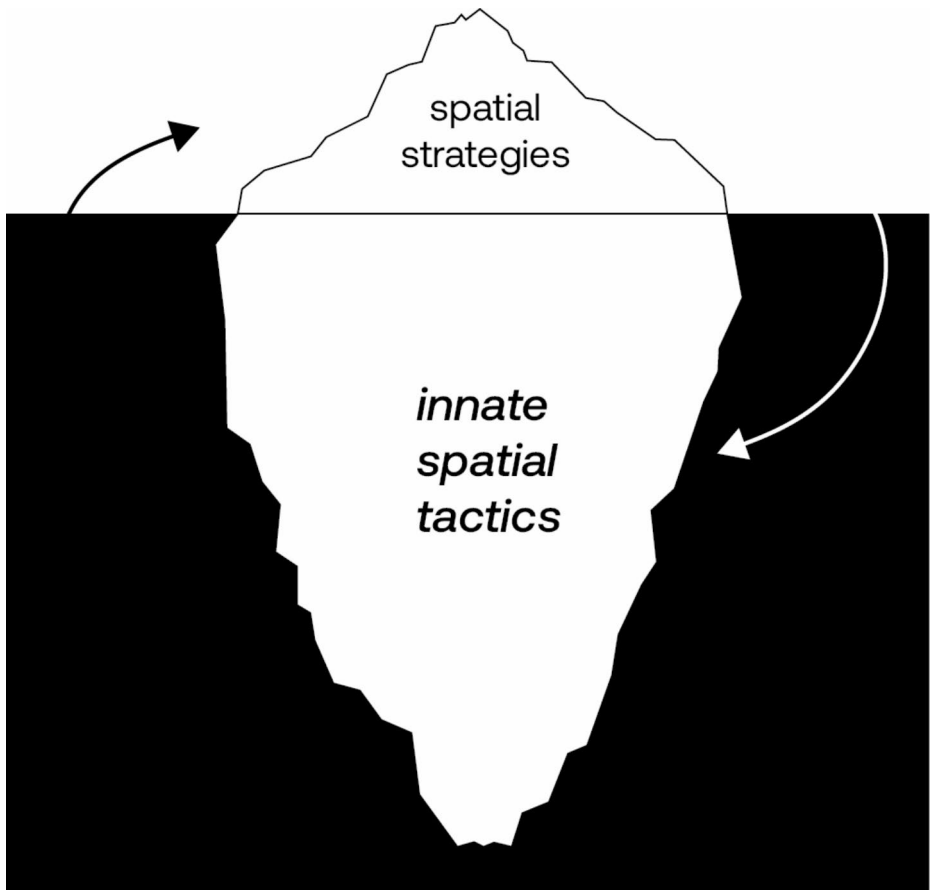


Fig. 2 Adapted diverse economies iceberg framework representing concepts from the literature review on economic diversity in spatial production: spatial strategies and innate spatial tactics. Based on the “diverse economies iceberg” [69] by the Community Economies Collective (CC-BY-SA 4.0)

and hope. Schumacher [80] emphasizes the “wisdom in smallness,” arguing that smaller operations, regardless of their number, are inherently more sustainable than larger ones. He suggests that people in smaller units tend to care more for their resources, and their environmental impact remains minimal compared to nature’s ability to recover. Community economy research recognizes, networks, and transfers knowledge about small-scale everyday practices contributing to broader societal change [70]. At a time when spatial strategies, with their troubling socio-environmental impacts, are in crisis and require urgent transformation, our hypothesis is that much can be learned from innate spatial tactics to facilitate a broader transition toward a CBE. We will further see what can be learned from innate spatial tactics knowledge about circularity and the commons in urban built environments.

Circular R-strategies as Innate Spatial Tactics

Circular systems oppose linear strategies by aiming to eliminate waste by redesigning production, consumption, distribution, and recovery processes, following a cradle-to-cradle vision. They replace the “cradle-to-grave” concept with practices that keep technical resources within the system and allow biobased resources to return to the biosphere [21]. R-strategies such as remanufacturing, repairing, and reusing are central to minimizing waste and reducing the extraction of finite materials [1, 81]. The R-ladder framework (see Fig. 3) establishes a hierarchy where certain practices are considered more circular than others: narrowing resource use is prioritized over slowing, which in turn is prioritized over closing resource loops [82, 83]. However, the literature lacks clarity on how this hierarchy, encompassing practices like reuse, reduce, or refurbish, is applied in the built environment. It is also unclear whether the highest R is always the best solution or if it depends on the context. Traditional linear strategies involve extracting raw materials, assembling them into buildings, and demolishing them at the end of their use, with resources transported globally in between [5]. A CBE aims to close loops across multiple spatial scales: materials, components, buildings, neighborhoods, cities, and regions [13]. Temporally, the built environment involves long resource lifecycles and uncertain future ownership [24]. In addition to materials having varied lifespans, as shown by Brand’s “shearing layers” concept [84]. For example, a building’s concrete structure may last 300 years, while a wooden door might need replacement after 30 years.

Spatial professionals, such as architects, urban planners, or civil engineers, typically focus on specific spatial strategies at certain stages, such as planning, design, construction, or demolition. This approach, described by Salingaros as “hit-and-run construction” [8], raises questions about who maintains resources on a daily basis in the long run. Innate spatial tactics blend the separation of time, place, and action type. Brand’s [84] inner layer of stuff (furniture, supplies, storage place) and space plan (walls, flooring, ceilings) have the shortest lifecycles and often fall under the users’ responsibility, highlighting their potential contribution to a CBE. For example, building life cycle assessments in Germany indicate that interior fittings are significant sources of greenhouse gas emissions [85]. Thus, everyday spatial tactics can significantly enhance circularity in the built environment. Certeau [58] describes “making do” as a tactic where ordinary people use and repurpose available resources creatively, navigating and subverting dominant strategies. It allows individuals to claim autonomy and appropriate space within imposed limitations, which is a form of resistance. Lacaton [86] advocates for “making do” from the perspective of spatial professionals, seeing existing structures as valuable resources rather than constraints. She argues that it is more sustainable to add onto or expand existing structures than to clear a site and start anew.

In community economies, circular practices are innate tactics for community well-being, involving sharing, recirculating, or redistributing resources [87], for example, lending, borrowing, or establishing libraries to help rethink consumption and avoid buying new products. Scholars explore the intersection of circularity and community economies [22, 62], for example, from a historical perspective [61] or as “small stories” of enacted circularity in contemporary contexts [34]. Lekan et al. [74] noted that spaces of alterity both foster inter-

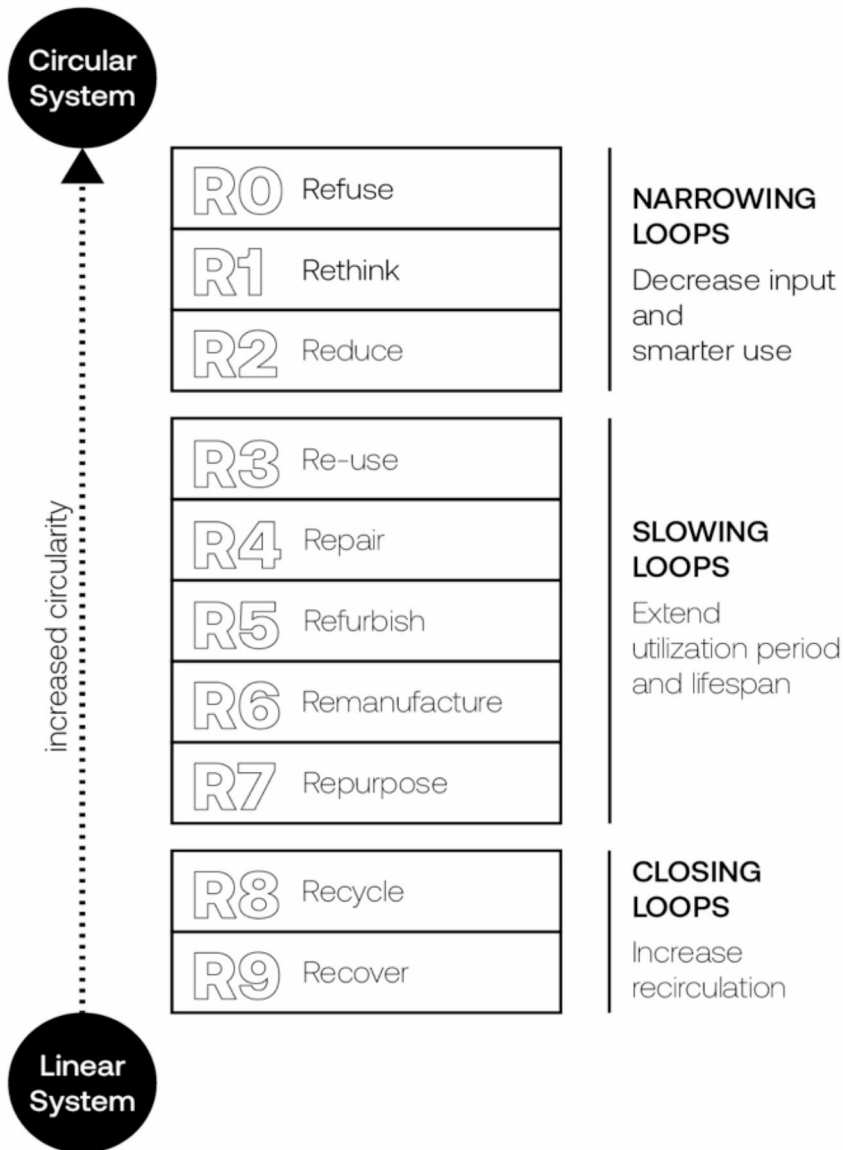


Fig. 3 The r-ladder framework illustrates a hierarchy of circular strategies based on their degree of circularity. Adapted from Potting et al., 2017 [83]

nal resource circulation within community economies and act as sinks for resource outflows from the mainstream economy. Clube et al. [88] argue that circular society concepts benefit from integrating community economy strategies, including nonmonetary exchange [74, 89], informal structures [90], and unpaid labor [91, 92].

The built environment plays a dual role in circular transition. A CBE encompasses various spatial scales, as outlined in the “scales to aspects” model [93]. As physical space, the built environment is a temporary assembly of materials and components, which can be reused when no longer needed in their original form and location [94]. At this material and component scale, CBE requires new construction approaches aimed at closing, slowing, and narrowing resource loops to reduce waste and demand for new materials [16]. As a social space, the built environment at the building, neighborhood, and city levels must facilitate societal circular transition by accommodating r-strategies like recycling, repair cafés, clothes swaps, small-scale production, and remanufacturing [95]. In a CBE some spaces may become obsolete while new spatial needs emerge. Additionally, the efficient use of existing spaces—through temporary, mixed, or shared use—becomes key in a CBE—and this can be fostered through people collaborating.

Commoning as Innate Spatial Tactics

Modern society’s fragmentation of production and consumption “de-skilled” people to cooperate, especially in complex cooperation with people who are different from themselves [96]. Institutional compartmentalization and increased specialization have eroded the ability to collaborate across sectors and roles. Buchanan [7] argues that such confinement of knowledge within rigid silos hinders humanity’s potential. For Schumacher [80], the problem lies in modes of production separated from nature, where fragmented knowledge has estranged people from reality. Particularly in the built environment, human roles along linear resource chains became highly specialized, professionalized, and fragmented (see Fig. 4).

Commoning is an alternative approach to resource management. Hardin’s 1968 essay “The Tragedy of the Commons” [97] suggests that when a community manages a shared resource without government regulation or privatization, individual self-interest will inevitably lead to overconsumption, pollution, and waste, ultimately ruining the resource. However, Ostrom’s [51] vast empirical research has demonstrated that communities can sustainably self-manage common-pool resources without privatization or government intervention. Ostrom’s theory has been expanded by commons scholars, who argue that humans are naturally capable of self-organization and cooperation, contrary to the rational “homo economicus” model of humans as isolated, selfish beings [98].

Commons literature explores how communities establish rules to manage shared resources sustainably and fairly [50, 98]. Commoning, historically one of the oldest resource management methods, opposes enclosure, where communities lose access to resources due to privatization or commodification [99]. Commons theories begin with the premise that people understand their dependence on each other and their environment. Commons can involve various issues, such as open-source software, academic publications, fisheries, forestry, repair manuals, or urban spaces. Importantly, the commons are not just shared resources but complex social processes of continuous collective production and care for resources [100]. Therefore, Linebaugh [99] argues that these processes should be described with the verb *commoning*. Paysan [101] emphasizes that “there is no commons without commoning.” In the following, we will elaborate on the notion of commoning as a process. This is based on the “triad of commoning” suggested by various scholars [52], which includes shared or

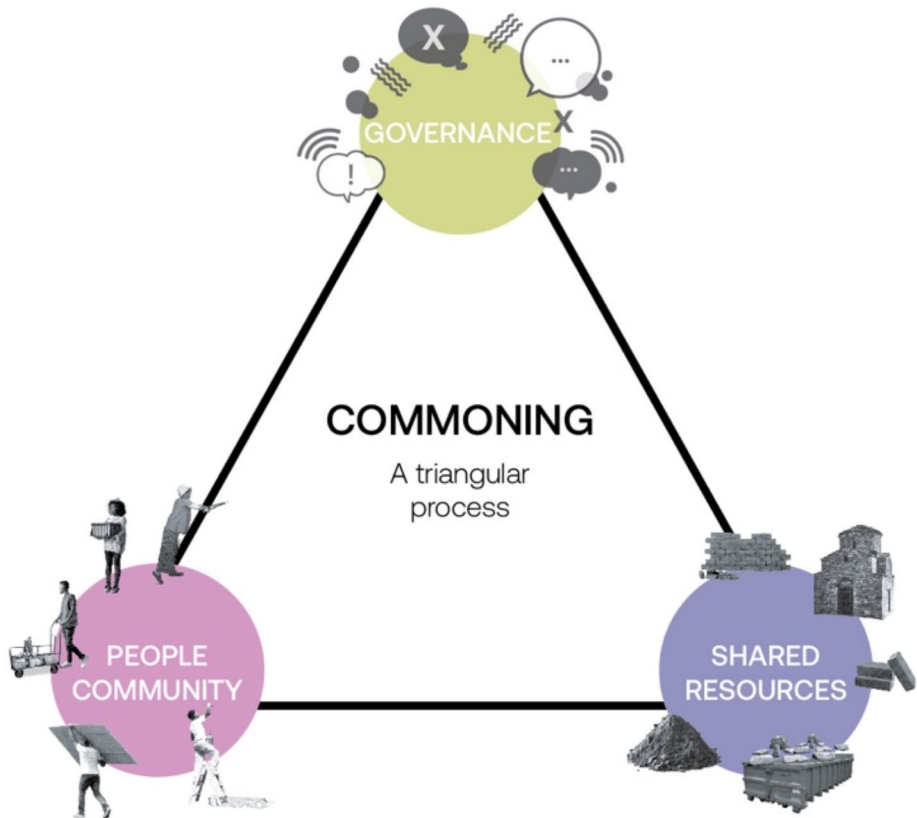


Fig. 4 The triad of commoning comprises shared resources, community, and governance. Adapted from “commoning - a triangular process” by Inkylab (CC-BY-SA 4.0)

common-pool resources, a community of people, and a governance system for sustainable resource management.

Conceptualizing the built environment of a city as a commons goes beyond traditional state or private sector paradigms. Stavridis [52] discusses the production of urban space as a commons, opposing the capitalist production of cities. He emphasizes that communities should not be tied to specific places, nor should space belong to a particular community. Instead, urban space as a commons arises from social interaction. Foster and Iaione [102] propose viewing the city itself as commons, suggesting that this perspective should guide urban governance. They argue that shared urban resources, such as open-access spaces and goods, create a common stake for all city inhabitants. This approach allows for experimenting with alternative policies and legal tools to make these resources accessible to vulnerable and disadvantaged urban dwellers. Despite the extensive literature on natural resource commons building on Ostrom’s theories, they note a lack of adequate understanding of urban commons, which involve new levels of complexities. Salingaros [8] introduces P2P-

Urbanism, highlighting how communities can design and adapt built environments by sharing knowledge openly. Avermaete [56] argues that the city is one of the main tangible forms in which the commons exist today. Practice research by Petrescu et al. [103] observed neighborhood-level commons' potential for community resilience, showing how citizens in a Parisian suburb became active commoners, building and governing urban commons despite political struggles. Commons theories suggest that commoning as innate spatial tactics rooted in historical practices can effectively balance human and environmental needs.

Circular Commoning as Innate Spatial Tactics: A Conceptual Framework

The review of theories on circularity and the commons indicates that these concepts are closely related. Both involve complex social processes where people interact to manage (shared) resources sustainably. Commoning entails communities producing, managing, and caring for shared resources for everyone's benefit within environmental limits. Circular practices aim to minimize waste, use resources efficiently, prolong their utilization, and increase their recirculation. Both concepts are innate tactics integral to community economies.

Circularity and commoning are longstanding concepts in both everyday life and academic discourse and are gaining renewed attention amid current socioecological crises. In everyday life, they reflect how people have interacted with resources throughout history [61, 99]. Theoretically, circularity draws from frameworks such as cradle-to-cradle, industrial ecology, biomimicry, the blue economy, and regenerative design, which are frameworks developed to address resource scarcity. The commons have played significant roles in resistance movements, such as those against land enclosures in England (15th–19th century) and the Italian “autonomia” movement (1960s). Today, both concepts seek to integrate traditional approaches into contemporary contexts without glorifying “doing things as they used to be” [57].

Circularity and commoning are holistic processes inspired by nature, balancing community and environmental well-being. They transcend modern fragmentation but instead integrate economic, social, and environmental considerations while eliminating waste and negative externalities. Circular processes mimic natural systems, emphasizing principles such as waste equals food, building resilience through diversity, using renewable energy, and thinking in systems. Similarly, commoning harmonizes human needs with planetary limits, rooted in the understanding that humans are part of nature, making individual well-being inseparable from community and environmental health [53, 54]. In commoning there is no property, so there is also no waste, as resources remain in use [53].

Related to spatial production, Gibson [26] discusses the example of a bamboo bridge over the Mekong River in Cambodia as a holistic community economy. The film “The Bamboo Bridge” [104] documents how a 1.5 km bamboo bridge was rebuilt annually during the dry season by the local community out of the necessity to be connected to the city (tactics). In 2017, it was replaced by a government-planned concrete bridge (strategy). For more than fifty years, the community-led construction of the bamboo bridge facilitated transport and fostered a holistic community economy based on reciprocity, care, repair, shared labor, and biobased resources. This is an example of circular commoning as innate spatial tactics, balancing human and environmental needs. It is a circular practice, as the bridge, mainly built of local bamboo, is disassembled, stored, and rebuilt in yearly cycles, using minimal materials and respecting the river's seasonal strength. The commons encompass more than

the physical structure; it includes community collaboration, hand-drawn plans, technical knowledge, maintenance work, rule negotiations, and even seasonal river changes. In contrast, the concrete bridge relies on global resource chains and external professional services. While the concrete bridge offers practical advantages, Gibson emphasizes the value of the knowledge and skills involved in innate spatial tactics, such as building with renewable materials, local workforce, and natural rhythms. Such knowledge might be urgently needed in the future (or present) to reduce reliance on limited technical resources Fig. 5.

This review showed that although circularity and commoning are closely related, little theory was found connecting them in the context of the built environment. The theory further indicated the two concepts could be mutually complementary. Commoning is described as social processes based on a triad of people, resources, and governance but lacks clarity on approaches to sustainable resource management, which circular strategies can address. Conversely, circular models propose clear strategies for resource management through R-strategies but lack details on social actors and organizational approaches. Therefore, this paper integrates the two concepts into a conceptual framework of *circular commoning*, providing a foundation for learning from empirical examples of innate spatial tactics (see Fig. 6). This conceptual framework derived from the literature review combines the commons triangle with circular principles in the production of the built environment. It focuses on three dimensions and their interactions: resources, people, and governance.

Resources: Which Resources Do People Manage in a Circular Way?

Circular commons evolve around closing, slowing, and narrowing loops of shared resources, both tangible and intangible. In the built environment, tangible resources include all physical elements. Intangible resources encompass norms of space usage, social interactions,



Fig. 5 The bamboo bridge, representing innate spatial tactics and principles of circularity and commoning (right), was replaced by the concrete bridge, exemplifying a spatial strategy (left). Scenes from the documentary film “The Bamboo Bridge” [104] directed by Juan Francisco Salazar. Images used with permission

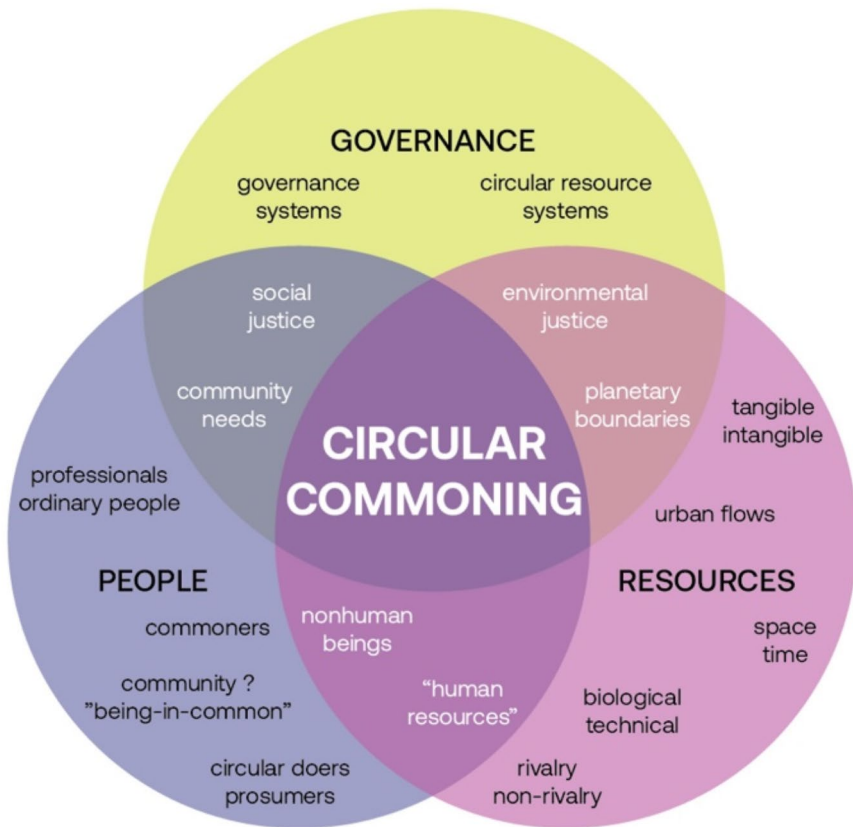


Fig. 6 Circular commoning framework: a basis for analyzing innate spatial tactics across three dimensions and their interactions: resources, people, and governance

knowledge, memories, and everyday spatial tactics. In commons theory, Ostrom distinguishes [105] “rivalry” and “non-rivalry resources.” Rivalry resources are depleted when used by one person; for example, a fish caught by one person cannot be caught by another person. Non-rivalry resources, such as knowledge, can be freely shared.

Circular models differentiate between biological and technical resources, akin to renewable and non-renewable resources, as illustrated by the “butterfly diagram” [106]. Biological resources are naturally renewable and can biodegrade, returning nutrients to the environment. Technical materials cannot biodegrade and become waste when out of use. In a circular system, they must be continuously cycled at their highest value. The “construction material pyramid” visualizes the environmental impact associated with the production of the most common building materials, placing the most sustainable and least environmentally harmful at the bottom [107]. Resource sharing enhances effective use. Materials, components, and buildings can be reused on an individual level. At the neighborhood scale, people come together and can find synergies. On the city scale, urban metabolism encompasses all energy and material flows that enter, circulate, and leave an urban system.

People: Who Manages Resources in a Circular Way?

In circular commoning, people manage shared resources sustainably, respecting planetary boundaries, avoiding waste, and benefiting all community members. Circular models have been criticized for overlooking the role of people, neglecting who the actors are and how they collaborate to cycle resources. The “butterfly diagram” [106] shows people as passive consumers, without clarifying who is responsible for cascading resources [108]. Holmes et al. [3] propose recognizing consumers as “circular doers” who invest labor in everyday circular activities to keep resources in the loop. Producers and users become the same person through “prosumption work” [109], such as fixing appliances or cooking meals from leftovers. Viewing people as circular doers acknowledges the labor, knowledge, creativity, and skills involved in circular activities, which are intangible resources (i.e., “human resources”).

Theories on the commons emphasize communities managing shared resources through agreed-upon rules, where each member is co-responsible. Commoners both contribute to and rely on these shared resources. Commoning processes both require and create communities, as exemplified in urban gardens [110]. Defining community is complex. Classical views of the commons talk about groups of people who share land for their cattle. De Angelis [52] notes that communities can transcend locality. Stavridis [52] suggests conceptualizing urban commons based on the public rather than homogenous groups. Concepts of “communitarianism” are criticized for idealizing communities as homogenous, solid groups and inherently “doing good.” Communitarianism became a “magic tool” to overcome social challenges in Western society [111]. Wenger [112] warns against perceiving communities as static and closed. In this paper, we draw upon Nancy’s [113, 114] anti-essentialist view of community as an ongoing process of “being in common” without erasing individual identities, preserving diversity and difference. A community is not a project of fusion, as “being-in-common is not a common being” [113].

Gibson-Graham and Miller [115] extend “being-in-common” to a multispecies community concept, where nonhuman life is part of the community, not just a resource. For example, the fruit trees of a cooperative farm are part of the community, not just shared resources [115]. According to critical post-humanist views, the separation between resources and people fades, blending the two.

Governance: How Are People and Resources Organized in Systems?

Ostrom proposes a framework to analyze the sustainability of socioecological systems [116]. She identifies resource systems (e.g., forests, water) and governance systems (e.g., government, local rules). She suggests ten variables that influence the sustainable management of shared resources. Helfrich [100] proposes viewing the system (ocean) rather than individual resources (fish) as commons. Viewing the city as a commons adds complexity beyond individual commons and proposes a new approach to urban governance. This approach enables residents to actively participate in regenerating their habitat, improving lifestyles, and building their communities. For example, the “co-city protocol” [117] provides a clear framework for managing the city as a commons with a toolset applied in a five-step cycle (talking, mapping, practicing, prototyping, testing).

The governance of the commons involves establishing rules to manage shared resources fairly and within ecological limits. In “Governing the Commons,” Ostrom [51] empirically analyzes the conditions under which common-pool resource problems are solved. She highlighted the diversity of governance forms, which are more nuanced than purely state or private-sector solutions. Successful governance often mixes public and private elements, and institutions can be formal or informal. The built environment as a resource system could be a neighborhood, a housing cooperative, a supply chain, or an entire city.

Urban metabolism views cities as living systems that consume resources (materials, water, food, and energy), process them, and produce waste, like living organisms. It involves studying the inputs, recirculation, and outputs of urban systems. Ostrom argued that long-term sustainability depends on rules matching resource systems and users’ attributes. Communities constantly renegotiated these rules [100]. For example, community gardens need a balance between freedom and agreed-upon rules [110]. Stavridis [52] suggests that the successful governance of urban commons relies on negotiation platforms. There is no universal solution for the governance of the commons, as each process is unique [100].

Practice Review: Empirical Examples of Circular Commoning as Innate Spatial Tactics

We tested the conceptual framework through a practice review. By identifying and analyzing 16 empirical examples of innate spatial tactics, we explored the three dimensions of circular commoning: resources, people, and governance. This practice review identified three forms of circular commoning in the production of the built environment.

Inventory of Empirical Examples of Circular Commoning

We first reviewed diverse sources to find empirical examples that combine circular and commoning principles in the production of the built environment. We reviewed books, exhibition catalogs, online platforms and databases², academic journals, and media, primarily in the fields of architecture and urban studies. Our selection was based on three criteria derived from the theory review:

1. *Circularity*: Examples contribute to slowing, narrowing, or closing resource loops in the built environment.
2. *Commoning*: Examples where people actively come together to self-manage shared resources sustainably.
3. *Urban context*: Examples are situated in contemporary urban environments.

This exploration led to an initial inventory of 156 examples³. Selected examples combined all three criteria. For example, we excluded processes that emphasized social aspects of circularity without involving commoning principles, such as the user-centered design

² We reviewed platforms such as Circle Economy Foundations database (over 100 cases: https://knowledge-hub.circle-economy.com/cases?_sort=1); Story of Stuff’s Grassroots Grants Program (79 case studies: <https://www.storyofstuff.org/grassroots-grants/>); Foundation for Intentional Community’s database (more than 1000 case studies: <https://www.ic.org/directory/>); UN Habitat’s Best Practice database (over 5000 case studies from 140+ countries: <https://www.urbanagendaplatform.org/best-practice>); Reflow Project’s Best Practices database in “Citizen engagement” (<https://reflowproject.eu/best-practices/>) and some others.

³ The full inventory of examples is documented in the database in Appendix A.

of circular social housing projects where residents remained passive users. At this stage, the examples in this inventory were not reviewed in detail but were initially identified as likely involving aspects of circularity and commoning in urban contexts. Some cases, like “Haus der Materialisierung,” described as a “living lab for circular lifestyles,” explicitly involve these principles. Others, like networks of waste pickers and recyclers, were not previously described as circular but clearly involve circular r-strategies, suggesting these concepts more implicitly.

In a second round we aimed for diversity in selected examples. We collected additional data from sources accessible through desk research, including academic and grey literature, audio and visual recordings, and social media⁴. The availability of such data was a basic criterion for further consideration. We also aimed for diversity through the following criteria:

1. *Spatial scales*: Diversity in scales of a CBE (materials and components; buildings and open spaces; neighborhoods; cities). We skipped the regional scale since few commons-based practices operate at this level.

1. *Involved actors*: Diversity in involved actors, including processes initiated and led by citizens, spatial professionals, or local governments.

2. *Geographic contexts*: A range of geographic contexts, but all within urban settings.

The selection process identified 16 diverse examples of circularity and commoning in urban contexts, varying in spatial scale, actors, and context (see Table 1). These innate spatial tactics, often rooted in grassroots movements, counter-communities, activist groups, and urban informalities, are represented in the lower part of the iceberg (see Fig. X). The diversity in examples was intentional, aimed at broad exploration of the circular commoning framework rather than comparability of cases. Given the limited documentation of urban informalities in academic and grey literature, we expanded our sources to include social media. The examples encompassed diverse urban functions, including working, housing, circular hubs, urban experiments, and living labs Figs 7, 8, and 9.

Analysis of Empirical Examples of Circular Commoning

This section provides initial insights from applying the conceptual framework to empirical examples. Given the exploratory nature of the study, the results are presented as an inventory of insights rather than complete case study narratives. The review helped test and refine the framework for circular commoning as innate spatial tactics, providing practical insights into the interplay of resources, people, and governance in the built environment Fig. 10.

Dimensions of Circular Commoning: Resources

Examples of circular commoning revolved around closing, slowing, and narrowing loops of common-pool resources in the built environment. We observed processes involving “unwanted” technical resources such as reclaimed and salvaged building materials or urban waste, locally harvested bio-based resources, vacant buildings and urban wasteland, water, food, energy, and intangible human resources.

“Unwanted,” Reclaimed, Salvaged, Technical Resources Circular commoning processes often centered on reclaimed and salvaged building materials and components. Technical

⁴ All reviewed sources for the 16 examples are listed in Appendix B.

Table 1 Sixteen empirical examples of circular commoning selected based on defined criteria, all involving principles of circularity and commoning in urban contexts; while exhibiting diversity across spatial scales, involved actors, and geographic contexts

	Title	Short Description	Circularity	Commoning	Urban Context
EX01	BlueCity	Adaptive reuse of a former swimming pool into a circular production hub, using locally reclaimed materials. Circular entrepreneurs share spaces and aim to form a closed-loop system.	adaptive reuse; reclaimed materials; circular production hub	circular initiatives self-manage shared building and resource flows	Rotterdam Netherlands
EX02	Baukarussell	Social enterprise focused on “social urban mining,” disassembling buildings to salvage materials while providing job training for people disadvantaged in the labor market. Revenue supports social initiatives.	urban mining; disassembly; salvaged materials; reclaimed materials; insitu reuse	social urban mining fosters community around salvaging resources.	Vienna Austria
EX03	Buurman	Urban resource center with a second-hand building material market and open workshops for reclaimed wood. Salvages wood waste from building industry for redistribution and training of citizens.	urban resource center; second-hand building material market; reclaimed materials; salvaged materials	self-organized group to salvage and reuse urban wood waste	Rotterdam Netherlands
EX04	Cartoneros	Self-organized network of waste collectors salvaging and sorting recyclables all over the city as survival economy. Some cooperatives are recognized by the city government as part of a zero-waste strategy.	city-wide network of waste collectors; reclaimed materials; salvaged materials; urban scavenging	self-organized urban waste pickers (cooperatives)	Buenos Aires Argentina
EX05	De Ceuvel	Temporary workplaces for artists and creatives in repurposed houseboats on a polluted former shipyard, while recuperating the soil through phytoremediation. Includes “circular prototypes” for local food and energy production, closed water cycles and composting.	soil regeneration; activation of underused spaces; circular prototypes; reclaimed materials; repurposed houseboats	community of artists and creatives activate urban wasteland as a self-organized circular workplace	Amsterdam Netherlands

Table 1 (continued)

	Title	Short Description	Circularity	Commoning	Urban Context
EX06	Diseño Informal B31	Academic-community workshop co-designing low-cost prototypes in a self-built neighborhood using reclaimed materials. Avoids demolition through punctual structural interventions.	reclaimed materials; leftover materials; repair	groups of students, craftspeople and residents co-produce prototypes for housing repair	Buenos Aires Argentina
EX07	Eleonas Scavenger Market	A self-organized pop-up recycling market (“Pazari Rakosyllektion”) on weekends in a post-industrial area as essential survival economy for citizens. Waste collectors sell salvaged resources. The market faces threats of eviction.	city-wide network of waste collectors; reclaimed materials; salvaged materials; recycling market; activation of underused spaces; urban scavenging	self-organized urban waste pickers (unions) run a recycling market	Athens Greece
EX08	Granby Four Streets	Community reactivates a derelict neighborhood and saves homes from demolition using creative activism and DIY urbanism, forming a community land trust, refurbishing houses and producing circular building products from leftovers.	circular building products; leftover material; activation of underused spaces; salvaged materials; reclaimed materials; repair	residents self-organize to save their houses from demolition and form community land trust	Liverpool UK
EX09	Haus der Materialisierung	Former archive building repurposed as a temporary urban resource center, housing circular initiatives offering reclaimed materials and open workshops for citizen’s DIY projects - a living lab for circular lifestyles.	urban resource center; second-hand building material market; adaptive reuse; reclaimed materials; salvaged materials	circular initiatives self-organize and activate shared vacant building	Berlin Germany
EX10	Kibera Public Space Project	Spatial professionals set up community-led public spaces transforming dumpsites in a self-built neighborhood, integrating flood prevention using bio-based and reclaimed materials. Spaces are self-managed by communities.	activation of underused spaces; reclaimed materials; bio-based materials	local communities self-manage public spaces and green infrastructure for flood prevention	Nairobi Kenya

Table 1 (continued)

	Title	Short Description	Circularity	Commoning	Urban Context
EX11	Ludoteca Merced	University prototype for sustainable housing relocated and repurposed as a community space after an earthquake, transported and rebuilt through traditional mutual aid practices (“minga”) with bio-based materials.	adaptive reuse; dis- and reassembly; bio-based materials	self-organized mutual aid and collaborative work to relocate and adapt building	Valparaiso Chile
EX12	Mercat Dels Encants	Historic self-organized street-recycling-market now formally integrated into the municipal network and relocated to a new building, preserving its street-market character and auction traditions.	city-wide network of waste collectors; reclaimed materials; salvaged materials; recycling market; urban scavenging	market traders (association) self-manage building and auctions in collaboration with the municipality	Barcelona Spain
EX13	Minalesh Tera	Self-organized recycling market with a network of waste collectors, sorters, and artisans behind. Salvaged materials are sorted, upcycled, and resold, significantly contributing to the urban waste management. Faces increasing pressures from urban renewal plans.	city-wide network of waste collectors; reclaimed materials; salvaged materials; recycling market; artisanal upcycling, refurbishing and repairing; urban scavenging	self-organized urban waste pickers (unions), artisans, upcyclers and recycling market	Addis Ababa Ethiopia
EX14	RUS Lima	Abandoned urban railway transformed into a temporary community playground using salvaged materials. Project co-designed with local communities and artists.	activation of underused spaces; reclaimed materials; salvaged materials; left-over materials; building from urban waste	community-led spatial transformation of urban ruins	Lima Peru
EX15	R-Urban	Initiative to create citizen-managed urban commons for resilient neighborhoods, activating vacant lots, potentially connecting in a network. Includes local production and resource sharing hubs that can be dis- and reassembled.	circular neighborhood hub; circular prototypes; activation of underused spaces; dis-and reassembly; reclaimed materials; salvaged materials	self-organized neighborhood hubs around shared resource use, consumption and production	Paris France

Table 1 (continued)

	Title	Short Description	Circularity	Commoning	Urban Context
EX16	Volontariat Home	Cluster of domed houses constructed from onsite materials and urban waste. The process involves local labor, minimal purchased materials, and emphasizes community investment. “Baking a house” as a low-cost, low-tech building approach for affordable housing.	insitu reuse; building from urban waste; bio-based materials; leftover materials; reclaimed materials	local workers come together in building with local soil	Pondicherry India

**Fig. 7** Sixteen empirical examples of circular commoning mapped across diverse geographic contexts

resources at “end-of-use” or leftovers from the construction industry typically become construction and demolition waste. Viewing the built environment as a temporary assembly of technical materials means that “unwanted” resources can be salvaged, reclaimed, and reused. Innate spatial tactics reused salvaged resources locally and in a timely manner, avoiding transport and storage. Salvaged materials were reused onsite within a building (EX01), a neighborhood (EX08), or a city (EX01, EX05, EX06, EX14, EX15). Processes also absorbed solid urban and industrial waste, which was collected, sorted, and redistributed (EX04, EX07, EX12, EX13) and upcycled as building materials (EX10, EX14, EX15, EX16). Others focused on redistributing “unwanted” materials to new users (EX02, EX03, EX09, EX12, EX13).

MATERIALS COMPONENTS	EX02 Baukarussell Vienna, Austria	EX03 Buurman Rotterdam, Netherlands	EX06 Diseño Informal B31 Buenos Aires, Argentina	EX14 RUS Lima Lima, Peru
BUILDINGS OPEN SPACES	EX01 BlueCity Rotterdam, Netherlands	EX09 Haus der Materialisierung Berlin, Germany	EX11 Ludoteca Merced Valparaiso, Chile	EX16 Volontariat Home Pondicherry, India
NEIGHBORHOODS	EX05 De Ceuvél Amsterdam, Netherlands	EX08 Granby Four Streets Liverpool, UK	EX10 Kibera Public Space Project Nairobi, Kenya	EX15 R-Urban Paris, France
CITIES	EX04 Cartoneros Buenos Aires, Argentina	EX07 Eleonas Scavenger Market Athens, Greece	EX12 Mercat Dels Encants Barcelona, Spain	EX13 Minalesh Tera Addis Ababa, Ethiopia

Fig. 8 Sixteen empirical examples of circular commoning mapped across spatial scales, arranged from top to bottom: materials and components, buildings and open spaces, neighborhoods, cities; left to right in alphabetical order

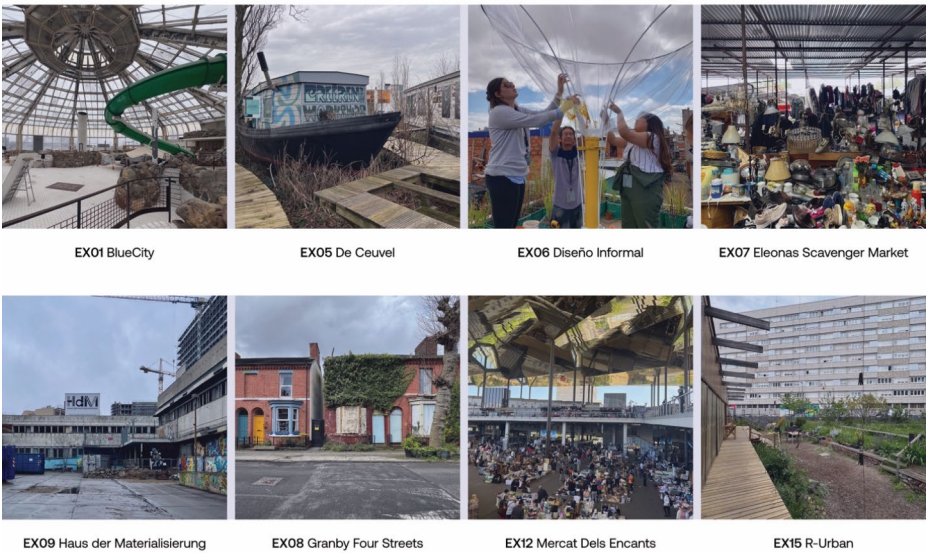


Fig. 9 Photographs of eight empirical examples of circular commoning

Bio-based Resources Circular commoning processes emerged around biological resources, which were ideally locally harvested in cities. Excavation material, a major waste in traditional construction, became a valuable resource by using onsite soil to construct mud houses (EX16) or starting community-based earth-pressed brick production (EX10). Excavation material from nearby construction sites was used for urban agriculture (EX15) or redistributed across the city as needed (EX02). Bio-based resources, such as natural dye from urban plants, were also harvested in urban environments (EX05, EX09).

Abandoned Buildings, Derelict Neighborhoods, Urban Wasteland Circular commoning processes activated unused buildings and open spaces as resources. Some repurposed abandoned buildings, such as a former swimming pool (EX01), a warehouse (EX01), an archive building (EX09), or the ruins of an unfinished train infrastructure (EX14). Residents reactivated an entire derelict neighborhood (EX08). Others transported unused buildings to different locations (EX11, EX15). After being transported from a university campus to an earthquake-affected neighborhood (EX11), a sustainable housing prototype was repurposed as a community center. In the struggle for access to urban space (EX03, EX04, EX07, EX09, EX12, EX13), spatial tactics creatively revalued urban wastelands, including post-industrial areas (EX05, EX07) or neighborhood dumpsites and vacant lots (EX10, EX15). In De Ceuvél (EX05), an abandoned former shipyard was regenerated with plants that cleaned the polluted soil through phytoremediation.

Local Water, Food, Energy Cycles Circular commoning also focused on closing, narrowing, and slowing water, food, and energy flows. Processes generated renewable energy from sources such as solar and wind power (EX05, EX15); closed water cycles by collecting rainwater and purifying grey and black water with helophyte filters (EX05, EX15); produced food locally through urban farming, and returned nutrients to the soil by composting (EX05, EX10, EX15). In BlueCity (EX01), the waste of one food producer became another's resource, as leftover CO₂ from beer brewing was used by another entrepreneur to grow spirulina.

Intangible "Human Resources" Circular commoning processes required more human resources, such as labor, skills, and knowledge, but used fewer new materials than traditional spatial strategies. For example, mud houses were built with locally harvested soil and much labor from the community but with minimal purchased materials (EX16). Circular activities required specific skills and knowledge, such as maintaining urban farms (EX15) or green infrastructure (EX10). Workshops, events, and communication strategies emphasized building such skills and knowledge (EX01, EX02, EX03, EX06, EX08, EX09, EX10, EX13, EX14, EX15). In Minalesh Tera (EX13), craftspeople upcycled resources in public space, which became an open school for circular skills where everyone could observe and learn. Apart from circular skills, capacities for self-management were crucial, with spatial professionals passing on skills through civic pedagogy (EX10, EX15). "Human resources" connect the framework's dimensions of people and resources.

Dimensions of Circular Commoning: People

In circular commoning processes, people collaborated to manage shared resources sustainably. The roles of actors were dynamic, often blurring the lines between producers and consumers, citizens and professionals, and even between human and nonhuman actors. Marginalized groups, such as those salvaging resources from waste, played crucial roles.

Circular Doers and Prosumers Circular commoning processes often blurred boundaries between producers and consumers, as well as between spatial professionals and ordinary people (EX03, EX05, EX08, EX09, EX11, EX14, EX15). As commoners, people contributed to and relied on shared resources. Circular doers invested energy in slowing, narrowing, and closing resource loops. People actively engaged in construction, maintenance, repair, refurbishment, and disassembly, becoming “prosumers.” In Haus der Materialisierung (EX09) the community depended on the building as workspace, while also maintaining it and constantly negotiating rules for its use. In De Ceuvel (EX05) compost toilets needed constant care and work, while traditional sanitary facilities require minimal intervention from users.

Spatial Professionals and Ordinary People One group of examples was initiated by ordinary people who self-managing shared resources (EX03, EX04, EX05, EX07, EX08, EX09, EX12, EX13), such as activists for more sustainable ways of living (EX03, EX09), artists reclaiming access to affordable spaces in cities (EX05, EX09), residents saving their neighborhood (EX08), or individuals seeking income (EX04, EX07, EX12). The second group was driven by spatial professionals exploring alternative professional pathways (EX01, EX02, EX06, EX10, EX11, EX14, EX15, EX16). Some of them replicated successful experiences in other processes (EX01, EX02, EX08, EX10, EX14, EX15) or involved architectural education to explore future professional pathways (EX06, EX11). Spatial professionals also capacitated citizens with skills and knowledge to self-manage processes. In Kibera Public Space Project (EX10), professionals initiated public space transformations and then handed over maintenance to local communities.

Harvesters, Recyclers, Upcyclers, Remanufacturers, Repairers, and Redistributors In urban resource networks, people collected, sorted, and reused resources. Harvesters included disassemblers salvaging building components (EX02), urban scavengers reclaiming resources from waste (EX04, EX07, EX12, EX13), and material scouts recovering leftovers from various industries (EX01, EX03, EX09). Urban scavengers, often self-organized and informal, significantly contributed to waste management (EX04, EX07, EX13). After harvesters, recyclers, upcyclers, remanufacturers, and repairers, usually with artisanal skills and access to workshops, processed the resources. In some cases, they used public spaces for their activities (EX13), while urban resource centers incorporated workshops (EX09, EX15). Redistributors found new users for reclaimed resources through recycling markets and second-hand material platforms (EX01, EX02, EX03, EX07, EX09, EX12). In some examples, large quantities of collected resources were sold to the recycling industry (EX04, EX13). These people bridged the gap between industry and citizens, exchanging resources and reducing waste. In Buurman (EX03), wood leftovers were collected from the construction industry and made available for small-scale projects.

Nonhuman Beings In some examples, nonhuman actors, such as animals, plants, and soil, played important roles (EX05, EX15). In De Ceudel (EX05) plants cleaned polluted soil of the former shipyard. Nonhumans connected the framework's dimensions of people and resources.

Dimensions of Circular Commoning: Governance

Governance in circular commoning involves managing and regulating shared resources to ensure their sustainable use and benefit for all actors. Governing the commons in a circular manner is complex and requires self-management skills, as seen in various examples (EX10, EX15).

Formal– Informal Governance Circular commoning processes featured a mix of governance forms, including self-managed, public, private, alternative, and informal systems. Tensions arose between the formal and informal parts due to power imbalances. Some processes that began informally, such as squatting or artists' interventions, eventually found formal agreements (EX01, EX09, EX12). The self-organized street market *Mercat Dels Encants* (EX12) became a municipal market, offering benefits such as a new market building but also imposing municipal rules. This change excluded vendors without legal permission, leading to significant tensions. Circular commoning practices often struggled for recognition and survival within formal systems, such as residents facing neighborhood demolition (EX08), informal recycling markets facing eviction (EX07, EX13) or the temporary restriction of municipal land use (EX05, EX15).

Alternative Labor, Property, Enterprises, Finance, Transactions Circular commoning processes developed alternative forms of organization across labor, property, enterprises, finance, and transactions. Enterprises included social enterprises addressing social or environmental issues (EX01, EX02), community interest companies (EX08), cooperatives (EX12), and unions (EX07). De Ceudel (EX05) is a *zooperative* where nonhuman beings, such as fish, birds, and plants, have representation in community decisions. This model integrates nonhuman interests into decision-making, highlighting a symbiotic relationship between humans and nonhumans. Both paid and unpaid labor were involved, with unpaid labor often yielding alternative benefits. In Kibera Public Space Project (EX10), the community contributed 5% of the project costs through labor and, in return, benefitted from access to the space. Haus der Materialisierung (EX09) was maintained through community workdays (*subbotniks*), and Ludoteca Merced (EX11) was transported and reassembled through collective mutual aid (*minga*). Alternative ownership models included community land trusts (EX08), temporary public land use agreements (EX05, EX09, EX15), and informal urban space occupations (EX04, EX07, EX12, EX13). Financing often relied on external public or multilateral funding, creating dependencies (EX06, EX09, EX10, EX14, EX15). Transactions included sales at urban resource centers and recycling markets (EX03, EX07, EX09, EX12, EX13), sharing through platforms (EX09, EX15), and using community currencies like blockchain-based tokens for solar energy exchange (EX05).

Incrementality and Temporality Many processes grew incrementally, guided by a long-term vision that evolved over time (EX01, EX08, EX10, EX15). Temporary projects allowed for experimentation and deviation from standardized rules (EX05, EX09, EX14, EX15). Governance was typically a learning process with no fixed rules; each example was unique, and rules were constantly renegotiated as processes evolved. Some examples negotiated rules by doing through daily activities, such as self-organized recycling markets (EX07, EX13). In Granby Four Streets (EX08), guerilla gardening and DIY urbanism also needed rule negotiation, as residents reclaimed streets of a derelict neighborhood as green spaces. Apart from going together, community meetings served as platforms for ongoing negotiations (EX05, EX08, EX09, EX15).



Fig. 10 Refined circular commoning framework based on the review of 16 empirical examples

Spatial Scales and Localities of Circular Commoning

Reviewing empirical examples revealed that most circular commoning processes spanned multiple spatial scales: materials and components, buildings and open spaces, neighborhoods, and cities. For example, in Kibera Public Space Project (EX10), a community used onsite soil to produce earth-pressed bricks (materials and components) to build a community center (building) where neighbors gathered for various activities (neighborhood)—these productive public spaces span a network across the informal settlement of Kibera (city). If buildings are no longer needed, the bricks can return to the soil or be reused. This highlights the built environment as a temporary assemblage supporting social life across scales Fig. 11.

We identified three key points about the locality of circular commoning practices. First, they combined local and city-wide processes. While urban resource flows are often seen as non-local, they required social spaces for production, storage, exchange, and repair. For instance, urban waste collectors gathered resources all over the city, but needed specific locations to trade, sort, store, remanufacture, and resell materials (EX04, EX07, EX12, EX13). Second, the neighborhood scale was crucial—it was small enough for personal interaction yet large enough to involve significant flows of resources and people (EX05, EX06, EX08, EX10, EX11, EX15). Third, managing resource flows and social structures on a large city scale was challenging for individuals (EX04, EX07, EX12, EX13), while smaller scales (materials and components, buildings) were often tied to private ownership.

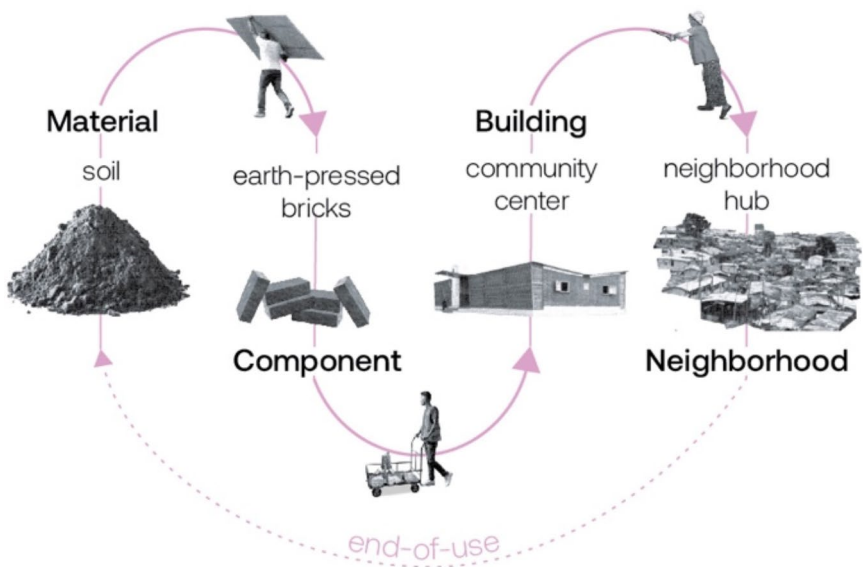


Fig. 11 Circular commoning processes combined multiple spatial scales with the example of Kibera Public Space Project (EX10): from soil (material) to earth-pressed bricks (component) to community center (building) to multi-purpose neighborhood hub (neighborhood)

Three Forms of Circular Commoning as Innate Spatial Tactics

The practice review identified the most prevalent innate spatial tactics⁵, Fig. 12 summarizes the most frequently observed ones. This revealed three distinct forms of circular commoning and the role of the built environment: building circular, circular use of space, and creating spaces for circular activities. Most examples combined these forms. The following section will discuss them in more detail.

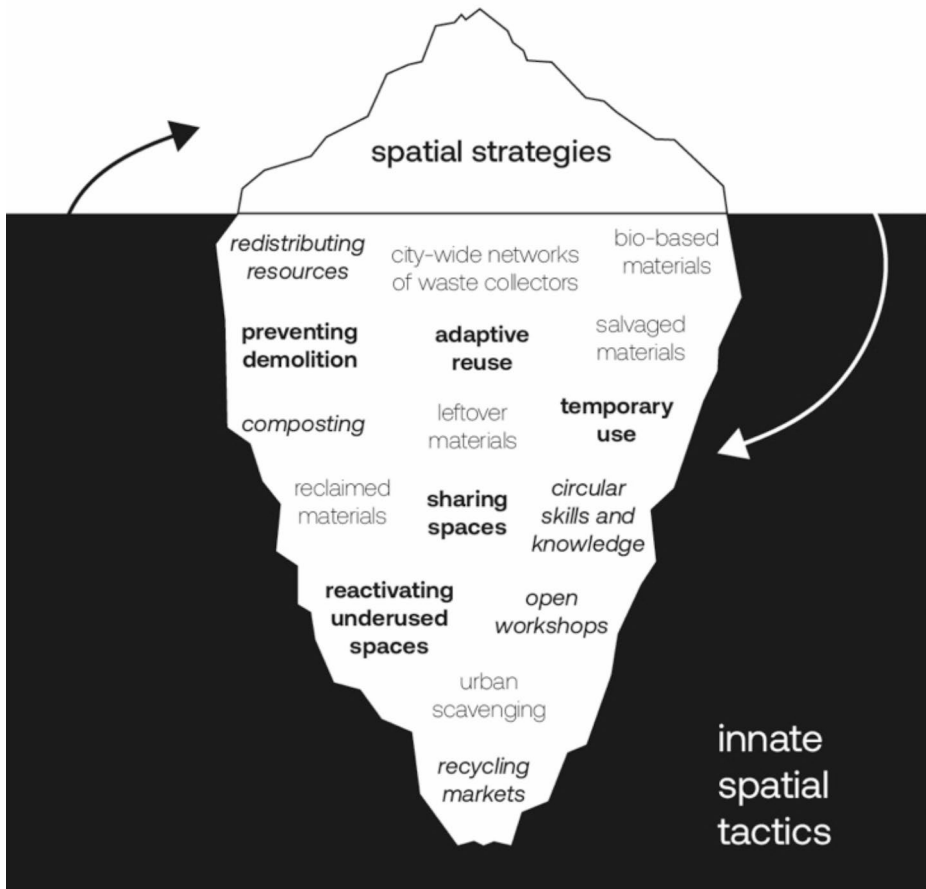


Fig. 12 Diverse economies iceberg of circular commoning: the most frequently appearing innate spatial tactics in the practice review: building circular (light); circular use of space (bold); creating spaces for circular activities (italic). Based on the “diverse economies iceberg” [69] by the Community Economies Collective (CC-BY-SA 4.0)

⁵ Appendix C illustrates the process of analyzing innate spatial tactics based on their frequency of occurrence and categorizes them into three different forms.

Building Circular

Some examples involved designing and building according to circular principles, focusing on the construction and end-of-life stages.

Not Building or Building less Some examples refused to build anything and utilized existing spaces creatively rather than constructing new. Diseño Informal (EX06) involved the repair of structural issues in self-built houses using low-tech interventions using minimal material as an alternative to demolition and rebuild.

Mining the city The city became a source of secondary materials harvested from the urban environment. This process, known as urban mining, involved salvaging unwanted or leftover building materials for reuse. Urban mining provided employment opportunities because it required more labor than demolition (EX01, EX02). Some processes harvested bio-based resources such as soil and wood from local urban contexts (EX03, EX09, EX16). Urban scavenging involved reclaiming resources, building materials, and others from urban or industrial waste for recycling and upcycling (EX03, EX04, EX07, EX09, EX12, EX13, EX14). This was often organized in city-wide networks of waste collectors (EX04, EX07, EX12, EX13). In some cases, collectors go door-to-door to collect resources directly from households (EX04, EX13).

Building with bio-based Materials Some examples used locally harvested bio-based materials, such as Volontariat Homes (EX16) built mud houses from onsite soil or Buurman (EX03) using wood from local urban trees. Kibera Public Space Project (EX10) resolved flood prevention for the self-built neighborhood through landscape design (green infrastructure) without building any grey infrastructure.

Building with Secondary Materials and Leftovers Circular commoning often collected waste and leftover materials from industries (construction sites, factories, art, and event sectors) and redistributed salvaged and reclaimed materials to individual users (EX01, EX02, EX03, EX04, EX05, EX06, EX07, EX08, EX09, EX10, EX12, EX13, EX14, EX15, EX16). Processes became sinks for outflows from the upper part of the iceberg. De Ceudel (EX05) built a café from reclaimed materials from a nearby harbor and R-urban (EX15) built a neighborhood hub from reclaimed construction wood, doors, and windows. Through “concrete transplantation” in BlueCity (EX01), existing concrete partition walls were cut into blocks and reassembled as new walls within the building. Leftovers, such as short pieces of rebar, became a resource for new building components (EX06, EX13). Mineral leftovers, such as rubble and debris, have a long tradition of being reused e.g., as terrazzos. In Granby Four Streets (EX08), a temporary onsite workshop was installed to gather broken bricks, roofing slates, and other rubble to transform them into mantelpieces and doorknobs for the refurbished houses.

Building with Urban Waste Several processes repurposed or upcycled urban or industrial waste as building materials. In RUS Lima (EX14) that included old ropes, cables, tires, and car parts for a playground; while in Volontariat Home (EX16) bicycle wheel frames were used as window frames, and glass bottles as masonry in mud houses.

Relocation, dis- and Reassembly Some buildings were designed for temporary use to be easily dismantled, transported, and reassembled elsewhere (EX11, EX15). In De Ceuvel (EX05), houseboats were brought on land and refurbished as artists' studios.

Building Incremental, low-tech, and Experimental The building processes were carried out step by step, allowing for the spontaneous use of available materials. This enabled efficient use of resources, as well as learning and experimenting while building (EX01, EX08, EX10). In BlueCity (EX01), when window frames became available from a nearby school demolition, they were used to build separation walls in office spaces. Such component availability could not have been planned long-term. Experimenting with materials and unexplored techniques in prototypes and new products was an essential part of circular building (EX05, EX08). In Diseño, Informal (EX06), low-tech construction techniques were crucial for the easy replicability of prototypes. In Voluntariat Home (EX16) traditional building techniques were explored in contemporary contexts, such as in situ baking of mud houses.

Circular Use of Space

Other examples focused on using space in a circular or more efficient way, especially during the use phase of the built environment.

Preventing Demolition Several examples preserved existing structures and saved them from demolition (EX01, EX06, EX08, EX09). The start of Haus der Materialisierung (EX09) was an artist intervention that saved vacant modernist buildings from demolition and redevelopment. In Granby Four Streets (EX08), DIY urbanism and resident's activism saved the neighborhood from demolition.

Caring for Existing Spaces Communities repaired derelict buildings (EX01), entire neighborhoods (EX08), or refurbished self-built houses (EX06). In Ludoteca Merced (EX11), rebuilding a neighborhood after an earthquake was a community effort.

Sharing and temporary use Diverse people shared spaces, enhancing use by alternating activities (EX01, EX05, EX07, EX08, EX09, EX10, EX12, EX13, EX15). In Kibera Public Space Project (EX10), public spaces combined functions of flood prevention, social encounters, urban agriculture, and productive activities. Temporary use allowed the experimental use of spaces while awaiting redevelopment (EX05, EX09, EX15). In Eleonas Market (EX07), urban space was used efficiently around the clock by different users, industrial area during the week and transforming into a pop-up market on weekends.

Adaptive reuse The main structures of vacant buildings were preserved, but they were creatively repurposed (EX01, EX03, EX08, EX09, EX11, EX14). A former swimming pool was transformed into a circular production hub (EX01), and industrial spaces were adapted as circular hubs or resource centers (EX03, EX09). In some cases, entire buildings were repurposed. In De Ceuvel (EX05), houseboats became offices, and in Ludoteca Merced (EX11), a prototype for sustainable housing became a community center.

Activating and Regenerating Urban Wasteland Processes activated underused spaces, such as small vacant lots, neighborhood dumpsites, or post-industrial areas (EX05, EX07, EX08, EX10, EX15). In De Ceudel (EX05), the polluted soil of a former industrial shipyard site was regenerated through phytoremediation, and in RUS Lima (EX14) urban ruins were converted into a playground.

Creating Spaces for Circular Activities

Some examples created spaces to accommodate everyday circular activities, which have specific spatial requirements within urban contexts. These spaces needed to be located in central urban areas, where people and resource flows converge. However, accessing such spaces has often been challenging for less powerful groups (EX03, EX04, EX07, EX09, EX12, EX13). Transitioning to a circular society will require more spaces like this.

Creating Spaces for Local Production and R-activities Examples included everyday circular activities like urban agriculture, composting (EX10, EX15), rainwater collection (EX05, EX10, EX15), local renewable energy production (EX05, EX11, EX15), energy sharing (EX05), and water reuse with helophyte filters (EX05, EX15). Circular production hubs, circular workplaces, and open workshops offered spaces for small-scale manufacturing, repair, and remanufacturing (EX01, EX03, EX09, EX15). In Minalesh Tera (EX13), public street spaces were used as workshops for diverse upcycling activities.

Spaces for Redistributing Resources Citywide resource networks and urban mining activities needed spaces to store and redistribute collected resources (EX03, EX04, EX07, EX09, EX12, EX13). Baukarussel (EX02) redistributed materials directly onsite during disassembly. Second-hand building material markets redistributed salvaged construction materials (EX03, EX09), while recycling markets redistributed all kinds of salvaged objects (EX07, EX12, EX13). In Mercat Dels Encants (EX12) auctions have been a long-standing tradition for reselling complete households from clearances.

Spaces for Circular Skills, Knowledge and Lifestyles Spaces for sharing and learning circular skills were essential (EX01, EX03, EX05, EX09, EX13, EX15). Workshops and seminars taught people how to work with reclaimed wood or to repair objects (EX03, EX09, EX15). Others offered tours to explain their circular processes to the public (EX01, EX05, EX09). In Minalesh Tera (EX13) repair and upcycling activities in open public spaces made knowledge open source. Living labs (EX09) or architectural landmarks (EX12) helped to engage broader audiences in everyday circular activities.

Urban Resource Centers and Circular Neighborhood Hubs These integral spaces combined local production, redistribution, and skill-sharing activities (EX03, EX09, EX15). They actively involved ordinary people in circular practices and combined second-hand material markets, shared workshops, and social activities Fig. 13.

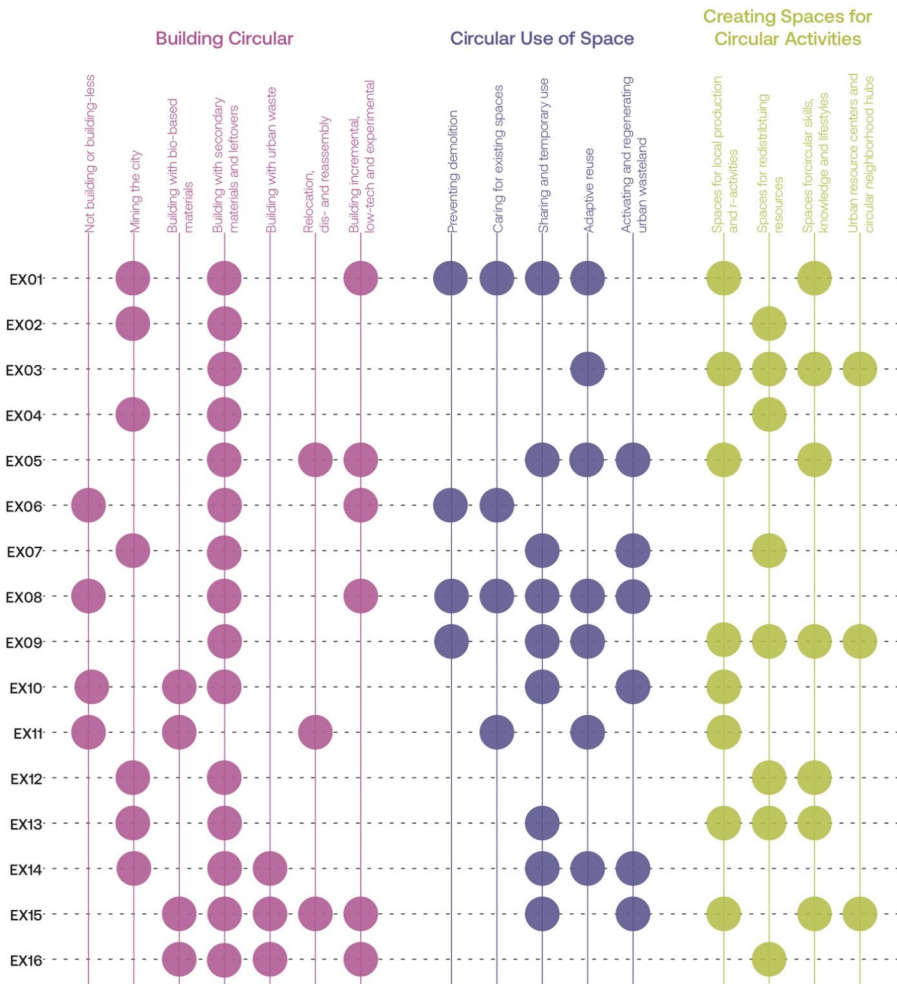


Fig. 13 Mapping the three forms of circular commoning as innate spatial tactics. The vertical axis represents the three forms of circular commoning and the role of the built environment: (1) building circular, (2) circular use of space, and (3) creating spaces for circular activities, along with their subcategories. The horizontal axis lists the 16 examples, and the circles indicate which forms of circular commoning are involved in each example (see Appendix C)

Discussion on Aspects of Circular Commoning as Innate Spatial Tactics

This paper explored how circular commoning can inform a broader transition to a circular built environment (CBE). Our literature and practice review delved into often-overlooked innate spatial tactics. In the following section, we discuss some key aspects of these processes.

Schumacher emphasizes the importance of understanding not only how we do things but also why [80]. Circular commoning processes are motivated either by a desire for change or by the necessity for it; circularity is seen either as a goal in itself or as a means to achieve

other objectives. The first group aimed for a broader circular transition, seeing themselves as catalysts to involve more people (EX01, EX05, EX09, EX15). Those were as before described “explicit” circular spaces, they acted as “real utopias,” turning utopian dreams into reality, as described by Wright [118] or concrete utopianism as described by Bloch [119]. In the second group, circular commoning was a means to generate income or address resource scarcity, often as survival economies for people to meet their basic needs. Urban resource networks, where waste has become a valuable resource for many people to make a living, illustrate this (EX04, EX07, EX12, EX13). Particularly for this group it is important to recognize innate spatial tactics as “an art of the weak” struggling with power imbalances and for recognition [58]. In practice, desire-driven and survival-driven motivations are often intertwined. For instance, at De Ceudel (EX05), artists created circular workspaces driven by both the need for affordable spaces in the city and a desire for circular futures. Some desire-driven practices might argue that transitioning to more sustainable lifestyles is crucial for human survival on the planet. Further research could explore individual motivations for engaging in circular commoning practices.

In modern cities, it is not possible to be circular on an individual basis—gathering diverse human energies leads to higher circularity. Circularity requires systems where diverse people collaborate, making one’s waste another’s resource. Especially higher R-strategies such as refusing, rethinking, and sharing require collaboration between diverse people beyond individual household recycling or consumption of circular products [62, 120]. Circular commoning processes benefit from diverse collaborators to join skills, knowledge, and labor beyond professional boundaries, creating “resilience through diversity” (EX06, EX08, EX09, EX10, EX15). Sennett calls working together with people who are different from oneself “complex collaboration” [96]. When such collaborations are effective, fewer resources are consumed [121]. In Volontariat Homes (EX16), houses were built with minimal purchased materials, leveraging local labor, smart architectural design, and artisanal knowledge. Additionally, circular commoning processes bridge gaps between industry and ordinary people, the upper and the lower part of the iceberg - becoming “sinks” for resource outflows from the upper part of the iceberg, as proposed by Lekan [74] (EX03, EX09). However, communication and power imbalances between diverse actors remain barriers in these processes.

“Making do” revalues resources, spaces, and human roles that have been previously devalued. In a linear system, when resources are no longer needed, they lose value and become waste. Circular commoning processes rethink value paradigms, eliminating the concept of waste. De Certeau and later Lacton discussed “making do”—it emerged in the practice review as a key spatial tactic, with people creatively reimagining existing resources as valuable [58, 86]. Responding to the idea of a sink [74], leftover materials that were too small for industry became valuable building materials for communities (EX03, EX06, EX13). Revaluing unused spaces, such as the abandoned waterpark of BlueCity (EX01), can be challenging. The commons view waste as nonexistent since there is no property [53]. Literature discussed how historically, the commons have often been regarded as a wasteland (*res nullius*), a place having no owner and hence no value. When resources are devalued as “waste,” related social roles are often devalued, such as waste pickers, sorters, and recyclers [122]. Devalued resources and related social roles, such as waste pickers, could become interesting starting points for circular commoning. Research is needed on changing social roles in revaluing resources through “making do” tactics.

Lee [79] suggests seeing community economies not as insignificant remnants of the mainstream economy but as additional *spaces of possibilities* to instigate change in the mainstream. They can be found in the gaps and margins of mainstream and can provide opportunities for transformation and hope. Spaces of possibilities for innate spatial tactics could be social, legal, physical, or other undefined zones that trigger reimagination and different approaches. Spaces of possibilities on the resource dimension could be urban waste, vacant buildings, and urban wastelands (EX10, EX14, EX15) or locally harvested bio-based materials (EX16). Unowned (*res nullius*) and unwanted (waste) resources offer creative revaluation possibilities (EX08, EX10, EX13, EX15). Other spaces of possibilities were creative forms of ownership or non-ownership, such as temporary use agreements or community land trusts, often encouraging efficient and experimental use (EX03, EX05, EX07, EX08, EX09, EX13, EX15). In the people's dimension, spaces of possibilities included artists seeking spaces (EX09), residents fighting eviction (EX08), or self-organized waste collectors (EX04, EX07, EX12, EX13). Times of economic or social crises often opened these spaces of possibilities (EX05, EX07, EX09).

Innate spatial tactics transcended multiple spatial and temporal scales of the built environment, echoing the CBE as a system designed for closing resource loops at different spatial-temporal levels. Circular commoning emphasized the long-term engagement of ordinary people with resources. Spatial professionals often focus on the design and construction stages [8], but circular commoning processes focus on maintenance, repair, reuse, and repurposing over time. Spatial professionals capacitated communities for “circular self-management” (EX05, EX10, EX15). In terms of scale, circular commoning can go beyond local, for example, along the lifecycle of a material. However, the neighborhood seems essential for complex collaboration and local sharing.

In the practice review we saw diverse forms of communities, involving affectual socio-material relations between people, resources and non-humans. The initial notion of community in this paper was “being-in-common” [113]. In De Ceudel (EX05) boundaries between resources and people blurred, with nonhuman actors becoming community members in some cases. In Granby Four Streets (EX08) attachment and affection for the built environment played a role. Some groups were “in common” by doing together, for example, in Volontariat Home (EX16) building with local materials or in Haus der Materialisierung (EX09) exchanging cared-for resources.

Innate spatial tactics within capitalist realities struggle for recognition and survival, underlining tensions between the upper and lower part of the iceberg. Circular commoning often operates outside regulatory frameworks, within informalities and self-defined rules. Although the upper and lower part of the iceberg are intertwined, tensions arise from power imbalances—coming back to spatial tactics as an “art of the weak” [58, 76]. For example, informal recycling markets in inner-city areas face constant eviction threats (EX04, EX07, EX12, EX13). Access to central urban spaces was essential for circular commoning, yet high costs and specific spatial demands posed challenges (EX01, DE, EX09, EX13). People in circular commoning practices often experience precarity, engaging in unpaid or low-paid labor. Action research can play an important part here by shedding light on these practices to empower them as important catalysts of systemic change.

Schumacher [80] emphasizes that there lies wisdom in smallness and that small-scale practices are always more sustainable, as their impact is usually minimal compared to nature's ability to recover. In addition, people will take better care of their local land and

resources than anonymous institutions. This goes along with discussed scholars such as Rudofsky [77] and Turner [78] who pointed out the valuable knowledge in self-building techniques that was developed in local contexts. However, the question remains of what impact small-scale practices such as circular commoning have in a world where climate change and resource exploitation are moving quickly forward on a large scale—pointing to the theoretical discussion of real utopias or concrete utopias [118, 119]. First, circular commoning offers additional benefits beyond closing resource loops. People find meaning, a sense of belonging, and affection for other people, resources, and the environment. Second, real-life experiments provide valuable knowledge for broader societal transition. Third, circular commoning practices create new narratives and rituals, making circularity relatable and livable rather than abstract future plans. This brings hope that other futures are pragmatically possible.

Conclusion

This study has revealed significant links and mutual complementarity between circularity and commoning in the production of the built environment. We have identified numerous empirical examples of circular commoning as innate spatial tactics, demonstrating how these complex social processes enable sustainable management of shared resources.

The literature review revealed many commonalities and synergies between the theories of circularity and the commons. These theories represent innate spatial tactics through which ordinary people sustainably manage resources in the built environment. The theory of the commons enriches circular models by adding social and local perspectives, while circular models provide commoning practices with clear strategies for sustainable resource use. We proposed a conceptual framework of circular commoning with three dimensions: resources, people, and governance. In a review of practices, we examined 16 examples of circular commoning from cities worldwide, predominantly found on fringes and in opposition to mainstream urban development, including counter-communities, activist groups, and urban informalities. Social roles within these practices were dynamic, often blurring lines between users and professionals and even between human and nonhuman actors. The neighborhood emerged as a particularly relevant scale. We identified three forms of circular commoning in spatial production: building circularly, circular use of space, and creating spaces for circular activities.

Throughout this article, we emphasized the potential learnings that empirical examples of circular commoning can offer for a socially just transition toward a CBE. Such insights can foster more nuanced visions of a CBE in line with circular society concepts, considering broader aspects of environmental and social sustainability, justice, and a sense of community and solidarity. Unless strategies for transitioning to a CBE consider social and local aspects, progress may be slow and could even negatively impact certain groups. Innate spatial tactics can provide valuable learnings on these aspects. Future studies could apply the proposed three-dimensional framework to explore changing social roles; forms of collaboration, skills, knowledge, democracy, and social justice in the people dimension; types of resources, technologies, and spatial requirements in the resource dimension; and strategies for sustainable self-organization and amplification (often called scaling-up) in the governance dimension. Action research can identify and disseminate patterns of effective

practices, providing inspiration and practical guidance for similar initiatives while acknowledging each context's unique characteristics—remembering that “each commons is one of a kind!”

Furthermore, it is essential to recognize and valorize innate spatial tactics and create safe spaces for them and future ones to exist. Circular commoning practices, despite their potential, are often marginalized as niche or idealistic solutions and face significant struggles for survival within current frameworks. There are significant tensions between top-down and bottom-up ambitions for circular transitions. On the one hand, top-down strategies struggle with broader implementation, among others, due to ignorance of social and local dimensions. On the other hand, numerous self-organized circular initiatives battle for recognition and survival. Therefore, exploring new methodologies that can validate and support circular commons without compromising their integrity is imperative. Strategies focusing on grassroots transitions, social movements, and network approaches could offer promising avenues for bridging the gap between theoretical visions and enacted realities in the transition toward a CBE.

By reviewing circular narratives from theory and practice, we demonstrated that these are not merely distant utopian ideals but are actively performed on a day-to-day basis as innate spatial tactics. Abstract global issues such as climate change have become more relatable on a local scale and in everyday life. These narratives affirm that CBE is not only an abstract imagined future but that tangible change is within our reach. Bringing these examples to light and learning from them is important for inspiring and encouraging others and negotiating safer spaces for their own existences, which are often contested and under pressure within current realities. Showing that “something can be done” provides a hopeful stance. It is about doing what we can in the here and now. Maintaining a hopeful stance is essential for driving the broader transition toward a CBE as part of circular society concepts because, as Wright [118] emphasizes, “What is pragmatically possible is not fixed independently of our imaginations - but itself shaped by our visions”.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s43615-024-00473-4>.

Acknowledgements The authors would like to thank the anonymous reviewers for their insightful and constructive feedback, which greatly contributed to improving this article.

Author Contributions All the authors contributed to the study's conception and design. Literature and practice review, data collection, and analyses were performed by Tamara Egger. The first draft of the manuscript was written by Tamara Egger, and all the authors commented on previous versions of the manuscript. All the authors have read and approved the final manuscript. Supervision was provided by Machiel van Dorst, Olga Ioannou, and Alexandra den Heijer.

Funding This article constitutes part of a PhD study funded by the Faculty of Architecture and the Built Environment, TU Delft.

Data Availability Not applicable.

Declarations

Ethics Approval and Consent to Participate Not applicable.

Consent for Publication Not applicable.

Competing Interests The authors declare no competing interests.

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