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ANALYSIS

Identifying leverage points in the social housing system: Housing associations on the path towards degrowth?

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ABSTRACT

Conceived as a publicly-funded means of providing affordable, secure homes, social housing has historically been integral to growth-driven economies. With the gradual retrenchment of welfare policies, the sector continues facing mounting tensions between market imperatives and its social mission—challenges further compounded by the climate crisis. Degrowth proposes an emancipation from a growth-oriented system to reconcile socio-ecological goals; however, the compatibility of a degrowth agenda with that of social housing providers is underexplored. We investigated social housing providers' perceptions of the interventions needed to address the system structures that undermine social housing management and provision—such as declining housing quality, demolition, disinvestment in physical and social infrastructure, and lack of tenant representation—and explored their potential to catalyse the transformational change envisioned by degrowth. In a workshop with representatives of four London-based housing associations, we used participatory system dynamics (SD) to identify systemic interventions, and discuss their feasibility, impact, and implementation barriers. We then bridged systems thinking and degrowth frameworks to explore the kinds of transformation these interventions may enact, and their synergies with approaches to creating degrowth-oriented value. Approaches such as 'Equalising inequalities' and 'Shrinking, slowing, and extending resource cycles' were more frequently linked to interventions at shallower leverage points in the system. Conversely, most interventions associated with 'Democratic, purpose-driven, and transparent governance' and 'Overcoming economic growth dynamics' targeted the deepest type of leverage points in the system. Our findings demonstrate the value of SD in helping stakeholders formulate interventions addressing symptoms and root causes of systemic issues arising from growth-oriented structures, offering guidance for future research and practice.

1. Introduction

The provision of social housing lends itself to reflections on a world beyond economic growth. In the UK, social housing was originally devised as a model for providing adequate and affordable homes through philanthropic and government support (Tunstall, 2020). As a key pillar of the welfare state, the sector has historically been reliant on a growth-dependent economic model, aimed at delivering 'greater equality within capitalism' (Büchs, 2021; Hirvilammi and Koch, 2020, p. 1). This dependence was further exacerbated by the neoliberal turn in the 1980s, when housing in the UK became a major engine of economic expansion (Kohl and Spielau, 2022), leading to market-driven policies promoting the marketisation and privatisation of social housing provision (Malpass and Victory, 2010). While the political push for home ownership encouraged tenants to purchase their homes, funding cuts and borrowing caps limited the construction and upkeep of social housing estates by the public sector (i.e., Local Authorities, LAs; Maclennan and Gibb, 1990), resulting in a decrease in both the real number and the share of social homes (from 31 % of the total housing stock in 1979 to only 16 % in 2022; Cromarty and Barton, 2024). For

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their ability to operate at scale between the state and the market, not-for-profit Housing Associations (HAs) rapidly became the main providers and managers of social homes, growing their stock via transfers from LAs and with new build financed by private funding (Manzi and Morrison, 2018). Despite their initial success, stringent austerity measures, changing policies and standards (climate, safety and quality), and other external financial pressures have been increasingly affecting HAs' ability to maintain, repair, and build social homes (Baker et al., 2022; LUHCC, 2022; Zhou et al., 2022). In parallel, the emphasis of national planning policies on the economic viability of social housing developments has exacerbated the need for efficiency savings mechanisms (cost-saving and operational streamlining measures) and the reliance on commercial activities (selling and renting housing at market rates) to subsidise core services (maintenance, construction; Manzi and Morrison, 2018; Mullins, 2010). Cross-subsidy mechanisms have largely been criticised for encouraging the demolition and redevelopment of social housing estates, with detrimental impacts on residents and the environment (Crawford et al., 2014; Hubbard and Lees, 2018; Watt, 2021). These negative effects have been amplified by the profit-driven and viability-oriented negotiations between developers and Local Planning Authorities (Section 106 of the 1990 Town and Country Planning Act), often resulting in a reduction in developers' obligatory contributions towards infrastructure and affordable housing (Lord et al., 2019; zu Ermgassen et al., 2022).

As of today, tensions between HAs' social purpose, environmental targets, financial viability, and growth (in organisation size, housing targets, land values, profit) are reaching an unsustainable point—with recent data reporting spiking homelessness rates, cases of disrepair and maladministration, and residents' illness and death (Baker et al., 2022; DLUHC, 2020, 2024a).

Against this setting, 'degrowth' has emerged in social movements and academic discourses as a framework, strategy, and policy agenda proposing an emancipation from the hegemony of growth to prioritise good quality of life for all, while enhancing ecological conditions (Barlow et al., 2022; Demaria et al., 2013; Fitzpatrick et al., 2022; Hickel, 2021; Kallis, 2011, 2018). In the housing context, a degrowth agenda aims to address the irreconcilable tension between the commodification of housing provision and its role in meeting basic human needs within planetary boundaries (Nelson, 2018; Savini, 2021; Schneider, 2018).

For this purpose, housing degrowth has largely focused on small-scale alternative housing and property rights (e.g., co-housing, eco-villages, rural-urban squats; Baumann et al., 2020; Chatterton, 2013; Hurlin, 2018; Nelson and Chatterton, 2022; Savini and Bossuyt, 2022; Weiss and Cattaneo, 2017). As the body of literature expands, scholars have argued for the need to include existing housing in the debate, and in particular housing "at the margins of the market" (i.e. social housing), whose provision has so far been governed by development-driven strategies privileging economic valuation (Ferreri, 2018, pp. 110, 116; Tunstall, 2023). In this context, developing alternatives to the "omnipresent" growth narratives requires engaging all actors involved in the management and delivery of social housing (Schneider, 2018, p. 15); however, on the assumption that the "ability or willingness of politicians or business to lead a degrowth transition is scarce-to-non existent," housing degrowth research has predominantly targeted community-led action (Baumann et al., 2020, p. 252).

Thus, compatibility between housing degrowth and the goals of social housing providers, as well as the potential for degrowth to address systemic shortcomings in the social housing sector specifically, have been insufficiently investigated.

This paper investigates the alignment between the perception of HAs of how to address key issues in the provision and management of social housing and a degrowth agenda. We focus on England, and particularly on London, where house prices, population influx, investment pressure, and welfare austerity are among the most acute in the UK (Barford and Gray, 2022; Dorling, 2014; Edwards, 2016; Gallent et al., 2017). In this context, we introduce the results of participatory system dynamics activities aimed at identifying possible interventions in the English social housing system. We then use systems thinking and degrowth frameworks to explore the potential of the proposed interventions to channel the transformational change envisioned by degrowth.

The remainder of the paper is structured as follows. **Section 2** briefly introduces the systems thinking and degrowth frameworks used in this study. Because of their emphasis on systemic transformation, limits to growth, and the prioritisation of social and ecological well-being over economic expansion, these frameworks are central to the field of ecological economics. **Section 3** outlines the methods adopted to identify key issues in the social housing system, to formulate possible systemic interventions, and to evaluate their potential to effect change and create degrowth-oriented value. **Section 4** provides an overview of four system diagrams (i.e. causal loop diagrams) and the interventions proposed by workshop participants. **Section 5** introduces possible linkages between interventions, the system characteristics they target, and approaches to creating degrowth-oriented value. Finally, **Section 6** discusses the significance of our findings, and outlines key limitations and possible research pathways.

2. Bridging frameworks: degrowth and systems thinking

Below we describe the frameworks we used to explore the potential of a set of interventions in the social housing system to catalyse the transformational change of a degrowth agenda—namely Froese et al. (2023) framework, which introduces different approaches in which organisations create degrowth-oriented value, and the framework of Meadows (1999) and Abson et al. (2017), which identify places to intervene in a system for leveraging change.

2.1. Creating degrowth-oriented value

A degrowth agenda aims to address tensions between the widespread capitalist value creation logics currently embraced and reproduced by most organisations—i.e., economic efficiency, accumulation, and growth—in favour of degrowth values such as ecological sustainability, equality, and conviviality and participation (Froese et al., 2023; Pansera and Fressoli, 2021). A greater understanding of how value is defined and created is thus key to achieve the deep socio-economic transformational goals envisioned by degrowth (Demaria et al., 2013; Kallis, 2018; Khmara and Kronenberg, 2018; Mair et al., 2022; Nesterova, 2020).

The attribution of *value* to activities and their implications depends on how important these are for a person or group (i.e., their *values*, or what is good, proper, and desirable; Froese et al., 2023; Graeber, 2013).

Froese et al. (2023) investigated how organisations engage in degrowth-oriented value creation, understood as the activities and their implications that contextually convey degrowth values (Dembek et al., 2023; Gollnhofer et al., 2019; Graeber, 2013). Based on an integrative and systematic literature review of degrowth-oriented organisations, they extracted thirty-nine 'degrowth-oriented organisational value creation patterns'—i.e., 'solutions' to problems that can potentially be applied in a variety of contexts—, which they organised into seven main groups (Table 1): Overcoming economic growth dynamics; Engaging consumers in sufficiency-oriented prosumption; Joining forces in rewarding and mutual collaboration; Equalising inequalities; Open and decentral creativity; Shrinking, slowing, and extending resource cycle; Democratic, purpose-driven, and transparent governance.

Despite the usefulness of the framework for identifying and devising strategies aligned with a degrowth agenda, there is currently limited knowledge about the systemic and transformational potential of the proposed approaches to generate degrowth-oriented value, as well as about their interdependence.

Table 1
Degrowth-oriented organisational value creation patterns groups (Froese et al., 2023, p. 8) and examples for the social housing sector (Source: authors).

Groups	Value creation patterns	*Examples for the social housing sector*
Overcoming economic growth dynamics	Real cost pricing Investing in efficiency gains without growth motives Balancing the organisational scale Interlocking multiple parties' statutes for a purpose Marketing a specialisation in sustainability Building personal customer relationships Using alternative and sustainability-oriented currencies	*Decoupling social housing provision from cross-subsidy, growth-driven strategies*
Engaging consumers in sufficiency-oriented prosumption	Sharing risks and responsibilities with consumers Supporting co-production and prosumption Engaging consumers in packaging reuse Promoting sustainability-oriented learning and engagement Communicating for sufficiency	*Involving residents in management and decision-making*
Joining forces in rewarding and mutual collaboration	Practicing a culture of reciprocal care Doing business in local actor networks Engaging in values-based business relations Distributing through a cooperative sales network Joining forces in mission-driven networks	*Developing local infrastructures for community organisation and support*
Equalising inequalities	Redistributing profits Cross-subsidising Mobilising non-market resources and support Paying uniform, fair, and needs-oriented salaries Tailoring offers for disadvantaged groups	*Providing high-quality housing independent of tenure*
Open and decentral creativity	Sharing and developing knowledge openly Utilising commons-based licences Offering convivial products	*Leveraging resident's knowledge on social housing challenges, sharing knowledge across communities*
Shrinking, slowing, and extending resource cycles	Providing demand-reduction services Providing products as a service Providing services for shared product use Providing repair services Upcycling Promoting second-hand and reuse Collecting and salvaging used products Creating circular products Utilising traditional and eco-friendly means of production	*Prioritising maintenance and repair to new build*
Democratic, purpose-driven, and transparent governance	Accounting transparently and purpose-oriented Practicing democratic and inclusive governance Governing with stakeholder representatives Purpose-driven funding and co-ownership Setting and communicating a common purpose	*Cooperative forms of housing provision*

2.2. Leveraging change

Participatory system dynamics (SD) is a well-established approach to collaboratively identifying the structure and dynamics underlying a given problem, and to reflect upon possible actions (i.e., interventions) and their effectiveness at substantive change in the system (i.e., leverage; Vennix et al., 1996; Voinov and Bousquet, 2010; see e.g., Egerer et al., 2021; Videira et al., 2014). Meadows (1999) proposed a hierarchy of twelve 'leverage points', places in complex systems where a small change can produce a range of systemic transformations. Abson et al. (2017) aggregated the twelve points into four system characteristics that can be targeted by increasingly influential interventions: parameters, feedback, design, and intent (Fig. 1).

Shallow (or low) leverage points are those places where interventions are potentially easy to implement, but have limited transformative potential (parameters, feedback; e.g., taxes); conversely, deep (or high) leverage points are often more difficult to enact, but more likely to bring about transformational change (design, intent; e.g., new governance structures; Fischer and Riechers, 2019).

A leverage points perspective can offer insights into the potential of interventions and their interactions to effect change; furthermore, leverage points can be used as methodological boundary objects offering an interface between academic work and practice (Fischer and Riechers, 2019).

In the remainder of the paper, we build a theoretical bridge between the systems thinking and degrowth frameworks introduced in this

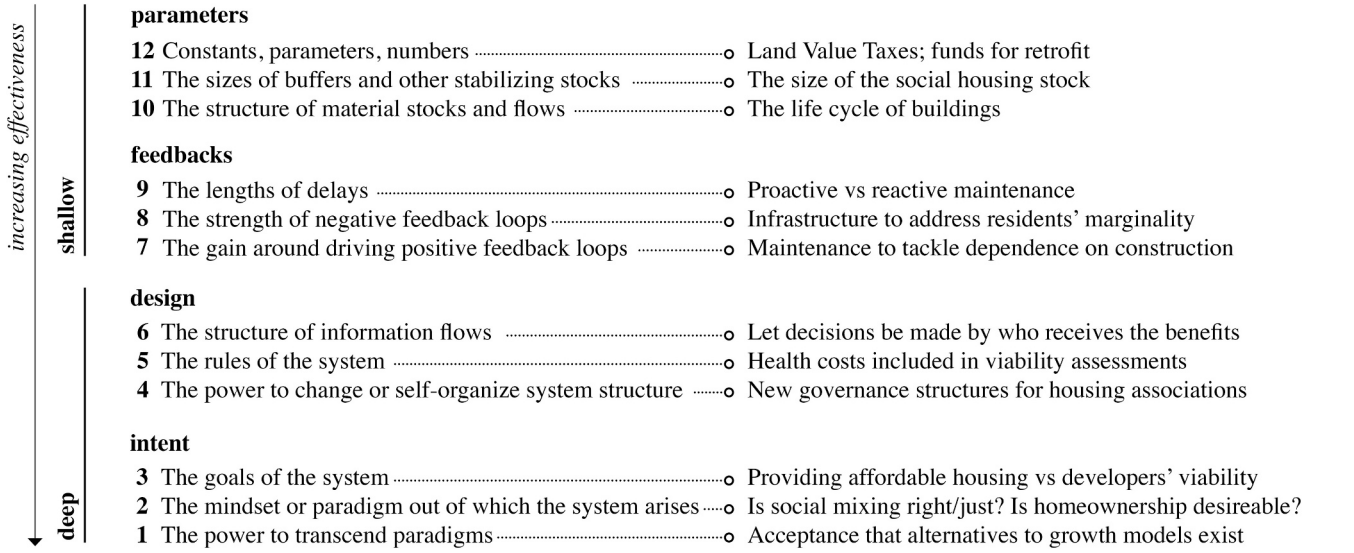

Fig. 1. The four system characteristics of Abson et al. (2017), their relationships to the twelve leverage points of Meadows (1999), and examples for the English social housing sector. Source: authors.

section to study the transformative and degrowth-oriented potential of a set of interventions elicited in participatory SD workshops.

3. Methods

Our empirical investigation consisted of three steps, namely (i) outlining the system structures undermining the management and provision of social housing in England and London; (ii) identifying interventions in the system; and (iii) exploring their potential to effect change in the system and their synergies with approaches to creating degrowth-oriented value. Each step is detailed in the following subsections.

3.1. Outlining system structures: boundary setting

Our analyses built on findings reported in a previous study, which mapped the system structures affecting the provision of social homes in England, focusing on London-based HAs (Pagani et al., 2025).

The study introduced six causal loop diagrams (CLDs), based on literature review and participatory activities involving three large and one medium-sized HAs, as well as the authors of the selected publications. The CLDs helped identify and visualise participants' understanding and hypotheses of the complex system structures (variables, interrelations, and feedback loops) that underpin systems behaviours—such as reducing stock of social homes, decreasing quality of existing social housing estates, growing disconnection between tenants and management, demolition, and gentrification processes (ibid).

Although the six CLDs offered fertile ground for the identification of systemic interventions, their level of richness and complexity posed obstacles to the involvement of stakeholders unfamiliar with SD. We thus used the database of variables and links of the six CLDs to produce four smaller diagrams. We first identified instances of policy resistance and counterintuitive system dynamics from the six diagrams and the participant discussions that underpinned them—for instance, the reliance on construction to maintain the existing housing stock (an example of the 'shifting the burden' archetype; Senge, 1990). We then defined new system boundaries around a limited set of variables and interrelationships, capturing key dynamics while achieving an understandable, manageable, and coherent unit. The resulting smaller CLDs, outlined in the present study, focus on four themes running across the original diagrams, namely (i) maintenance and repair, (ii) demolition, (iii) physical and social infrastructure, and (iv) tenant representation. To trigger discussions around possible interventions, we formulated one question for each of the four diagrams and highlighted, in bold, the key variables they addressed.

3.2. Identifying interventions in the system

We organised a workshop in response to the interest expressed by HA participants to discuss possible solutions to the issues identified during the previous research phase. Nine HA members of staff participated, seven of whom had taken part in the development of the original large CLDs. Participants were originally selected by the HAs based on their expertise around the issues addressed (Pagani et al., 2025); their roles encompassed regeneration, strategy, lettings and sales, planning, and communities (identified in quotes as REG, STRA, LESA, PLA, COM, respectively).

The workshop script was adapted from Scriptapedia "Places To Intervene" (Hovmand et al., 2011), and consisted of the following stages[2]:

1. *Presentation by the principal investigator*, comprising an overview of the six CLDs developed in the first workshop, the four smaller CLDs, and examples of the twelve leverage points of Meadows (1999; Fig. 1).

2. *Identification of interventions*, which consisted of two rounds of discussion on possible places to intervene in the system. The four CLDs were split into two tables with two moderators each (Table 1 = maintenance and repair, demolition; Table 2 = social and physical infrastructure, tenant representation). Participants could choose which table to join for each round, based on their expertise and interest. After an introduction of the CLD, participants were prompted by the guiding questions to individually brainstorm on possible interventions, which they summarised using sticky notes. They were then asked to share with the group one intervention at a time, and, following a discussion with the participants at the table, point the place in the CLD affected by the proposed intervention, labelled by a number. The sticky note was then

[2] Scriptapedia is an online handbook listing scripts for group model building. The script is available at https://en.wikibooks.org/wiki/Scriptapedia/Places_To_Intervene. Accessed on 28.06.2024.

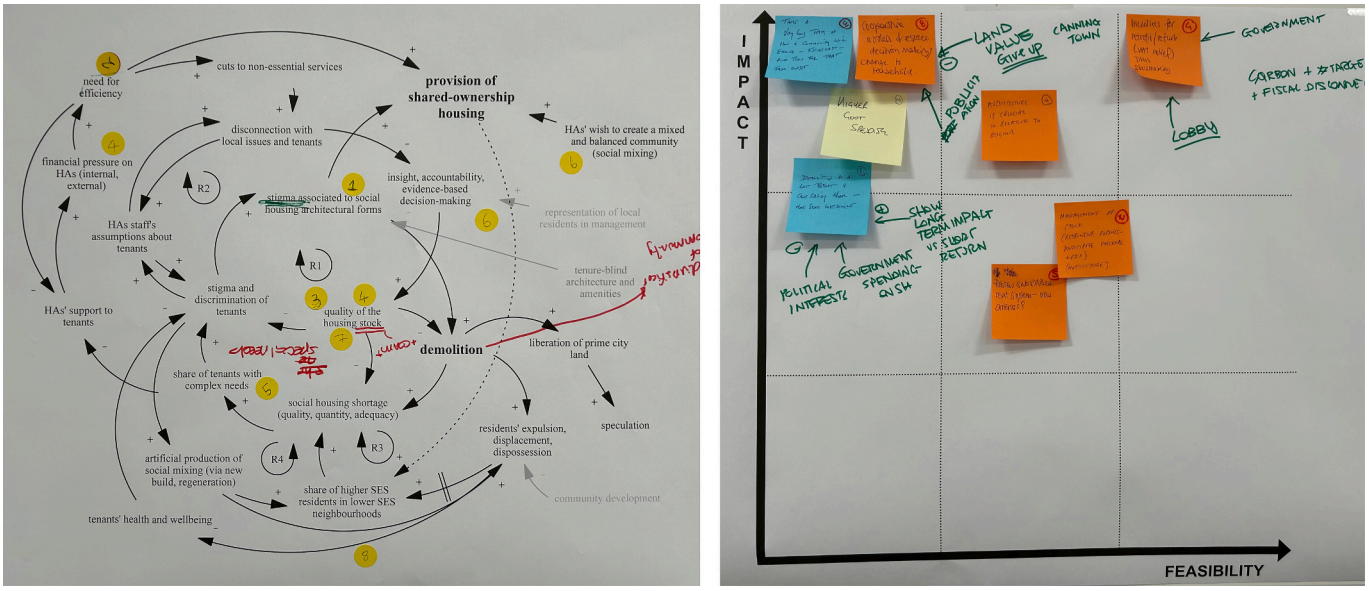

Fig. 2. CLD 2, workshop results. On the left, the numbered dot stickers indicate the variables affected by the intervention. On the right, sticky notes describe interventions and their impact and feasibility. Notes on the chart indicate possible factors enabling or hindering the implementation of the interventions.

placed in a chart according to its perceived feasibility and impact (low, medium, high). When two or more interventions acted on the same places, they were assigned the same number (Fig. 2). Since participants were not introduced to the degrowth agenda, they were free to formulate interventions based solely on their understanding of the CLDs and their normative stance.

3. *Discussion on implementation*, which aimed to elicit barriers and opportunities to the implementation of some of the proposed interventions (as many as possible within the time limit). The session involved one researcher and two to three participants per diagram. Prompt questions targeted the most impactful but less feasible policies (e.g., "how to make it more feasible?"), or the most feasible ones (e.g., "if it's feasible, why hasn't it been implemented?").

The material collected at the end of the workshop included recordings and transcripts, four CLDs with numbered dot stickers and the associated feasibility/impact charts with sticky notes (Fig. 2), anonymous feedback questionnaires, and signed consent forms.

In the analysis, the sticky notes and charts were used to generate figures (Fig. 3 - Fig. 6) displaying possible interventions in the system, their degree of feasibility (using different colour shades) and their impact (using different line thicknesses). Overlapping interventions (i.e., when notes were stuck together) were merged into one variable; for instance, "local ballot", "resident boards", "involve the young people" and other five interventions were grouped under "diversity, involvement, and power of residents in HA decision-making." Recordings were used to clarify the meaning of some interventions and reformulate their naming, to summarise the key factors supporting or hindering the implementation of selected interventions, and to extrapolate associated quotes. During the discussion, participants suggested additional amendments to the CLDs, which we highlighted in the diagrams.

3.3. Exploring the transformative power of interventions towards degrowth

Following the workshop, the authors used the frameworks of Meadows (1999), Abson et al. (2017), and Froese et al. (2023) to explore links between the proposed interventions, the leverage points and system characteristics they targeted (Fig. 1), and approaches to creating degrowth-oriented value (Table 1). This exploration was informed by each author's positionality, thus requiring trade-offs between different understandings of the possible transformational effects of interventions and their alignment with degrowth. The first and second authors independently identified links based on their expertise in systems thinking, housing, and the construction industry. They then compared and discussed the results of their findings, referring to audio recordings whenever ambiguity arose, to ensure that participants' understandings of the interventions were accurately captured. Finally, two internal workshops were organised with the other authors to discuss the links on which agreement was not found. For instance, while some researchers perceived 'tenure-blind architecture and amenities' as a catalyst for changing mindsets about who deserves what type of housing, others viewed it as a strategy to hide differences when equity is not a primary system goal.

When linking interventions to leverage points, we focused on the 'deepest' ones, which "shape and constrain interventions deemed possible at more shallow levels of leverage" (Fischer and Riechers, 2019, p. 118); when the researchers perceived that an intervention could, depending on its implementation, target shallow *or* (rather than *and*) deep leverage points, we reported both. Leverage points were then linked to the system characteristic they affect (Fig. 1). As for the degrowth framework, we used workshop recordings and transcripts to assign the approaches to degrowth-oriented value creation that we deemed the closest to the context within which participants had formulated the interventions.

Results were organised in a table, ranking approaches to degrowth-oriented value creation according to their increasing share of transformative interventions, and interventions according to their increasing level of effectiveness (Table 2).

4. Intervening in the system

In the following, we introduce the four CLDs presented at the workshop. For each CLD, we outline the systemic interventions that participants formulated, and the factors perceived as hindering or supporting their implementation. Variable names are highlighted in text using *italic* font (e.g., *social housing shortage*). **Bold** is used to identify reinforcing and balancing feedback loops (**R1**, **B1**) and the possible system characteristics addressed by the interventions (**parameters**,

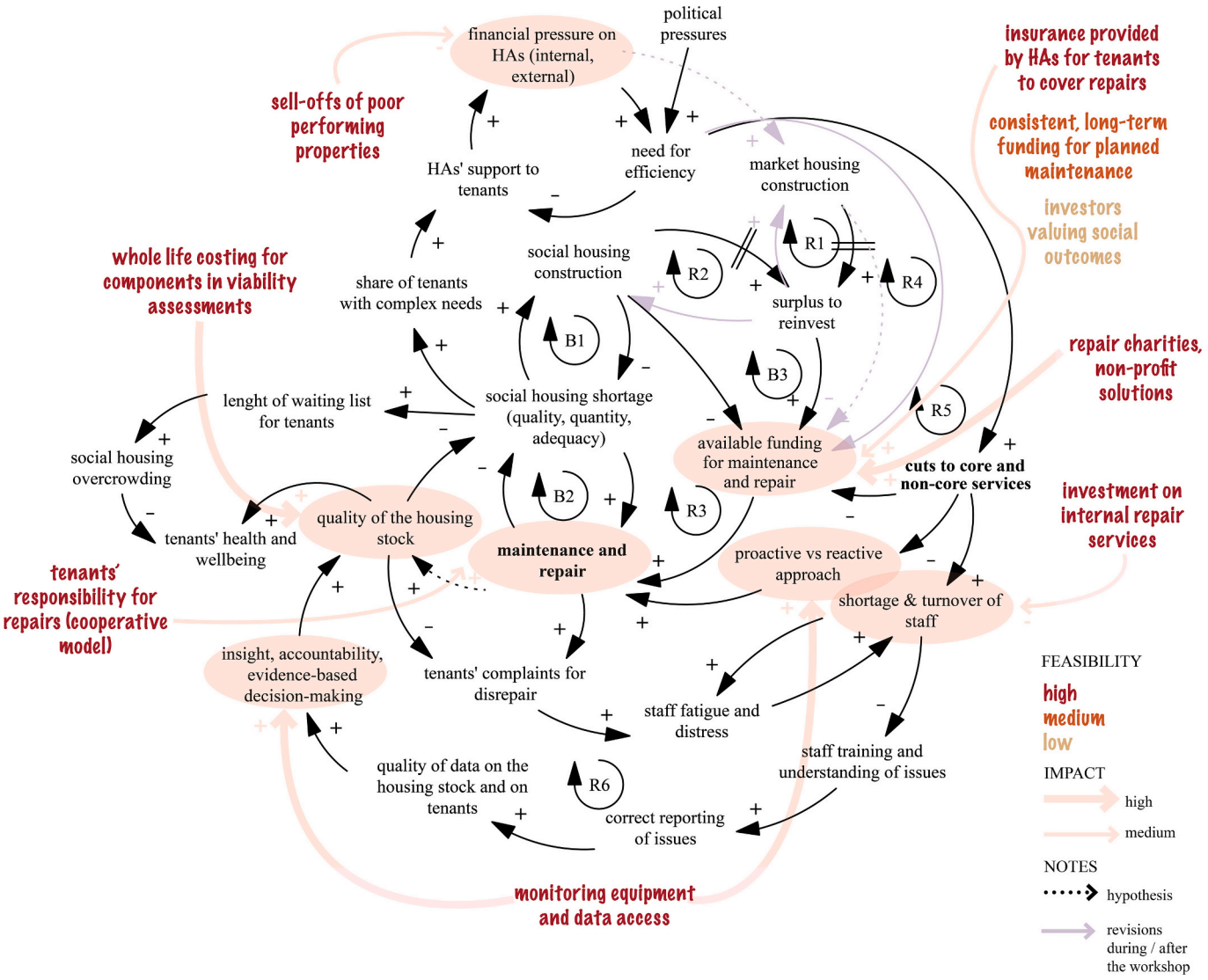

Fig. 3. CLD 1. What are alternative ways to reacting to cuts? A positive (+) polarity indicates that an increase (decrease) in the cause variable will result, ceteris paribus, in an increase (decrease) in the effect variable, relative to the value it would otherwise have taken. A negative (−) polarity will lead to the opposite effect. R: reinforcing loop; B: balancing loop. Hash marks: delay. Bold: issue highlighted at the workshop. Only key loops are shown.

feedback, **design**, **intent**; see Table 2).

4.1. On maintenance and repair

Fig. 3 illustrates the causal narrative linking *financial* and *political pressures*, and the consequent funding cuts (*need for efficiency*), to elements central for the healthy functioning of the system, i.e., housing (*available funding for maintenance and repair*), management (*proactive* vs *reactive approach* to issues), and staff (*shortage & turnover of staff*).[3] The cause-and-effect chains described by the CLD negatively impact the *maintenance and repair* of the social housing stock and the *insights, accountability, evidence-based decision making* of HAs, affecting housing *quality* and compounding the *financial pressure* (**R4, R5, R6**). Within this landscape, the *construction* of social and market homes generates (via rent and sale) *surplus to reinvest* in *maintenance and repair* and in further *construction* (**R1**, **R2**), both of which balance the *social housing shortage* (**B1**, **B2**, **B3**). However, new build parallelly drains resources for the upkeep of the existing stock, generating a dependence on construction to maintain and repair (**R3**).

4.1.1. Interventions: What are alternative ways to reacting to cuts?

To address the impact of cuts (on housing, management, and staff) and improve the quality of the housing stock, HA participants identified interventions predominantly concerned with redistributing agency and responsibility across the system (to internal services, non-profits, residents, investors, technology). This translated into measures acting on system **parameters** (e.g., a greater *investment on internal repair services*) and **feedbacks** (e.g., *monitoring equipment* supporting decision-making and action). At a deeper level, it can imply a **redesign** of the system rules and power, e.g., through a *whole life costing for components in viability assessments*, or the possibility for tenants to perform housing repairs [*tenants' responsibility for repairs; insurance provided by HAs for tenants to cover repairs*], respectively:

[3] In the CLD presented at the workshop, the variable *cuts to core and 'non-core' services* was named *cuts to non-essential services*. However, as clarified by a workshop participant, maintenance and repair are essential or *core* business activities, which have also been affected by austerity measures (Manzi and Morrison, 2018).

People […] put money into the cooperatives, and then […] it's your responsibility. The system intervenes by providing you a home but after that the responsibility is yours. (COM3).

Finally, some of the suggested redistribution measures can be conceived as effecting changes in worldview, goals and values (**intent**), e.g., the decommodification of profit-oriented engagement through *repair charities* and other *nonprofit solutions* to maintenance and repair, or *investors valuing social outcomes*:

[if] you [investor] understand the whole life in social terms as well as in […] building terms, then you're prepared to take a lower profit in return for your investment. (COM2).

4.1.2. Implementation

Participants ranked most interventions as highly impactful and feasible. However, some highlighted the potential unintended consequences of implementing these interventions in isolation. For instance, when discussing the possibility to add damp monitoring devices, one participant noted the already considerable backlog HAs have in maintenance and repair, and warned that adding more data could further strain the system:

[…] we can't even get out with what we need to get done now […]. And I'm rather pessimistic; I think without […] like huge government funding intervention, nothing's gonna happen. (COM3).

Similarly, according to the same participant, costing building components across their whole life cycle "will just make development even more unfeasible", unless the short-term horizon on which viability is calculated is challenged:

I see loads of developments just stuck in feasibility, like 'we need to increase density, buy these people out, we need to […] take these lifts out […] because it's going to be too expensive'. (COM3).

The difficulty in bringing housing to higher standards with the funding available encourages the *sell-off of poor performing properties*—an already implemented strategy, whose consequences were widely debated (e.g., removing social homes from prime locations, gentrification) and seen as "morally wrong" (COM3).

In this context, participants discussed the importance of attracting new *investors valuing social outcomes*, such as local residents' pension funds, or religious organisations:

They were there […] and then they walked away. […] their return was pushed up too high […] but that could change. (COM2).

4.2. On demolition

Fig. 4 depicts poor *quality of the housing stock* and the raising *stigma associated to* [both tenants and] *the architecture of social housing* as key factors driving the *demolition* of social housing estates. In the CLD, the

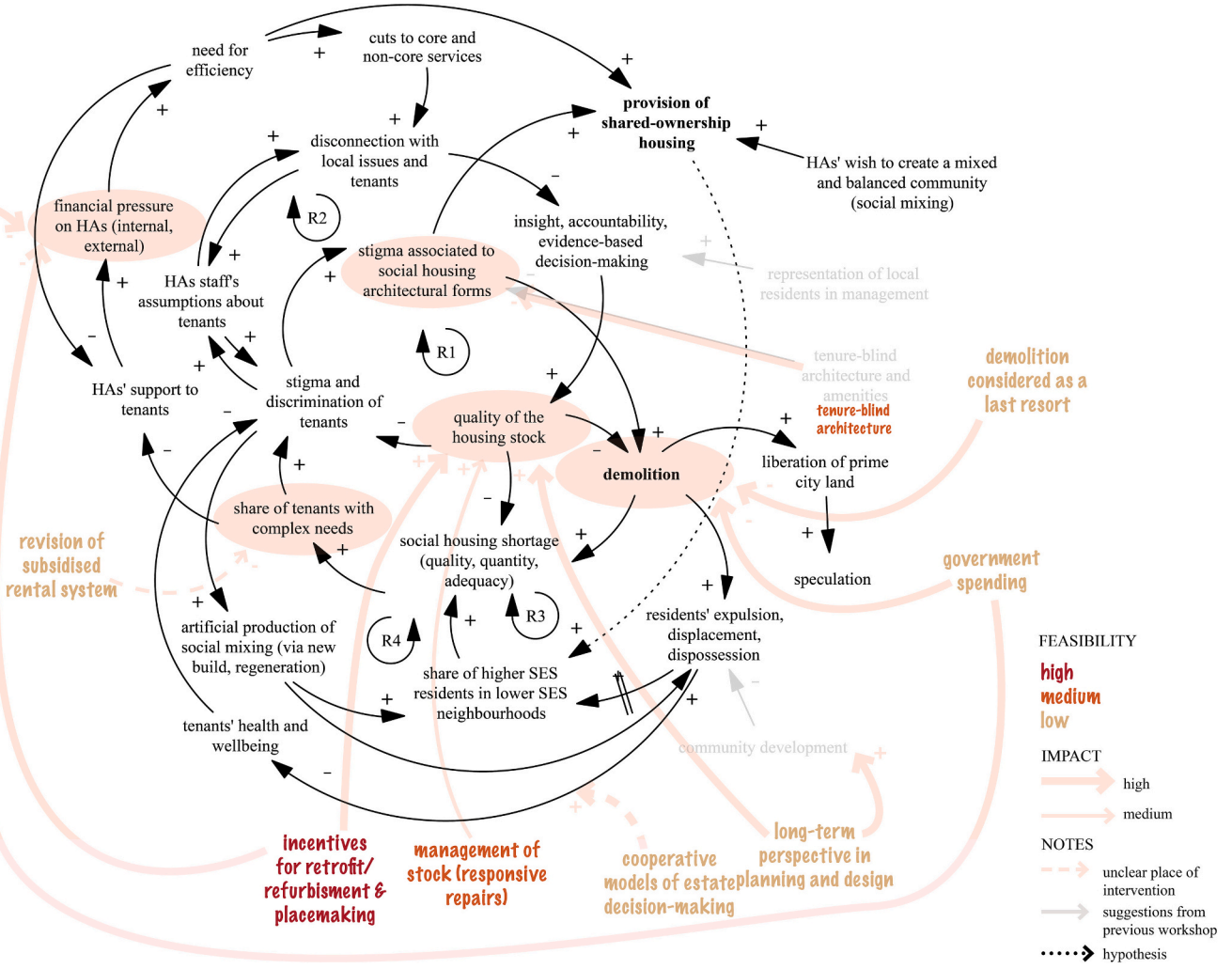

Fig. 4. CLD 2. How to hinder the reinforcing causes and consequences of demolition? Only key loops are shown. Grey is used to highlight interventions which were mentioned in the previous workshop, and are already implemented by HAs. SES: socioeconomic status.

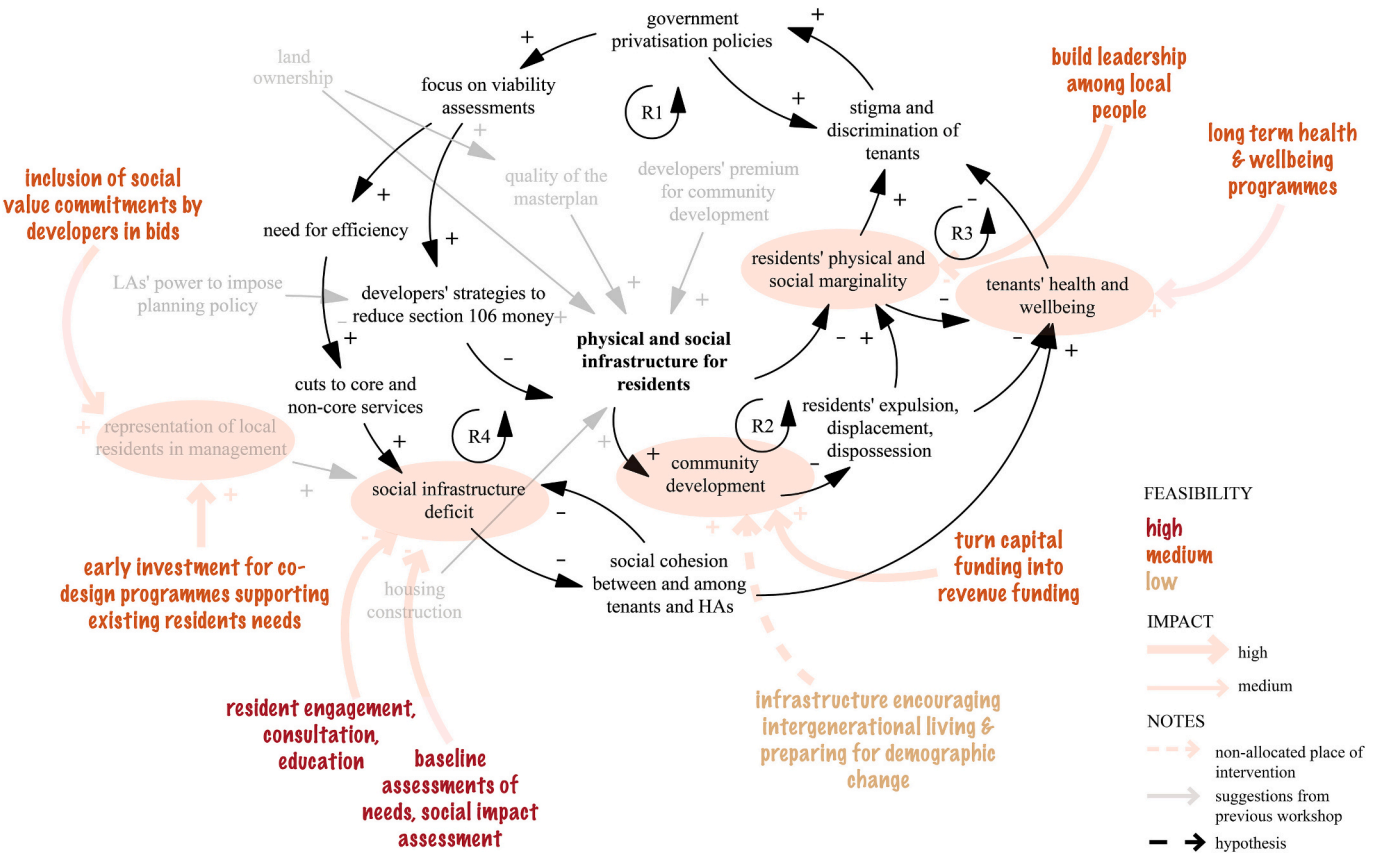

Fig. 5. CLD 3. How to ensure the provision of good quality physical and social infrastructure for existing communities? Only key loops are shown. Grey is used to highlight interventions which were mentioned in the previous workshop, and are already implemented by HAs.

need to demolish is reinforced via several loops. When causing *residents' expulsion, displacement* [and] *dispossession*, *demolition* can negatively affect their *health and wellbeing*, fuelling the wider *stigma and discrimination* that are mobilised to justify it (**R1**). Also, *stigma and discrimination* can reduce the ability of staff to engage in *evidence-based decision-making*, with impacts on the *quality of the housing stock* and thus its *demolition* (**R2**). In the CLD, strategies driven by *stigma*—such as mixed-tenure developments (*artificial production of social mixing, provision of shared-ownership* [market] *housing*)—can lead to a reduction in the number and share of social housing units (*social housing shortage*), accessible only to tenants with the highest and most complex needs (*share of tenants with complex needs*), exacerbating *stigma* (**R4**). Providing support to tenants with increasingly complex needs (mental, physical, financial) puts more *financial pressure on HAs*, and reinforces the need to cross-subsidise the provision of social homes via other housing tenures (e.g., *shared-ownership*; **R3**). Beyond *stigma*, the CLD shows the causal hypothesis linking the *demolition* of social housing to its potential to unlock *prime city land* values, motivating the densification of plots and *speculation*.

4.2.1. Interventions: How to hinder the reinforcing causes and consequences of demolition?

To address the system structures underpinning demolition, participants proposed interventions on system **parameters**, e.g., *incentives for retrofit and refurbishment* to improve the quality of the housing stock, and **feedbacks**, e.g., higher *government spending* to relieve the financial pressure and refurbish social housing units without the need to cross-subsidise:

> To increase the amount of [social] homes you have to put back three times more than you took out, otherwise, the financial viability doesn't work. You could stop that from happening but you would have to put in money from somewhere else [than market homes]. (PLA1).

Interventions challenging the current growth-driven system structures and paradigm were also discussed; these ranged from new system rules (**design**), e.g., establishing *demolition as a last resort* (against "the economics [which] often drive you to make quite a different decision" REG1) to changes in mindsets (**intent**), e.g., adopting a *long-term perspective in planning and design*, benefitting housing quality and communities:

> […] you're challenged by the economic profit, the pressures on the need to maximise the number of social rented homes. […] But really, in your heart of hearts, you know you'd make different decisions if you were taking a multiple decade view. (REG1).

Finally, interventions were also proposed to act upon the divisive relationship between different tenures that occupy a housing estate, from *tenure-blind architecture* to address *stigma* (**feedbacks**), to *cooperative models of estate decision-making* (**design**), and more radical disruptions of the current *subsidised rental system*, entailing a reconsideration of the categorisation opposing social tenants and homeowners (**intent**).

4.2.2. Implementation

Unless already put in place by HAs (e.g., tenure-blind developments, lobbying the government to remove the VAT on retrofit), most interventions were assigned a low feasibility, as their implementation was perceived as dependent on shifts in other actors' mindsets. Obtaining funding, for instance, was argued to require government to think systemically:

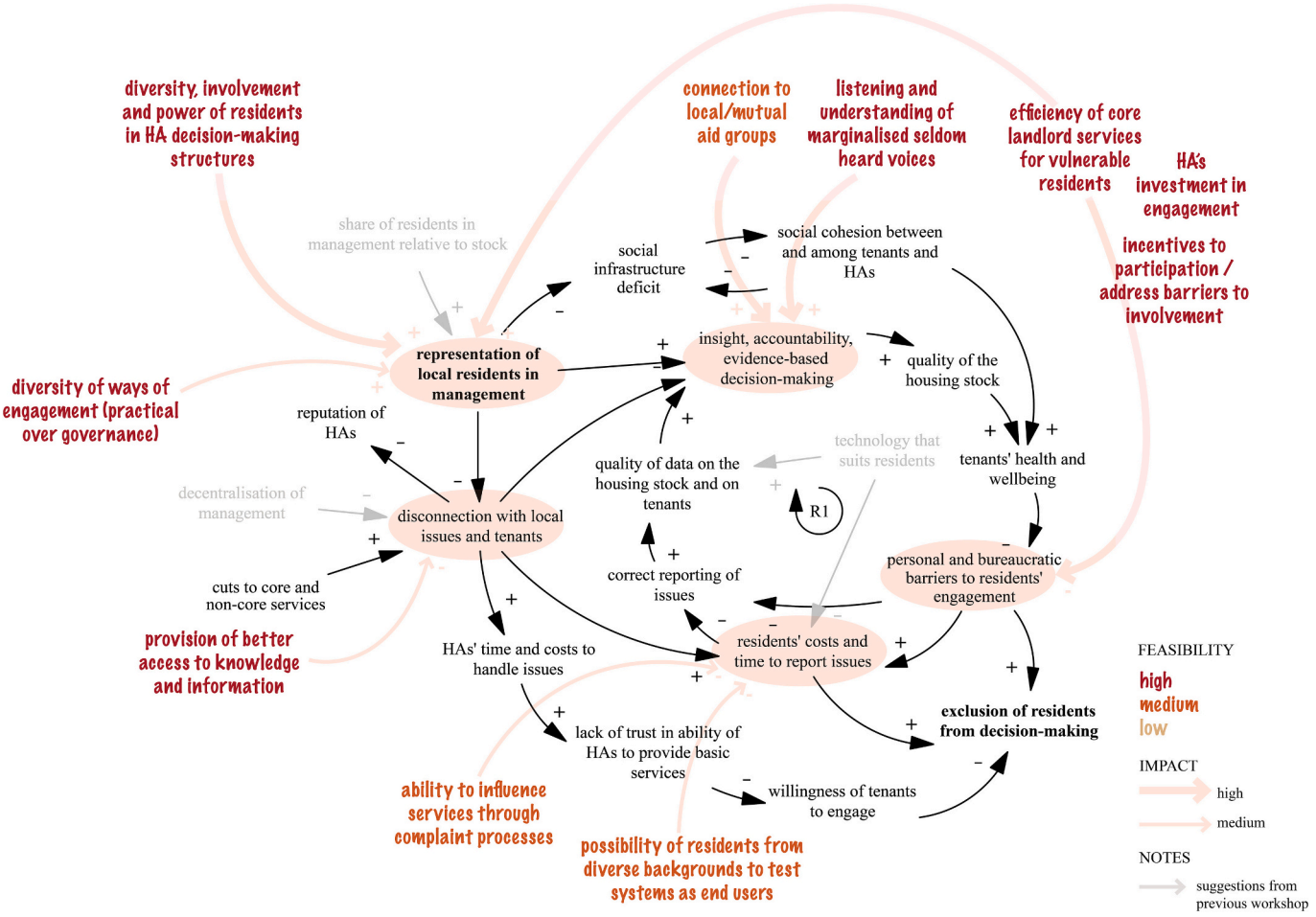

Fig. 6. CLD 4. How to unlock the agency of local residents? Only key loops are shown. Grey is used to highlight interventions which were mentioned in the previous workshop, and are already implemented by HAs.

> Government needs to be linking their carbon requirements, their housing expectations, this 'building with beauty' nonsense […], and their fiscal decisions. [It] needs to understand that […] the cost to the health service […] is directly related to housing.
>
> They have to redistribute what limited budget there is that goes into housing. […] huge amounts of money going to Help to Buy[4] just line the pockets of the shareholders […]. (REG1).

Similarly, according to one participant, cooperative structures need transformations at the scale of society and the economy:

> In this country we don't understand [cooperative models], because land [is] worth millions […]. This drive for growth - why is it a good thing? It eats resources. (REG1).

4.3. On physical and social infrastructure

Fig. 5 shows the causal hypotheses linking the increasing *focus on viability assessments* to a reduction in the *physical and social infrastructure for* [social housing] *residents*, with far-reaching negative consequences on *community development*, *residents' physical and social marginality* and their *health and wellbeing*. The resulting cause-and-effect chains generate several reinforcing loops, which exacerbate *stigma and discrimination of tenants*, *government privatisation policies*, and the growing *focus on* [the] *viability* [of social housing developments] (**R1**, **R2**, **R3**). In parallel, *cuts to* [*core and*] *non-core services* (e.g. community and neighbourhood services) worsen the *social infrastructure deficit*, which negatively affect the *social cohesion between and among tenants and HAs* and residents' *wellbeing*, exacerbating *stigma and discrimination* (**R4**).

4.3.1. Interventions: How to ensure the provision of good quality physical and social infrastructure for existing communities?

In response to the causal hypotheses on the structures underpinning the growing lack of infrastructure, participants elicited interventions targeting a range of system characteristics, most of which address the way the system is **designed**. For instance, participants discussed interventions changing the way information is distributed across the system—ranging from *baseline assessments of needs* and *social impact* assessments (tackling the *social infrastructure deficit* by accounting for residents' needs in regeneration projects), to *build*[ing] *leadership among local people* (with the goal to address *residents' physical and social marginality*):

> […] sometimes that can also be used against us, if we are not doing the right thing, but it's good for the community to have [a] strong voice of the local people, […] strong enough to tell the government "our landlord cannot provide this, you have to provide this." So you should help them build leadership. (COM1).

In this context, one participant shared the difficulties encountered in *resident engagement and consultation*, arguing that these efforts should be complemented with '*education*':

[4] Help to Buy is a government scheme aimed at helping first-time buyers to purchase a new-build home (by registered homebuilders) through an equity loan. In England, the scheme ended in March 2023.

> […] you can get engagement from residents, but they need to know what they're talking about as well. So it's about actually some investment in educating the community, and then getting feedback on what it is that they want and what is gonna be sustainable in terms of longevity. (LETSA1).

Alternative propositions had to do with changes in the rules of a system privileging viability, i.e., the possibility to *turn capital funding into revenue funding* to cover the costs of resident services (which is "probably not legal" PLA1), or the *inclusion of social value commitments by developers in bids*, based on which they would be "highly" scored.

4.3.2. Implementation

Interventions were assigned a high impact but medium feasibility, reflecting the potential but also the difficulties faced in providing and managing social and physical infrastructure. For instance, according to one participant, the benefits of resident engagement can be put at risk if *leadership* does not evolve in parallel to communities, i.e. "the people who stay there suddenly become very powerful" (RES1). In response, discussions revolved around existing ways to overcome barriers to engagement of the other "silenced" voices, e.g., after-school provision, free access to neighbourhood community centres, or start-up funding to support resident projects. Beyond these targeted interventions, participants mentioned existing initiatives to encourage resident networking (e.g., support in developing land for food production). Finally, although it was reiterated that running such an infrastructure requires funding, participants shared examples of existing strategies to raise it (e.g., lending facilities to the National Health Service for their general practitioners, fundraising from charitable organisations for programmes, services charges).

4.4. On tenant representation

Fig. 6 suggests that the *representation of local residents in management* affects several variables linked to the provision of good quality social housing, residents' health, and their engagement and participation. More specifically, a lack of representation can (i) worsen HAs' *insight, accountability, and evidence-based decision making*, with repercussions on the *quality of the housing stock*, residents' *health and wellbeing*, their *personal and bureaucratic barriers to engagement*, and thus on staff knowledge of resident and housing issues (**R1**); (ii) increase *disconnection* [between HAs], *local issues and tenants*, which has negative impacts on the *willingness of tenants to engage*; (iii) undermine the provision of a sound *social infrastructure*, resulting in a lower *cohesion between and among tenants and HAs*, with negative repercussions on *health*. Altogether, these cause-and-effect chains can exacerbate the *exclusion of residents from decision-making*.

4.4.1. Interventions: How to unlock the agency of local residents?

To address the causal chains linking the lack of *representation of local residents in management* to a decreasing housing quality and increasing barriers to engagement (**feedback**), the participants stressed the importance of, e.g., *incentives to participation* or *efficiency of core landlord services* [especially targeting] *vulnerable residents*. Beyond monetary interventions, some proposed policies that could potentially affect the system **design**, i.e., who holds information, and how power is distributed. The former include, e.g., *the possibility of residents to test systems as end users*, to reduce *residents' cost and time to report issues*; *better access* [of residents] *to knowledge and information* (or HAs' transparency), to mitigate the *disconnection* [of HAs] *with local issues and tenants*. As for power, several participants stressed the importance of setting up and supporting local ballots, resident boards, cooperative models, young people involvement, community organisations—interventions gathered under '*diversity, involvement, and power of residents in HA decision-making structures*' (see **Section 3.2**):

> I've got a whole load [of sticky notes] that are sort of linked, but I think in a nutshell it's about changing the sort of governance power structures.
>
> […] we can think about […] the actual systems and models of governance […] more resident-led, and give powers rather than trying to work on a deficit to say "we're gonna provide more information" or "we're gonna build capacity" […].
>
> It is about devolving power and decision making and money and all of that to the right people. (COM3)

4.4.2. Implementation

Most interventions were perceived as highly feasible, however, according to a participant, such a shift in power distribution would actually require changing "the mindsets of everybody who's working on housing" (STRA2). This translates into a set of tensions, for instance, between HAs' growing size versus the need for local knowledge, or between board members' specialised knowledge versus the need for "wisdom" experience.

Tensions also emerge between whether to provide bespoke services versus basic services that "you can roll out":

> We're obsessed, I don't know if we'll ever get it right. (STRA2).

Or around the means to implement those services:

> I don't think technology is the total solution. […] it is about training and […] get the right people, making them responsible and accountable, and having the right systems and technology will support them to do the job. (STRA2).

Finally, tensions emerged about how and why representation is implemented:

> There's something in changing the responsibility […]. If we keep it the same, you'll just have people coming […] and sit on our board […]; there's always been tenants' associations for years, haven't they, but what's the difference? (STRA2).

In this context, a participant discussed the perceived risk of representation becoming too local (or "parochial") and falling short on the breath of skills that boards should draw on, or being underpinned by a lack of trust, i.e., "I don't trust you and thus I want to be represented." (STRA1).

5. Leverage points and a degrowth agenda

The interventions proposed by workshop participants provide a picture of the mental models of some of the key actors in the social housing sector, including their understanding of what is desirable, achievable, and how. Such a picture offers an opportunity to explore the extent to which their perceptions align—or resonate—with the transformational change envisioned by degrowth.

Table 2 displays the interventions proposed for each CLD, including their feasibility and impact, along with the associated leverage points, system characteristics, and approaches to creating degrowth-oriented organisational value.

Approaches like 'Shrinking, slowing, and extending resource cycles' and 'Equalising inequalities' are more frequently linked to interventions targeting **parameters** (e.g., *incentives for retrofit/refurbishment*), and **feedbacks** (e.g., *efficiency of core landlord services for vulnerable residents*), which are more likely to induce minor change. According to Froese et al. (2023) these approaches create degrowth-oriented value through the provision of services and products that help to reduce the environmental impact of production and consumption and enable sufficiency-oriented lifestyles (e.g., *responsive repairs*), and through the (re)distribution of resources for a more equal access to them (e.g., *tenure-blind architecture and amenities*).

Table 2
Interventions, the leverage points and system characteristics they target, and possible alignment with degrowth. #: CLD number; D: deep; S: shallow; F: feasibility (1 = low; 3 = high); I: impact (1 = low; 3 = high). Approaches are organised based on the increased share of effective interventions; interventions are organised according to increasing effectiveness.

#	Intervention	I	F	Leverage point (D)	Leverage point (S)	System characteristic	Degrowth-oriented value creation approach
2	Incentives for retrofit/refurbishment and placemaking	3	3		Constants, parameters, numbers	parameters	Shrinking, slowing, and extending resource cycles
1	Monitoring equipment and data access	3	3		The lengths of delays, relative to the rate of system change	feedbacks	Shrinking, slowing, and extending resource cycles
2	Management of stock (responsive repairs)	2	2		The lengths of delays, relative to the rate of system change	feedbacks	Shrinking, slowing, and extending resource cycles
1	Consistent, long-term funding for planned maintenance	2	2		The strength of negative feedback loops, relative to the impacts they are trying to correct against	feedbacks	Shrinking, slowing, and extending resource cycles
4	HAs investment in engagement	3	3		Constants, parameters, numbers	parameters	Equalising inequalities
4	Efficiency of core landlord services for vulnerable residents	3	3		The lengths of delays, relative to the rate of system change	feedbacks	Equalising inequalities
4	Incentives to participation, reduction of barriers to involvement	3	3		The gain around driving positive feedback loops	feedbacks	Equalising inequalities
2	Tenure-blind architecture and amenities	3	2		The gain around driving positive feedback loops	feedbacks	Equalising inequalities
3	Long term health and wellbeing programmes	3	2		The gain around driving positive feedback loops	feedbacks	Equalising inequalities
3	Baseline assessments of needs, social impact assessment	3	3	The structure of information flows	The gain around driving positive feedback loops	design	Equalising inequalities
2	Revision of subsidised rental system	2	1	The power to transcend paradigms		intent	Equalising inequalities
3	Early investment for co-design programmes supporting existing residents' needs	3	2		Constants, parameters, numbers	parameters	Open and decentral creativity
4	Possibility of residents from diverse backgrounds to test systems as end users	2	2	The structure of information flows	The gain around driving positive feedback loops	design	Open and decentral creativity
4	Ability to influence services through complaint process	2	2	The structure of information flows	The gain around driving positive feedback loops	design	Open and decentral creativity
4	Diversity of ways of engagement (practical over governance)	2	3	The power to add, change, evolve, or self-organize system structure	The gain around driving positive feedback loops	design	Open and decentral creativity
1	Insurance provided by HAs for tenants to cover repairs	2	3	The power to add, change, evolve, or self-organize system structure	The strength of negative feedback loops, relative to the impacts they are trying to correct against	design	Engaging consumers in sufficiency-oriented prosumption
1	Tenants' responsibility for repairs (cooperative model)	2	3	The power to add, change, evolve, or self-organize system structure	The strength of negative feedback loops, relative to the impacts they are trying to correct against	design	Engaging consumers in sufficiency-oriented prosumption
1	Investment on internal repair services	2	3		Constants, parameters, numbers	parameters	Joining forces in rewarding and mutual collaboration
4	Connection to local/mutual aid groups	3	2	The structure of information flows		design	Joining forces in rewarding and mutual collaboration
3	Turn capital funding into revenue funding	3	2	The rules of the system	Constants, parameters, numbers	design	Joining forces in rewarding and mutual collaboration
3	Inclusion of social value commitments by developers in bids	3	2	The rules of the system		design	Joining forces in rewarding and mutual collaboration
3	Infrastructure encouraging intergenerational living and preparing for demographic change	3	1	The mindset or paradigm out of which the system arises	The lengths of delays, relative to the rate of system change	intent	Joining forces in rewarding and mutual collaboration
3	Resident engagement, consultation, education	3	3	The structure of information flows	The gain around driving positive feedback loops	design	Democratic, purpose-driven, and transparent governance
4	Provision of better access to knowledge and information	2	3	The structure of information flows		design	Democratic, purpose-driven, and transparent governance
4	Listening and understanding of marginalised seldom heard voices	3	3	The structure of information flows	The gain around driving positive feedback loops	design	Democratic, purpose-driven, and transparent governance
3	Build leadership among local people	3	2	The structure of information flows	The gain around driving positive feedback loops	design	Democratic, purpose-driven, and transparent governance
4	Diversity, involvement, and power of residents in HA decision-making structures	3	3	The power to add, change, evolve, or self-organize system structure		design	Democratic, purpose-driven, and transparent governance
2	Cooperative models of estate decision-making	3	1	The power to add, change, evolve, or self-organize system structure		intent	Democratic, purpose-driven, and transparent governance
2	Long-term perspective in planning and design	3	1	The mindset or paradigm out of which the system arises	The lengths of delays, relative to the rate of system change	intent	Democratic, purpose-driven, and transparent governance
2	Government spending	3	1		The gain around driving positive feedback loops	feedbacks	Overcoming economic growth dynamics
1	Whole life costing for components in viability assessments	3	3	The rules of the system		design	Overcoming economic growth dynamics
2	Demolition considered as a last resort	3	1	The rules of the system		intent	Overcoming economic growth dynamics
1	Repair charities, non-profit solutions	3	3*	The mindset or paradigm out of which the system arises	Constants, parameters, numbers	intent	Overcoming economic growth dynamics
1	Investors valuing social outcomes	2	1	The mindset or paradigm out of which the system arises		intent	Overcoming economic growth dynamics

Notes: The intervention *sell-offs of poor performing stock* is not included in the list. During the workshop, this measure was discussed to lead to a series of negative consequences.
*The high feasibility score is linked to the different understandings of the effects of this intervention (disrupting contracting services versus providing support, the latter of which is already happening).

On the opposite end of the spectrum are interventions targeting higher leverage points in the system, distributed in varying proportions among the remaining five approaches, with 'Democratic, purpose-drive, and transparent governance' and 'Overcoming economic growth dynamics' having the largest share. These interventions are aimed at effecting teleological change in the system of social housing provision, by influencing its **design** and **intent**. The former include changes in 'information flows' (e.g., for residents, via *engagement, consultation, education*; for HAs, via *social impact assessments* of projects), in the 'rules of the system' (e.g., including *social value commitments by developers in bids*, viability assessments accounting for *whole life costing*), and in the 'power to add, change, or self-organise system structures' (e.g., via *cooperative models of estate decision-making*). Changes in system design are underpinned by shifts in values, goals, and worldviews, through a redefinition of mindsets (e.g., *investors valuing social outcomes*) and the 'power to transcend paradigms' (e.g., a *revision of the subsidised rental system*). Within the associated approaches, value is generated in a variety of ways; for instance, by establishing practices that activate residents' agency (e.g. *build leadership among local people*; 'Democratic, purpose-driven, and transparent governance'); by redistributing resources for developing the infrastructure needed to support them (e.g., turning *capital funding into revenue funding*; 'Joining forces in rewarding and mutual collaboration'); or by engaging stakeholders in collective creativity (e.g., through a *diversity of ways of engagement*; 'Open and decentral creativity').

Beyond these trends, most approaches to degrowth-value creation encompass interventions at both low and high leverage points. The former can in fact pave the way for the latter; for instance, higher *government spending* can support a shift in system rules setting *demolition as a last resort*. However, interventions at shallow leverage points are not necessarily precursors to effective transformation (Fischer and Riechers, 2019); for instance, radical changes in the nature and power of social tenancies (*revision of the subsidised rental system*) cannot be levered by changes in parameters and feedbacks only. This reflects in the lower feasibility score assigned to almost all interventions affecting the system intent (F = 1, with 1 = minimum and 3 = maximum).

Furthermore, more than a third of the proposed interventions are linked to both deep and shallow leverages, reflecting their ambiguous effects. For instance, *listening and understanding of marginalised seldom heard voices* could contribute to changing the way information flows in the system, or eventually result in a tick-box exercise; the same is true for several of the interventions addressing resident engagement. Similarly, participants referred to the impact of *repair charities and non-profit solutions* in two ways; as "disruptive" (STRA1), if meant to address systemic dependencies (e.g., HAs' reliance on the same contracting services), or as "nice [and] supportive, but not necessarily transformational" (STRA2), when primarily aimed at mitigating the lack of funding for M&R.

Finally, while feasibility scores trends are aligned with the transformative level of the proposed interventions, impact scores are consistently medium to high, pointing to the great importance attributed by participants to the proposed activities (and thus their high value; Graeber, 2013).

6. Concluding discussion: towards degrowth?

This paper explored the perception of social housing providers about possible ways to address systemic issues in the social housing sector, and the extent to which they catalyse the socio-economic transformative ambition of a degrowth agenda. In a workshop with four London-based HAs, we elicited possible interventions in the social housing system. Discussions on their impact, feasibility, and possible implementation provided insights on the value participants attributed to each, on the perceived degree of control over them, and on the obstacles and opportunities to materialise them, respectively. Using the frameworks of Meadows (1999), Abson et al. (2017), and Froese et al. (2023), we then explored the kinds of transformation these interventions may trigger, and their alignment with approaches to creating degrowth-oriented value.

In the following, we discuss the theoretical and methodological contributions of this study, its limitations, and possible future research pathways.

6.1. Implications for reconceptualising the wider degrowth agenda

This study introduced four CLDs outlining hypotheses on the causes and effects of (i) the strategies devised by HAs in response to pressures (political, financial), and the consequent decrease in the quality of the housing stock; (ii) demolition, as a mean to address issues such as stigma or poor quality of the stock; (iii) disinvestment in social and physical infrastructure; (iv) a lack of representation and exclusion of residents from decision-making processes. The interventions proposed addressed system parameters and feedbacks (e.g., funding for maintenance and repair, monitoring equipment), as well as its design and intent (e.g., new governance models, including social values in bids and investments). 'Equalising inequalities' and 'Shrinking, slowing, and extending resource cycles' comprised a larger share of interventions at shallow leverage points, reflecting their perceived feasibility, but also their limited systemic effects. Conversely, interventions linked to 'Democratic, purpose-driven, and transparent governance' and 'Overcoming economic growth dynamics' were more often associated with the most transformative leverage points in the system.

These results are consistent with Kallis (2018) and Froese et al. (2023); according to the latter, "the desired [degrowth] transformation is primarily about a change in interpersonal relations and democratic social institutions, which subsequently translates into implications such as lower resource consumption and well-being" (p. 10). Similarly, our findings suggest that efforts to reduce the environmental impact of human activities and to address inequalities are directed at the symptoms rather than the roots causes of the systemic problems that housing degrowth seeks to tackle. For instance, addressing individual property rights and housing financialisation is critical to "projects of political emancipation and democracy" conducive to (self-)sufficiency (Savini, 2023, p. 1233).

On this basis, the degrowth agenda could be conceptualised as *a set of interventions with different leverage in the system, interconnected in feedback loops that generate degrowth-oriented value and thereby contribute to core values of degrowth* (ecological sustainability, local and global equality, conviviality and participation).

6.2. Developing a housing degrowth agenda

Our findings complement research in degrowth and ecological economics concerned with establishing 'sufficiency' or 'sustainable consumption' corridors to delimit a 'safe and just' space for humanity (Bärnthaler, 2024b; Dillman et al., 2024; Horn et al., 2025). In particular, they underscore the importance of deep leverage interventions that target the system structures and paradigms driving persistent housing expansion, as a prerequisite for providing housing between social foundations and ecological ceilings (i.e., 'Equalising inequalities' and 'Shrinking, slowing, and extending resource cycles', respectively; see zu Ermgassen et al., 2022, p. 9).

Consistent with other studies, we argue that identifying, analysing, and transforming entrenched growth dependencies is critical to decoupling the provision of adequate and affordable housing from the environmental impacts of 'unquestioned' construction (Corlet Walker et al., 2024; Heindl, 2022), thereby avoiding unintended consequences such as intensified rent-seeking, asset price bubbles, poverty and economic insecurity (i.e., 'Overcoming economic growth dynamics'; see Stratford, 2020). Moreover, our findings point to 'democratic, purpose-driven, and transparent governance' as a precondition for such a systemic change. This view is widely shared in degrowth scholarship, though contested in

terms of what forms such governance should take—ranging from deliberative tools within representative democracies (see e.g., Bärnthaler, 2024a) to radical, stateless self-organisation (e.g., Asara et al., 2013; Cattaneo et al., 2012; Toro, 2021).

In this context, our approach supports a coordinated combination of interventions at deep and shallow leverage points—aligned with the concept of degrowth as a 'strategic assemblage' (Barlow, 2022). Such an assemblage would be shaped based on a deliberate assessment of the interventions' impact on the system at hand, as well as a 'prioritization and intentional consideration of how strategic action can […] interrelate and the role of coordination towards such an assemblage' (Barlow, 2022, p. 86).

6.3. Capturing mental models to understand barriers and enablers

Consistent with other studies, the results of our workshop demonstrate the importance of eliciting stakeholders' *perception* of interventions in the system (including their feasibility, impact, barriers, and enablers) to uncover their alignment with the transformative ambition of a degrowth agenda (see, e.g., Çetin et al., 2021; Mete, 2022; Videira et al., 2014).

Firstly, large and expanding HAs are organised around complicated and complex decision-making structures, whose outcomes might not directly reflect the (changing) mental models of the stakeholders in the sector (Simon, 1990). For instance, the demolition of social housing estates is still a highly contentious field both in practice and research (Power, 2008); whilst some participants argued for setting demolition as a last resort, social housing estates demolition in England increased by 11 % in 2022–2023 compared to the previous year (DLUHC, 2024b).

Within this context, interventions perceived as highly impactful but low in feasibility could provide valuable insights into potential obstacles or tipping points to achieve a degrowth-oriented transition. Based on an empirical exploration of measures of housing degrowth in England and Wales, Tunstall (2023, p. 1285) argues that intentional degrowth *is* feasible, but "need[s] more political justification, changes to incentives and regulation, and a focus on those worst-off." Our work also highlights the importance of interventions at shallower leverage points (e.g. funding, incentives) to support transformational change, along with some of the barriers to their implementation.

Finally, workshop discussions around implementation resonate with issues that are at the heart of the degrowth debate. For instance, the degree of participation implied by the proposed interventions largely varied (from knowledge provision to new governance structures), with different leverage in the system, and with various perceptions of their feasibility and implementation challenges (i.e. power dynamics within resident groups, and between HAs and residents). In this setting, the concerns raised by participants align with those of other degrowth scholars, who pointed to the gap between the enthusiasm in the promotion of citizen involvement and its real-life performance; "participation is not the panacea against social exclusion [and] effective and fruitful inclusion requires specific conditions that must be met" to diffuse citizen know-how (Savini, 2011, p. 964). Moreover, it is worth noting that deeper-level interventions concerned with empowerment (such as tenants assuming "responsibility" for repairs via cooperative models) may either be designed as a mean to foster autonomy and collective ownership, or reinforce individual responsibilisation, a dynamic widely critiqued as a hallmark of neoliberal governance (Schoppek, 2020; Windegger and Spash, 2023).

6.4. Transdisciplinary and systems approaches to think beyond growth

Finally, our work demonstrates the value of bridging insights from different research fields, including their frameworks and methods, in response to current societal needs, i.e., a transdisciplinary approach to knowledge production (see e.g., Lawrence, 2021). In particular, it shows the potential of participatory SD activities to elicit and potentially orient perceptions of the interventions needed in the system towards degrowth, rather than simply envisioning measures deemed 'acceptable to the electorate' (Koch, 2018, p. 36). In anonymous feedback questionnaires, participants unanimously shared their appreciation of the workshop structure (e.g. use of prompt questions, the systems thinking approach) and learnings (e.g. around their assumptions, and the possible changes that they can make); furthermore, all participants responded positively (indicating either 'I strongly agree' or 'I agree') to the statement: "I now know more about how to systemically act upon the interrelated challenges affecting the provision and regeneration of social housing."

6.5. Limitations and future research pathways

The findings of this study have to be seen in light of some limitations.

Firstly, enhancing the usability of the CLDs as boundary objects required making trade-offs between "complex representational validity" and "ease of insight" (Abson et al., 2017; Black, 2013; Murphy and Jones, 2020, p. 3; Zimmermann and Pluchinotta, 2020). In this context, whilst the system boundaries for the initial larger CLDs were set through participatory activities (thus implying a process of negotiations over boundary judgements), the boundaries around the four smaller CLDs and their core focus were based on researchers' analytic assumptions, e.g., of what is important or timely to address, what are counterintuitive dynamics to include. The resulting system is what Ison (2008) defined 'system of interest', i.e., "a system defined by the worldviews and concerns of researchers and other actors involved" (Abson et al., 2017, p. 32). Considerations around boundary critique have been addressed extensively in the system dynamics literature (see e.g., Forrester and Senge, 1980; Nabavi et al., 2017; Sterman, 2002; Ulrich, 2000). In the context of this study, the shortcomings associated with 'self-reflective' boundary setting were partially mitigated by the involvement of HA participants in the development of the six original CLDs. A detailed report describing the large and small CLDs was shared ahead of the session, supporting understanding of the broader system from which the four smaller CLDs were extracted. Furthermore, during the workshop, participants could provide additional feedback on the diagrams (see the amendments of Fig. 3), which were presented as non-exhaustive subsystems of larger systems.

A second limitation is in the nature of participatory convergent activities. Although the proposed measures point in the direction of degrowth-oriented value creation, they are the results of group dynamics, and might not directly reflect the point of view of all the participants, nor of the HA they belong to. During the workshop, participants were asked to individually elicit possible interventions, before sharing and discussing them with the group; this approach potentially limited power dynamics that could have steered the conversation towards less, or more, radical measures.

These limitations open pathways for future research, aimed at validating and unpacking our hypotheses and devising strategies and action accordingly. As for the former, participatory activities could involve a broad range of HA participants in exploring the interlinkages identified by the researchers between interventions, leverage points, and degrowth. By introducing the degrowth agenda and alternative approaches to organisational value creation, these activities could potentially provide a framework for HAs to formulate additional interventions.

To move towards the design of strategies, future research could involve a range of stakeholders (e.g. residents, architects, urban planners, LAs) to explore the interdependence and interactions—including co-benefits, trade-offs, and unintended consequences—of the proposed interventions as well as their impact across CLDs, making it possible to critically revise their transformative potential accordingly. These activities could involve system dynamics simulations, which allow testing the effectiveness of the suggested interventions in generating change. Finally, this investigation could lay the ground for the identification of *action levers*, i.e., areas where a coordinated set of interventions affecting

several leverage points produce positive and lasting change (Nick, 2023).

Involving a wider range of stakeholders is also critical for achieving a more holistic understanding of barriers and enablers to implementing the proposed interventions, as well as of how power and agency are framed and distributed across the system. Reviews of the structures and growth dependencies embedded within the political economy of British housing could complement these explorations at a higher systemic level, informing the identification of multi-scalar interventions, implementation timelines, and the alliances and resources required in different degrowth-oriented scenarios (see e.g., Heindl, 2022; Stratford, 2020; zu Ermgassen et al., 2022).

Finally, the approach adopted in this study could be applied to different housing contexts, to help actors design alternatives to the growth-oriented urban imaginary underpinning the complex system structures that have so far jeopardised the supply of good quality and affordable housing for all.

CRediT authorship contribution statement

Anna Pagani: Methodology, Data curation, Writing – original draft, Investigation, Conceptualization, Project administration, Formal analysis, Visualization, Funding acquisition. **Al Walker:** Investigation, Writing – review & editing, Methodology, Validation. **Alex Macmillan:** Validation, Writing – review & editing. **Arfenia Nita:** Writing – review & editing, Validation, Investigation. **Michael Davies:** Validation, Writing – review & editing. **Nici Zimmermann:** Writing – review & editing, Investigation.

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Declaration of competing interest

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Data availability

Due to the nature of the research, ethical restrictions apply and supporting data (workshop transcripts and recordings) is not available.

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