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# Dynamics of short-term and long-term decision-making in English housing associations: A study of using systems thinking to inform policy design

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ABSTRACT

Incorporating consideration of causal mechanisms of complex policy issues and goals is critical for policy design, but tools to support exploration of the interconnections, trade-offs and unintended consequences of a focused policy issue are limited. Understanding how to undertake systems-based policy design is crucial for designing effective policy interventions. Through a case study with two housing associations (HAs) in England, this paper explores how group model building (GMB) workshops, as a systems thinking tool, can elicit complex causal mechanisms to inform policy design. The paper presents a causal loop diagram (CLD) describing English HAs' decision-making around sustainable and healthy housing in response to housing policies. The CLD illustrates how frequent policy changes and disjointed objectives can create disruptive challenges for HA's long-term decision-making, increasing short-term decision-making, and compromising the delivery of housing policy goals as an unintended consequence. We argue that the systems perspective of the interlinkages between policy design, specifically inconsistencies and changes, and housing organisations' reactions highlights the importance of the systems thinking approach of policy design to support HAs' organisational decision-making for sustainability and social issues. Policy design elements that facilitate HAs' long-term decision-making are discussed. Through the case study, we contribute to the housing policy literature by explicitly showing how policy changes affect HA's decision-making. We advance the integration of policy design and soft operational research fields by describing the systems thinking approaches are used not only on the content of policy design to enhance a particular policy, but also on increasing our understanding of its process, by generating insights about the nature of decision-making dynamics and challenges faced. Limitations and implications for future research are discussed.

## Introduction

Policy-making is a multi-stage process including agenda-setting, policy formulation, decision-making, implementation, and evaluation (Howlett et al., 2017). Specifically, policy design or 'formulation' is a critical step to uncover the links between policies and desired goals (Howlett & Mukherjee, 2018). Despite the high ambitions of public policies, the achievement of intended or planned policy goals can often be compromised or limited in practice, resulting in policy failures. The reason is that social problems are often characterised by a heightened level of uncertainty, interconnectedness and dynamics that challenges simple solutions (Rittel & Webber, 1973). Other factors can lead to policy failures, such as information or knowledge gaps, a lack of resources, limited bureaucratic support, and political corruption (Howlett, 2012; Hudson et al., 2019). Therefore, incorporating causal mechanisms in policy design, which describe the process through which a policy input can affect the real-world outputs, can be critical for effective policy design (Capano and Howlett, 2019). For complex policy issues, a systems thinking approach to identifying policy design based upon complex causal mechanisms can be useful as it supports the exploration of issue boundaries and explores interactions of factors relevant to the policy issue, yet this remains under-explored (Foote et al., 2021).

In the soft operational research (OR) field, the exploration of causal mechanisms to form decision tools is a recurring interest (Franco, 2013; Eden & Ackermann, 2013; Mingers & Rosenhead, 2004), providing various opportunities to support policy design particularly for policy areas with heightened level of uncertainty or complex interconnectedness. Different types of problem structuring methods are developed to elicit experts' knowledge and understanding of issues (Mingers & Rosenhead, 2004), such as cognitive mapping (Eden, 1988), facilitated mod-

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elling (Franco & Montibeller, 2010), and group model building (GMB) workshops (Anderson & Lewis, 2019; Vennix et al., 1992), aiming to build applicable decision support models (Eden & Ackermann, 2013; Vennix et al., 1992). Among these tools, the GMB workshop is a participatory modelling method involving stakeholders in the modelling process through group exercises, focusing on complex causal connections (Hovmand et al., 2012). GMB workshops produce systems maps, such as causal loop diagrams (CLDs) and qualitative stock-and-flow structures, sometimes providing causal pathways for formal simulation models. CLDs describe a system's important causal mechanisms and loops describe endogenous causal mechanisms (Sterman, 2000), and can be an effective and practical approach to exploring policy issues such as urban health (e.g. Zimmermann et al., 2018; Stave, 2010). Studies of GMB workshops show that the participatory process increases participants' learning and insights about the defined problem and potentially results in policy and systems changes (Scott et al., 2016, Rouwette et al., 2002). The exploration of organisational actors' decision-making in policy design is recognised (see Howlett & Mukherjee, 2018; Ferretti et al., 2019; Pluchinotta et al., 2019), however, no significant research has examined the interconnections between policy design and organisational decision-making, or attempts to use CLDs to generate systems insights in supporting policy design thus far.

To investigate how systems insights can inform holistic policy design, we conducted a case study with two large housing associations (HAs) based in England. Housing policies often carry a multidimensional interconnection to environmental quality, social capital, health, quality of life, and economic growth in localities, remaining a critical area to intervene in the social policy arena (WHO, 2018; WHO, 2021). The HAs in England, as not-for-profit organisations receiving public funds, are essential organisations providing affordable and quality housing to low-income populations. In 2020, 10% out of 23.5 million occupied residential dwellings in England were owned by HAs (DLUHC, 2022a). While the proportion of social rented sector households has followed a long-term downward trend since the high point in the 1970's, the supply of social rented homes is now slowly increasing (DLUHC, 2022b). Also, according to the English Housing Survey (DLUHC, 2022a), compared to private rented and owner-occupied dwellings, social sector homes have the highest Standard Assessment Procedure scores, which measures the energy efficiency of dwellings. However, studies of HAs recurringly describe tensions of fulfilling their commercial and social goals, suggesting that changes in policies and funding continue to challenge the delivery of policy goals, and shift HAs from a traditional social-oriented pathway to a hybrid social-and-market operation trajectory (Jacobs and Manzi, 2020; Mullins, 2000). Decision-making challenges that HAs face necessitate a deeper understanding of how housing policy can be improved to ensure the delivery of healthy and sustainable housing for vulnerable populations.

The aim of this paper is to develop a CLD of HAs' decision-making around sustainable and healthy housing, and to explore how systems thinking can inform housing policy design. Based on a case study, it presents a CLD derived from GMB workshops and the subsequent qualitative analysis of these workshops. The CLD highlights the underlying dynamics contributing to tensions between HAs' long-term and short-term decisions facing disjointed and frequent policy changes. We contribute to the housing literature by explicitly highlighting dynamics and tensions in HAs' decision-making caused by policy changes. We advance the integration of policy design and soft OR literature by describing the systems thinking approach in policy design and its application in a specific domain. We increase understanding of the process of systems-thinking based policy design by generating insights about the nature of decision-making dynamics and challenges faced.

The paper is organised as follows: the next section introduces existing knowledge about systems thinking in policy design and describes how causal mechanisms can be incorporated. Following that, we explain UK housing policy and English HAs' background, providing case study contexts. Then we describe the GMB workshop process and methods. Finally, we present CLD results and discuss how to incorporate systems thinking in policy design.

## Causal mechanisms and systems perspectives in policy design

In this section, we explore how systems thinking could be elicited and incorporated into policy design. We firstly describe relevant research of causal mechanisms in the policy design and OR field. Then we describe the approach of using GMB workshops and CLDs to generate systems insights in policy design.

### *Causal mechanisms in policy design and OR field*

Capano and Howlett (2019) introduced a policy design tool with a mechanistic perspective attempting to better incorporate causal mechanisms in policy design. The design tool includes five elements: tools, resources, mechanisms, behaviours, and policy impact. The mechanism-based tool essentially outlines how situated decisions and events would activate first-order changes (direct changes in individuals' and groups' behaviours) and second-order changes (effects of first-order changes), altering the situations of policy environments (Capano, 2019). First-order changes define direct surface behaviour changes in the system, such as policy tools and outputs that can be perceived relatively easily. In contrast, second-order changes are underlying changes in the system such as policy learning and diffusions of information. For example, a shift in a government's agenda and performance metrics changes actors' 'policy learning' and adjusts their understanding and beliefs of an issue (Howlett, 2019a; Howlett, 2019b; Moyson et al., 2017). The combination of first-order and second-order changes in the policy design essentially attempts to address the complex nature of policymaking by exploring different levels of causal mechanisms.

Similarly, in the soft OR research, various model-based approaches have been developed to elicit causal mechanisms to support policymaking and decision-making. For example, facilitated modelling approaches which engage with experts and clients employ heavily visual displays to represent the structural complexity of the problem situation of interest (Franco & Montibeller, 2010). Cognitive mapping focuses on generating a means/ends graph that highlights the hierarchy ranking of goal statements and causal pathways to achieve the goals (Eden, 1988). The underlying assumption of these approaches is that causal mechanisms contain critical information for actors in the system to intervene, which supports group decision-making, negotiation, and conflict management (Franco et al., 2016). GMB workshops and the elicited CLDs, in the tradition of system dynamics modelling, take an explicit systems perspective of causal mechanisms (Vennix et al., 1996). Specifically, CLDs are a set of causal loops and pathways, possibly elicited from participants, to visualise the interconnections between variables in the system. Causal loops in system dynamics are characterised by an endogenous lens, seeking to explain system changes by looking for influences inside the system (Richardson, 2011). Though the evaluation of GMB workshops is challenging (Rouwette et al., 2002), many researchers have demonstrated the effectiveness of using feedback thinking to explore social systems, policies, and organisational behaviours, particularly for messy policy areas (Eker & Ilmola-Sheppard, 2020; Zimmermann et al., 2018; Richardson & Andersen, 2010; Meadows, 2008; Morecroft, 1985, 1988).

Another underlying assumption in policy design and OR tools is that the 'means/ends' chain depends on individuals' and organisations' decisions and behaviours. Thus understanding actors' decision-making is significant as they formulate the implementation of the policy design. For example, Howlett and Mukherjee (2018) argue for the importance of understanding institutional and behavioural contexts when designing policy interventions. They suggest that the effectiveness of policy design depends on the decisions, knowledge, and interests of multiple actors in the problem environment. There is a renewed interest in designing new

approaches to incorporate decision-making elements into model analysis and policy design (Franco et al., 2021; Pluchinotta et al., 2019). Ferretti et al. (2019) explore connections between OR science and policy design by focusing on how to develop novel decision alternatives, demonstrating the potential to improve policy design tools by incorporating management, decision, and operational science. Rather than positioning organisational decisions and behaviours at the 'ends' part of the causal mechanism, we argue that decisions and behaviours are often endogenous in the system's causal mechanisms, which are critical to attaining policy outcomes. Decisions are based on individuals' perceptions and learnings from the real world and then alter the real world, forming a feedback relationship between decision-making and the outside environment (Sterman,1994). A systems perspective of policy design not only includes the interconnections of policy goals and mechanisms but also includes considerations of organisational-level responses within the causal mechanism. However, despite the shared interests in complex causal mechanisms in policy design and soft OR fields, tools to support the exploration of the systems and endogenous perspectives in policy design are limited, at least not using a replicable procedure to understand the complex connections, trade-offs, and unintended consequences between policy design and organisational level responses.

### *Embedding systems thinking in policy design through GMB and CLDs*

Wicked policy issues are often multidimensional and require structural and collaborative instead of simple solutions. We argue that the systems thinking lens can effectively explore the complex causal mechanisms of challenging policy issues, identifying the underlying drivers of first-order and second-order mechanisms within the system. Also, the explicit exploration of organisational responses in policy design is required, as relevant actors decide if and how to bring in changes beneficial for resolving wicked policy issues, impacting the success of policy design.

In this study we focus on the exploration of using CLDs elicited from GMB workshops in generating systems insights. Often there are two types of outputs from GMB workshops: 1) qualitative CLDs or stock-and-flow models or 2) computer (simulation) models which are built from causal mechanisms from the former. The development of CLDs and simulation models often involves considerable additional facilitator input and multiple workshops. Scott et al. (2013) discovered that GMB sessions could facilitate long-term changes in mental model refinement and alignment, and participants believed that exploration of the causal relationships helps clarifies thinking and understanding of the problem. Thus a critical step in applying GMB workshops in policy design is to understand what systems insights can be generated from the CLDs, and how causal relationships can inform policy design. Analysis of causal relationships and loops is not new in the OR community. For example, analysis of cognitive maps, which map the hierarchy of goals, involves detecting the reinforcing and feedback loops in the system (Eden, 2004). However, tools explicitly describe how systems insights can be used to inform policy design are limited.

We draw from the policy design literature to explore how the causal dynamics underlying elicited CLDs from GMB can be considered in the policy design. We adapt the policy design tool from Capano and Howlett (2019), of which an adaptation is shown on the right side of Figure 1. We add another element 'loops influenced' to highlight endogenous feedbacks in the causal mechanisms. We replaced the element 'tools' with 'systems interventions' to be specific about intervention points derived from the CLDs. Capano and Howlett (2019) described tools as policy instruments such as economic incentives, subsidies, and regulations. Here, 'systems interventions' refer to intervention points that address the target, interconnected variables and underlying causal mechanisms. We also replaced 'behaviours' from the original design tool to 'organisational responses' to consider which organisational decisions and general responses would be influenced. Table 1 lists the relevant terms and definitions of the policy design elements and relevant concepts.

Figure 1 introduces the systems thinking approach in policy design, and corresponding policy design elements. As the right part of the Figure 1 shows, the policy design elements include: policy outputs, organisational responses, causal mechanisms, loops influenced, systems interventions, and resources. For the policy design process, we start with the identification of target policy outputs, which can be tangible or intangible depending on the goals that participants identified. Then core feedback loops need to be identified. The pathways linking the loops and policy outputs are critical information needed for policy design. It is important to recognise that without a simulation model, the quantitative exploration of the model behaviours is limited. But this process of engaging with the CLD allows critical inquiry and interaction of the causal mechanisms. After identifying the causal pathways, we need to identify scenarios to strengthen or weaken the loops. Loops are significant as they generate endogenous behaviours corresponding to the systems structure. The decision to strengthen or weaken specific loops depends on the desired output changes while accounting for the reinforcing or balancing nature of the loops (see Table 1 definitions). Interventions to strengthen loops increase the weighting and potential dominance of the loops. Interventions to weaken loops may break the loop or decrease the weighting and potential dominance of the loops. Finally, learning from the analysis process, which is critical in GMB workshops, can generate new understanding of the target policy outputs, loops and pathways. New variables and connections can be added to the model to refine variables and loops. The systems thinking based policy design approach embed the core information from GMB workshops in identifying policy options. The next section we describe the case study contexts and the workshop process.

## Housing policies and housing associations in England

In this section, we introduce the research context of the case study. We first introduce relevant UK housing policies, and then we summarise recent research on decision-making in HAs.

### *Housing policy context*

Over the last few decades English national and local housing policies increasingly stress the importance of both the quantity and quality of homes, with recent reinforced emphasis on the former (MHCLG, 2021a, 2020; GLA 2020a). Policy tools have been developed to achieve the numerical house-building targets alongside more effective quality standards. For example, the Housing Health and Safety Rating System (HHSRS) was devised as a risk-based evaluation tool to assess health and safety in dwellings, replacing the Housing Fitness Standard (ODPM, 2006). The definition for a 'decent home' was updated in the same year to reflect HHSRS criteria, and defines decent homes as those in a reasonable state of repair with access to modern facilities and services, and providing reasonable thermal comfort (DCLG, 2006). In London, the number of non-decent affordable housing for HAs and council homes decreased dramatically since 2006 to 2018 (GLA, 2020b). The criteria for the Decent Homes standard are currently under review (MHCLG, 2021b) to understand its current suitability for the social housing sector.

The National Planning Policy Framework (NPPF) (MHCLG, 2021a) sets out the government's strategic planning policies for England. This is the fourth iteration since its initial form in 2012, illustrating the unstable nature of planning regulation. In August 2020, the government consultation *Planning for the Future* announced a package of proposals aiming to transform the existing planning system in England (MHCLG, 2020). The consultation acknowledged that the existing process for negotiating developers' contributions to affordable housing and infrastructure is unclear and complex. The stated goal for this proposed reform was to bring in planning system changes to "streamline and

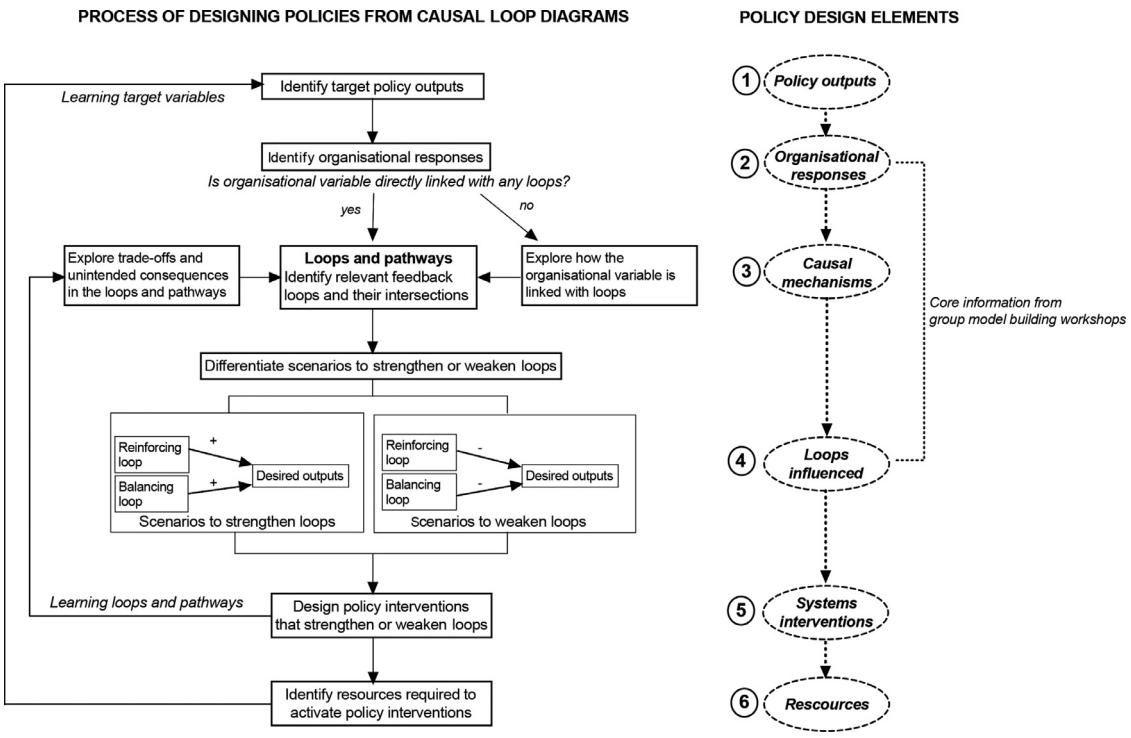


**Fig. 1.** Systems thinking approach in policy design. The right part of the figure shows elements of policy design adapted from Capano and Howlett (2019), whereas the left part outlines the process for analysing causal information from GMB workshops.

**Table 1**
Terms and definitions.

| | Terms | Definitions |
|---|---|---|
| Policy design elements | Policy outputs | Goals, objectives, and outcomes identified |
| | Organisational responses | Organisations' decisions and behaviours in response to the policy |
| | Causal mechanisms | Causal pathways between variables in the CLD, and means/end assumptions between interventions, resources and organisational responses and outputs |
| | Loops influenced | Feedback loops influenced by the systems interventions and resources in the causal loop diagram |
| | Systems interventions | Intervention points that deploy resources to influence the target variables, interconnections between factors, and causal mechanisms within the identified systems boundary |
| | Resources | Information, authority, treasure, or organisational resources needed to incur changes between interventions, and causal mechanisms |
| Loops | Feedback loops | Feedback loop are characterised by circularity, in which a change of one variable loops back on itself after travelling the causal chain |
| | Reinforcing loops | Feedback loops that are self-reinforcing, indicating that change in one direction triggers more change in the same direction. This will be detected when the number of negative arrow polarities (-) in the loop is even |
| | Balancing loops | Feedback loops that are self-correcting, indicating that change in one direction will be somewhat counteracted. This will be detected when the number of negative arrow polarities (-) in the loop is uneven |

modernise the planning process" and add a new focus on sustainability and design (MHCLG, 2020, p.4). Recent changes to the NPPF in July 2021 stress the importance of "beautiful" and "sustainable" places through improving design guidelines and practices (MHCLG, 2021a). These changes to national planning policy have been called into question (e.g. BBC, 2021) but regardless have the potential to significantly influence HAs' decision-making.

Neoliberalism has permeated housing and planning policy in the UK since the 1980s. Local authorities are responsible for managing local spaces within their areas. Changes in funding regimes led to a rapid decline in local authority housing supply. In 2020-21, it is estimated that the HAs delivered 20% of new build dwellings while local authorities delivered 2% (DLUHC, 2022b). Jacobs & Manzi (2017) suggested that contemporary politicians are increasingly reluctant to support social rented housing, and the task of building new homes is increasingly moved to private sector developers. In London, Greater London Authority (GLA) is responsible for strategic planning, transport, and economic development. The latest London Plan revives the role of councils and HAs to build more affordable homes and increase the diversification of the housebuilding industry. The Plan also states the London Mayor's intentions to intervene "supporting boroughs and housing associations to deliver more homes directly, including by providing investment and lobbying Government for reforms to enable boroughs to build at significantly greater volumes" (GLA, 2020a, p. 500). These policies exemplify the necessity to re-examine how HAs and other sector actors face fulfilling their social mission to provide housing for those households who have been failed by the private housing market.

*Impacts of policies on housing associations' decision-making*

Existing knowledge of HAs' decision-making relies on two types of the institutional perspective: critical junctures and hybridity. Firstly, critical junctures refer to brief phases when dramatic change happens (Capoccia & Kelemen, 2007). The mid-1970s was identified as a critical juncture as neoliberalism emerged to reduce public expenditure and restructure social welfare policies (Jacobs & Manzi, 2017). One significant

**Table 2**
Workshop sessions information.

| Session goal | ID | Date | Time | Participants | Scripts used |
|---|---|---|---|---|---|
| Identify Problems | 1 | October 2020 | 60 minutes | 1 participant from HA-A | Eliciting seed structure |
| Start Mapping Causal Structure | 2 | November 2020 | 90 minutes | 3 participants from HA-A, 1 participant from HA-B | Variable elicitation<br>Mapping from seed structure |
| | 3 | November 2020 | 60 minutes | 1 participant from HA-A | Variable elicitation<br>Mapping from seed structure |
| Continue Mapping Causal Structure | 4 | December 2020 | 90 minutes | 4 participants from HA-A | Causal structure mapping |
| | 5 | December 2020 | 90 minutes | 3 participants from HA-B | Causal structure mapping |
| CLD Validation | 6 | December 2020 | 60 minutes | 4 participants from HA-A | Presentation and validation |

change was the Right to Buy (RTB) programme introduced in the Housing Act 1980, which dramatically shifted housing ownership by giving tenants the legal right to buy their homes from councils. Another critical juncture was the manifesto commitment from the 2015 General Election which extend the RTB to HAs and restrict rent increases, pressuring HA's decision-making dilemmas (Manzi and Morrison, 2018). Rather than viewing certain moments are critical, Malpass (2011, p.317) suggest that the changes of social housing provision in the UK are "small, gradual and incremental changes" instead of "dramatic transformations at a given point of time".

Secondly, hybridity refers to the co-existence of the logic of social mission and market efficiency (Blessing, 2012; Sacranie, 2012). Empirical evidence recurringly suggests that HAs experience tensions when attempting to fulfil both commercial and social decision-making goals (Jacobs & Manzi, 2020; Mullins, 2000). On the one hand, HAs are often charities that receive public funding to provide social housing and are regulated by the Regulator of Social Housing; on the other hand, they are also major providers of new private housing for sale or rent, cross-subsidising their social purpose. Empirical evidence includes contradictory views on whether HAs' decision-making is dominated by the market and commercial logic prevalent in the broader housing sector, or is actively pursuing social goals (Morrison, 2017; Tang et al., 2017). Different patterns of the hybridity have been identified in changes to HAs' accountability to government and the private sector (Mullins, 2006), individual employees' interpretations and responses (Child, 2020; Pache & Santos, 2013), organisational communications and collaborations (Battilana et al., 2015) and asset management strategies (Morrison, 2017). Changes in housing policy shapes HAs' perceptions of market-based values, driving decisions such as prioritising asset or disposal strategies and recruiting board members with financial and legal expertise rather than community experience (Jacobs & Manzi, 2020). Conflicting values within HAs leads them towards a hybridity pathway that embraces competing logics to achieve social missions while facing market pressures (Battilana et al., 2012; Battilana & Dorado, 2010). Dynamics of competing institutional logics in practice highlight the complexities and tensions in HAs' decision-making.

## Methods

To investigate how systems thinking can inform policy design, we conducted a series of GMB workshop sessions with two large English HAs (HA-A and HA-B in Table 2) during November and December 2020. Both HAs manage large-scale regeneration projects in London and other parts of the UK. The workshops engaged with key stakeholders through a sequence of sessions with pre-defined scripts, to elicit stakeholders' understanding of the system's causal links based on their mental models (Doyle & Ford, 1998). The aim of GMB workshops is to elicit a CLD of HAs' decision-making around sustainable and healthy housing to inform policy design. Due to the outbreak of COVID-19 and work-from-home restrictions, we conducted all sessions virtually through MS Teams. All sessions were video recorded. In total, seven participants were involved. Although there is no recommended participants size stated in the literature, we found small groups is suitable for online workshops to generate fruitful conversations and capture different views as it provides every participant with plenty of opportunities to disagree and discuss (e.g. Eker et al., 2018; Fowler et al., 2019; Wilkerson 2020; Zimmermann et al., 2021). Gatekeepers from the two HAs invited participants within the organisations. Participants include senior leads and managers from regeneration projects and strategy developments from both HAs. Participants held key roles in influencing HAs' responses to housing policies, strategy-making, and daily delivery of large regeneration projects.

Before the first workshop session, we shared a 10-minute GMB workshop introduction video with participants introducing systems thinking and workshop information. The workshop's core questions were: (i) how do policies influence decision-makers' attention to and confidence in considering long-term health and sustainability goals versus short term goals, and (ii) how can the organisation increase confidence in long-term decision-making? Long-term decision-making relates to proactive decisions that focus on social, environmental, and economic ambitions. During the workshop sessions, we explored participants' perceptions of how exogenous policies (such as the National Regeneration Strategy, the Mayor's Guide for Regeneration, the Planning for the Future White Paper, design codes and national and local planning policies) influence decision-making. We also explored how policies and organisational attributes facilitate decision-makers' confidence in incorporating long-term goals into decision-making.

To suit the online format, a conventional full-day GMB workshop was adapted to a series of 60~90 minutes sessions (Table 2 Workshop sessions information). Each session included a series of scripts adapted from Scriptapedia (Scriptapedia Wikibooks contributors 2022). Information on each script is presented in Table 3. Specifically, we started with the session *Identify Problems* with the key gatekeeper from one of the HAs to agree on the modelling problem and questions. The first GMB session produced an initial seed CLD structure, which was shared with another HA via emails to reach alignment. The script *eliciting seed structure* was used in the first session, and all scripts are further described in Table 3. The output structure was also introduced variable-by-variable in the pre-workshop video shared with all participants in advance. The subsequent two sessions *Start Mapping Causal Structure* used two scripts: *variable elicitation* and *mapping from seed structure*. Participants were grouped based on their availabilities. A list of variables relevant to core modelling questions was added. In the following two sessions *Continue Mapping Causal Structure,* we used the script *causal structure mapping*, involving two HAs separately. This further built up the CLDs with a focus on generating feedback connections endogenously. When there is only one participant, the same script was used in group sessions to generate comparable information. We concluded the data collection process with the final session *CLD Validation* presenting and validating the final CLD. The modelling process included two facilitators throughout the sessions. Themes and connections between different parts of the CLD were presented to participants throughout the sessions.

The analysis started between GMB workshop sessions. Research in this stage aimed to compare and aggregate information to produce clear CLDs for the next sessions. This process involved reviewing recordings, checking the variable names, aggregating overlapping links, and sim-

**Table 3**
Description of scripts used in workshop sessions.

| Script name | Description of script |
|---|---|
| Eliciting seed structure | The goal of this script is to generate an initial seed structure, i.e. a very preliminary CLD, to be used as input to the following sessions with all other participants. The modeller shared the screen of a blank Stall page (systems modelling software) and asked the participant to come up with a few key variables and draw the connections. |
| Variable elicitation | The goal of this script is to generate a list of variables related to the modelling problem. Participants had been oriented to the goals of the workshop, and introduced to the concepts of variables, arrows and polarities before the session. The modeller presented the main questions and focus of the modelling problem, and presented the seed structure from the last session. The modeller asked participants to individually suggest 2∼3 variables and share them with the group. The modeller then added variables on a blank sheet of systems mapping software (in this case we used Stella Architect), grouping variables by themes and checking if participants all agreed with the variable name. |
| Mapping from seed structure | The goal of this script is to start CLD mapping from the seed structure and make participants familiar with the process of modelling. The seed structure was presented to all participants. The modeller started to ask if any variables listed can be added to the seed structure. Participants discussed and shared their ideas. When suggesting a link, the participant was asked: if variables connected, direction of the link, and why they are connected. The modeller checked whether all participants agreed on the links. |
| Causal structure mapping | The goal of this script is to build the full causal structure. Similar to the script above, participants discussed and shared their ideas on new links, but beyond the scope of the seed structure. When suggesting a link, the participant would be asked: if variables connected, direction of the link, and why they are connected. The modeller checked whether all participants agreed on the links. |
| Presentation and validation | Between sessions, the modeller cleaned the model, noted areas that need further clarifications. In the last session, the goal was to present the main dynamics identified in the causal structure and validate the model. The modeller presented the model by walking the participants the through the links, one by one, checking if the model represented what they expected from sessions, and asking clarification questions. |

plifying the CLDs. After the final workshop session, which generated the final CLD, the leading modeller refined the final CLD highlighting the critical variable that connects the policies and organisational decision-making. The analysis also included identifying feedback loops (reinforcing or balancing) that drive the system's changes, which allows seeking explanations of the system, looking for influences inside the system. Through further reviewing the recoded workshop videos, links and variable names were also further reviewed. Changes in the CLD are grounded on the original CLD developed at the workshop. Details of the final CLD and feedback loops will be presented in the next section. Core information elicited from GMB informed generating a list of interventions points of policy design, which will be shown in the discussion.

## Results

A CLD was produced from the workshop sessions. The CLD captures six reinforcing loops that were reported to drive long-term and short-term decision-making dynamics in HAs' delivery of sustainability and health outputs in regeneration projects, as shown in Fig. 2. Table 4 describes the main variables in the CLD. The CLD highlights the feedback loops in policy inconsistencies and how HAs build up consistent decision-making, and links with policy outputs. Two outputs were mentioned in the workshop. The first one is *Housing and Community Quality,* which describes the quality of the regenerated housing and nearby community. This incorporates both physical elements such as housing heating, ventilation, green/blue infrastructure, and access to public spaces, and intangible elements such as residents' happiness and wellbeing. Another output discussed is *Attention to Sustainability and Health,* which indicates how much attention organisational decision-makers give to sustainability and health issues. Unlike the first output, which depicts the built environment level, the second output focuses on the individual cognition level. The CLD unfolds from here.

### *Consequences of persisting policy inconsistency*

An important theme at the workshop was policy inconsistency. The first loop (R1: inconsistency persists), shows how policy inconsistencies result from inconsistent government financial decisions, increasing policy inconsistency (see Table 4). Inconsistent decisions are characterised by two features: 1) frequent changes of direction over a short-term time horizon; or 2) disjointed or incoherent objectives internally. Workshop participants from both HAs described national and local health and sustainability policies as "disjointed thinking", "no single cohesive approach", "contradictory or incompatible". For example, as a senior regeneration project manager said:

> "*we have things like [the] Code for Sustainable Homes, which was [a] big flagship policy about delivering carbon zero homes. That got binned very quickly and unceremoniously because of lobbying from the industry. Now we're hearing there is to be no gas boilers in new homes from 2023. There's all this carbon zero pressure on the sector again, so we've completely changed, literally changed direction 180 degrees every couple of years depending [on government].*"

According to participants, housing and planning policy changes in recent decades involve "tweaks to policies that seem to work" and "more and more additional policies overlaid on each other and then further unsettled by temporary wild swings in direction". Participants suggested that inconsistency can be a result of different priorities between the GLA and local authorities. In one example, less parking was required by the GLA as an indicator for sustainable housing, but the local council preferred more parking in the development. Participants felt a "helicopter view or thinking" of sustainability and community health is missing in government policies, resulting in "individual bits of policies around affordable housing or building control, or financial taxation strategies, all of them sometimes working contrary to each other". A lack of coherent thinking in government's planning was perceived to exist because government policies can often have a "short-term focus, such as four-year plans" rather than long-term planning for the next decades.

As one participant described, "policy decisions are based on [the] money they have to spend, but they will also make spending decisions based on what policy they have" with the government "suddenly bashing out" policies. In R1, inconsistent financial decisions include a range of decisions such as taxation, budget, and spending. A regeneration director said that there is a "disparity of political ambition and challenges in reality". Participants also described quick changes in government grants available when the policy direction changes or shifts, which requires decision-makers to focus rapidly on accommodating changes. Another regeneration manager reported:

> "*you have a business plan that's predicated in 30 years and then all of a sudden you know, you lose a huge chunk of money you were counting on. Those are variables that sort of get your attention.*"

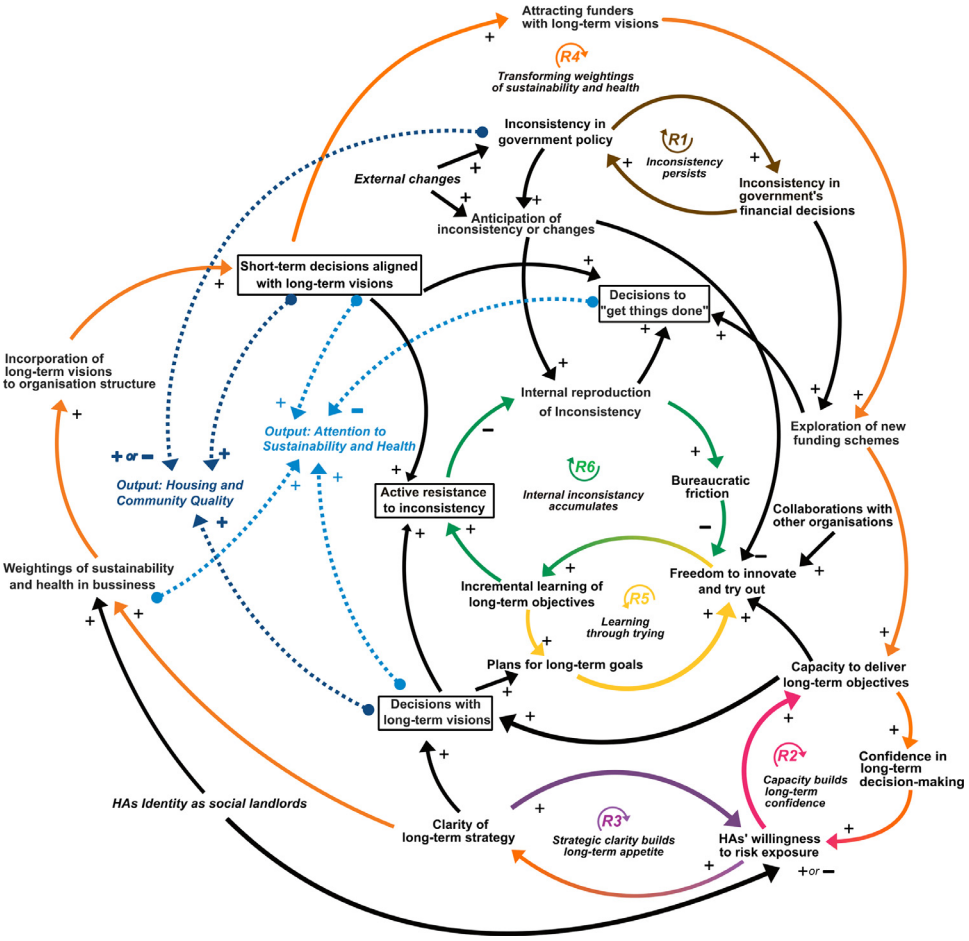


**Fig. 2.** A CLD of the dynamics of housing policy changes and HAs' decision-making. *Note*: 'R' represents 'reinforcing' loops, meaning that an increase (decrease) of one variable would trigger an increase (decrease) of this variable after travelling the full loop. A positive (+) sign implies positive arrow polarity, meaning that an increase (decrease) in the cause variable will result in an increase (decrease) in the effect variable, compared to what would have been otherwise and if everything else stays the same. A negative (-) sign implies positive causality, meaning that an increase (decrease) in the cause variable will result in a decrease (increase) in the effect variable, compared to a what would have been otherwise and if everything else stays the same.

**Table 4**
Definitions of main variables in the CLD.

| Variables in the CLD | Definitions |
|---|---|
| Active resistance to inconsistency | Decisions that represent the organisation's own aspirations or commitment to long-term directions regardless of external environment changes. |
| Anticipation of inconsistency or changes | Decision-makers' perceptions and predictions of future inconsistency or changes. |
| Clarity of long-term corporate strategy | Transparent and clear long-term business directions. |
| Decisions to "get things done" | Rapid, reactive, or responsive firefighting decisions to resolve day-to-day or immediate issues. |
| Decisions with long-term visions | Proactive decisions focusing on implications emerging over the next few decades. |
| Exploration of new funding schemes | Exploration of subsidy and funding opportunities include bond, equity, and investment market in the industry. |
| External changes | An aggregation of external events such as industry trends, technology changes, demographic changes locally, climate change, public crisis events (COVID-19). |
| Freedom to innovate and try out | Flexibility in innovating and trying out new ideas in regeneration projects. |
| HAs' willingness to risk exposure | HAs' commitment to take financial and reputational risks in long-term decisions. |
| Inconsistency in financial decisions | Frequent changes or disjointed patterns in financial decisions such as taxation, spending and budget at national or local government level, or a discrepancy between spending plan and actual spending. |
| Inconsistency in government policy | Frequent changes in housing and planning policy directions or disjointed policy objectives across departments, or between the national and local levels. |
| Internal reproductions of inconsistency | Internal decision tensions manifested as frequent changes in long-term directions, priorities, agenda, rules, structures, values and models of delivery. |
| Short-term decisions aligned with long-term visions | Short-term decisions that are formulated around the daily delivery of long-term strategies. |
| Weightings of sustainability and health in business | Decision-makers' recognition of the importance of long-term goals, or tangible measurements on the intangible goals. |

Participants described a range of other *external changes,* including changes in technology, industry trends, demographic changes, crisis events etc. The *anticipation of inconsistency or changes* (see Table 4) describes decision-makers' perceptions and predictions of future changes. The variable *internal representation of inconsistency* is the crucial variable that connects policymaking and organisational decision-making, describing tensions manifested in organisational priorities, agenda, focus, and underlying values. Participants described that R1, with *external changes* as "shocks", can increase decision-makers' *anticipation of inconsistency or changes,* increasing the HA's *internal reproduction of inconsistency*, and increasing *decisions to "get things done"*. Participants used "decision to get things done" to describe decisions that are rapid, reactive, or responsive to resolve daily or immediate issues. They stated that not all policy changes are undesirable, but the changes can be disruptive to existing organisational plans and result in a responsive mode of decision-making. As a strategy expert said:

> "*decisions to get things done has a sense of quite often firefighting about things. I mean, it's different [from] actually trying to make some real fundamental structural changes …*"

Participants also suggested when short-term decisions dominate daily decision-making, individuals have little attention left to pay to sustainability and health goals. Thus, as shown in the CLD, *decisions to "get things done",* directed by *internal reproduction of inconsistency,* can decrease the output variable: *Attention to Sustainability and Health* as the managers' decision-making is "dominated by short-term stuff". Another pathway, suggested by participants from HA-A, is that frequent financial pressure from R1 leads HAs to *explore new funding schemes* in the market to stabilise long-term financial options to deliver the HA's sustainability and health goals.

The links between *inconsistency in government policy* and output *Housing and Community Quality* remains uncertain. The arrow polarity depends on whether HAs and developers can accommodate the changes and "workaround opportunities", or if the industry has new and long-term type funding schemes available. For example, participants from HA-A mentioned the availability of funding via ESG investment bonds in the industry sector, which supports long-term sustainability delivery. As a result, inconsistency resulting from policy changes can provide both opportunities and challenges for considering long-term decisions.

### *Building long-term visions in decision-making*

Participants had rounds of discussions on internal organisational responses facing external inconsistencies. The second loop (R2: capacity builds long-term confidence) describes one of the key pathways to build long-term visions: increases of *capacity to deliver long-term objectives* (see Table 4) from new funding schemes boosts decision-makers' *confidence in long-term decision-making*, building up the *HAs' willingness to risk exposure*. R2 suggests financial or reputational risks are associated with long-term decision-making. Although participants agree on the loop R2, there were contradictory views on how HAs' identity as social landlords influences the willingness to take risks. A regeneration manager from HA-A stated:

> "*.. we have committed to what we call [name of HA-A's long-term plan], which is all about the of quality of life of our residents…so we're going to lose another £20,000,000 on this [name of a new development], but we as an organization have committed to doing this [the new development].*"

While the strategy lead from HA-B said:

> "I think it's the type of organization… a private developer [who] has the ability to task can be a bit riskier on certain things, but with [name of HA-B] there's a reputational issue…, principally we are a social landlord, and that's what we do, so we have to protect existing and vulnerable residents. "

In the CLD, we added a sign of *"+ or –"* to the link to highlight how the different perceptions of HAs' identity and value may influence the *willingness to risk exposure*. Further, the third loop (R3: strategic clarity builds long-term appetite) describes another way to build long-term vision by increasing *clarity of long-term strategy* (see Table 4). Corporate strategy was identified as a critical variable in organisations' ability to increase *decisions with long-term visions* and shape individuals' *weighting of sustainability and health in business* (see Table 4). Strategy development was described as "what we want to do, to resist some of the pressures (of policy inconsistency)." "Strategic direction" helps the decision-makers define strategic goals and articulations of grand goals. As a regeneration manager said:

> "*I think the strategic direction gives us a very strong basis to work up detail and approaches on the back, as you would expect.*"

Connecting R2 and R3, the fourth loop (R4: transforming weightings of sustainability and health) describes transforming long-term goals to *short-term decisions aligned with long-term visions*, with new funding schemes. *Weightings of long-term goals* can be individual or group recognitions, or tangible measurements towards long-term goals which themselves are often intangible. The Environmental Social and Governance (ESG) bond was mentioned by HA-A suggesting the benefits of how new financing sources require reporting long-term decisions. ESG bonds underline the demand to deliver environmental and social principles, which leads the organisation to incorporate the long-term environmental and social investment into daily decision-making and performance measurement, increasing the *output Housing and Community Quality*. As one participant from HA-A said:

> "*we talked about it in the past in terms of how do we quantify these intangibles in a way. And I'm a firm believer of, you know, you measure what matters, but equally what matters are the things that you can actually measure easily, and that's why the ESG reporting is so important.*"

R4 highlights the complex relationship between short-term and long-term decisions. As a regeneration manager from HA-B described, the delivery of overarching plans includes decisions at different levels:

> "*often, particularly in regeneration it gets down to the level of detail of a red line… We will then hand that [overarching plan] over to our delivery colleagues with a full brief and they will deliver it to the brief … It's a question of density, site context, and finance. And when it gets down to that level, I think it really follows those things very closely, but I think at the level above that, we've got an opportunity to think much more strategically in terms of place.*"

Thus *short-term decisions aligned with long-term visions* at multiple levels across finance, delivery and design teams can help HAs attract funders with long-term visions, facilitating the exploration of new funding schemes, which closes the loop R4. For links to outputs, decisions with long-term elements increase the *output: Quality of Housing and Communities*, balancing the potential consequences resulting from policy inconsistency. Long-term visions to health and sustainability increase individuals' perceptions of long-term values and trends, driving more attention to long-term issues. Thus, decisions with long-term elements can also improve another *output: Attention to Sustainability and Health.*

### *Active resistance to inconsistency*

Although government policy seems to make a strong statement around sustainability and health, and the HAs value long-term visions in projects, "being able to see what drives the (long-term) decisions is not quite clear", as one participant said. As mentioned, accumulations of the internal reproduction of inconsistency can lead to a clash of values, and tensions in long-term decisions. Participants mapped the pathways to how to build *active resistance to inconsistency* (Table 4). The *resistance* variable captures the HAs' aspirations or commitments towards a long-term vision. For example, participants framed the resistance as "what

do we as an organisation want to achieve around carbon", "long-term plans which we think are right given evidence", and "what do we want to do". R2, R3 and R4 provided indirect strategic level pathways to resist accumulations of the *Internal Reproduction of Inconsistency* through building up long-term visions.

Furthermore, the final interconnected two loops (R5: learning through trying, and R6: internal inconsistency accumulates) mapped the importance of incremental learning. Firstly, for R5, *long-term decisions* set *plans for long-term goals*, increasing the *freedom to innovate and try out* projects that build incremental learning. R5 can be activated by the capacity to deliver (R2: capacity builds willingness) and corporate strategy with clear long-term visions (R3: strategy sets long-term willingness). Secondly, for R6, with *incremental learning on long-term visions* growing, the organisation can *actively resist the inconsistency* and decrease *bureaucratic friction* such as administration barriers, increasing innovations and new ideas. *Freedom to innovate and try out* links R5 and R6. Particularly for large-scale housing projects including blue/green infrastructures, as described by the regeneration strategy lead:

> "*because of the scale, we do not have the red boundary of what to deliver, so there is a level of softness and responsiveness to test and try out stuff*".

Participants listed a range of variables that influence the freedom to innovate, such as the project lead's reputation as a trusted actor, flexible corporate structure, and the extent to which the pilot project fits the organisation's perspective. Specifically, participants from HA-B mentioned that evidence, public data and knowledge acquired by collaborating with other stakeholder groups can boost the incremental learning process. However, collaborations and external changes were perceived as exogenous variables, indicating they cannot be changed by any other variables in the CLD. Also, a participant said a potential risk of trying out is that "it does not work and there is a potential over time that you will just ignore opportunities because you will think you do not want to waste time on that".

Participants stated that HAs' active resistance to inconsistency can be constrained by regulations that HAs need to follow. For example, one participant described the resistance as "we are doing it regardless, but we might do it at a different sale or at a different time (as policy changes)". Resistance also needs to consider the alignment of the organisation's and government's long-term plans as it can require lots of resources and capacities. HA-B framed it as matching opportunities with external environment: "If you have a set of approaches in place, so that when opportunities come up, we got them ready to go".

In sum, inconsistent policy changes could pressure HAs to accommodate changes, leading to an unintended consequence of jeopardising the housing and community quality and attention to sustainability and health, which are two outputs in the CLD. Reinforcing dynamics of policy inconsistency (R1) increase internal reproduction of inconsistency, leaving tensions between long-term and short-term decision-making. Within the HAs, a clear organisational strategy (R3) with sufficient financial and human resource capacity (R2), can increase decision-makers' weighting of organisational actions on sustainability and health in decisions (R4). At the project level, incremental learning (R5 and R6) actively resists decision tensions arising from the internal reproduction of inconsistency.

## Discussion

We elicited a qualitative CLD that describes the interconnections of housing policies and HAs' decision-making through participatory GMB workshops with two HAs. We found that accumulations of policy changes unintendedly facilitate HA's short-term rather than long-term decision-making, risking the delivery of healthy and sustainable housing. We argue that the CLD provides a basis for better policy making by highlighting how policy affects the HAs' decision-making and their incorporation of sustainability and social goals. In this section, we discuss our contributions. We start with discussing the influences of policy making on HA's decision-making and unintended consequences, contributing to the housing and HAs literature. Then we discuss how the systems thinking approach can incorporate complex causal mechanisms in policy design, contributing to the integration of policy design and soft OR research. Specifically, drawing from the causal mechanism in our CLD, we identify specific interventions incorporated into policy design by activating endogenous loops and mechanisms. Finally, we summarise limitations and implications for future research.

### *Policy changes, decision-making and unintended consequences*

The CLD revealed that inconsistent policy changes and HA's internal reproduction of policy changes are closely linked with HAs' decision-making. We identified three types of decision-making in the CLD: decisions to "get things done", decisions with long-term visions, and short-term decisions aligned with long-term vision (see Table 4).

We found that inconsistency resulting from disruptive events or disjointed thinking has an accumulative nature. The accumulation of policy changes has lasting and interconnected effects in the system, manifesting itself in many forms such as conflicts in cultures and values, and tensions in long-term versus short-term decision-making, as the CLD suggests. In alignment with research on HAs as hybrid organisations, which views HAs as facing contradictory institutional logics between delivering social outputs and addressing market efficiency (Battilana, 2018; Pache & Santos, 2013), we found a strong perception among the HA representatives in the case study that frequent or disjointed shifts in external policy and other changing environments can potentially drive their decision-making towards decisions to "get things done", which is a firefighting mode rapidly reacting to immediate changes. Participants from both HAs described a paradoxical approach to decision-making, transitioning between short-term and long-term modes of decision-making (Smith & Cunha, 2020). We found that internal inconsistencies can further reinforce the tensions of values between market and social housing, restricting decision-makers' exploration of long-term objectives.

We also found that disruptive changes can potentially create windows of opportunity as critical juncture moments, depending on whether the HAs can make decisions with long-term visions, or incorporate long-term visions in short-term decisions. Inclusion of long-term visions is dependent on strategy clarity, funding schemes, and if HAs can build active resistance to policy inconsistencies. 'Critical junctures' represent intersections of policy streams before new policy pathways or new streams dominate and open up options (Howlett et al., 2017; Howlett, 1998). Several loops (R2 to R5) in the CLD suggest potential opportunities for incorporating long-term decision-making during policy change moments, considering the decisions' implications over the next few decades. The CLD further suggests helping organisations build long-term financial capacity would be vital to introducing any transformative or innovative changes to the system. Critically, strategic or capacity level change depends on the availability of funding. Increasing strategy-level clarity and capacity, and building knowledge around long-term goals can facilitate HAs consider the implications of decision-making over the next few decades. However, the CLD highlights that decision-makers' anticipation of frequent changes can increase decision-makers' focus on reactive firefighting decision-making. Also, the time needed to build capacity and learning, and develop strategic directions can delay delivering desired social outputs, which is aligned with the policy literature that policy changes can prevent 'policy lock-ins' by generating new policy pathways (Grabher, 1993) or risk sustained learning and creation (Moodysson et al., 2017).

Specifically, two unintended consequences of frequent policy changes were identified in the CLD: 1) increasing HA's short-term rather than long-term decision-making, and 2) potentially jeopardising the delivery of sustainability and health outputs. Firstly, we identified in the CLD that policy changes, although exogenous, can pose a relatively fast pressure to the system that the decision-makers need to respond to quickly, resulting in a short-term focused decision-making trajec-

tory. Regarding policy changes in the built environment, Gallent and Carmona (2004) suggested that policy changes in the planning system may create a range of pressure points and frictions between housing providers and local planners across development stages. Competing government agendas such as maintaining a local safety net of social housing versus encouraging mixed tenures could create tangible and enduring conflicts in practice (Fitzpatrick & Pawson, 2007). The CLD indicates that disruptive or disjointed policy changes can accumulatively increase decision-makers' inconsistency in decision-making, risking the attention to long-term goals and the delivery of healthy and sustainable housing. Secondly, we found that inconsistency in policy can potentially decrease the quality of sustainable and healthy housing if HAs do not consider the long-term impact of firefighting decisions. For example, procurement decisions contain opportunities to include sustainable materials to improve housing sustainability, requiring attention to long-term visions. And the design decisions need to balance between good ventilation for health and increased air tightness for energy efficiency, demanding decision-makers' attention to consider and balance trade-offs. As policy inconsistency hamper decision-makers' attention to long-term goals, we support Manzi and Morrison's (2018) finding that policy inconsistencies can risk the organisation's capacity to provide quality housing, or potentially worsen social housing affordability. The CLD provides a important basis for better policy making by highlighting how policy making affects the HAs' decision-making and their incorporation of sustainability and social goals.

*Incorporating systems thinking and organisational responses in policy design*

The CLD describes the interlinkages between policy design, specifically inconsistencies and changes, and housing organisations' decision-making, highlighting the importance of holistic policy design that supports HAs' decision-making for sustainability and social issues more strongly. A key contribution of this study is to advance the exploration of how to include complex causal mechanisms (Capano and Howlett, 2019) and decision-making into policy analysis and design (Ferretti et al., 2019; Pluchinotta et al., 2019). We summarised a systems thinking approach in policy design in Fig. 1. Based on the causal mechanisms from the CLD, we describe policy design elements that need to be considered (see Fig. 3), which are linked with the causal mechanisms identified in Fig. 2.

Two policy outputs are considered in Fig. 3: housing and community quality, and HA's attention to sustainability and health. As shown, the achievements of policy outputs depend on HAs decision modes: decisions to "get things done", decisions with long-term visions, and short-term decisions aligned with long-term visions. As discussed in Section 6.1, the firefighting decision-making mode (decisions to "get things done") can potentially introduce unintended consequences that compromise policy outputs. Fig. 3 lists the critical causal mechanisms that need to be considered in policy design. In the CLD, R1 and R6 are directly linked with the HAs' responses to disjointed and inconsistent policy changes. Weakening R1 and R6 can potentially decrease HAs' firefighting-only decisions reacting to external environment changes. The delivery of policy outputs depends on the availability of alternative financing options in the sector, and whether HAs can build consistent long-term decisions. Considering the reinforcing nature of policy inconsistency (R1), a viable intervention might be government introducing the long-term visions and financial options especially during policy changing moments. Diverse financial options such as public grants, commercial or private funding, equity, bonds can potentially increase HAs' and other housing developers' confidence in financial capacity and long-term decisions, expanding the housing and community quality in the long term. Long-term visions and measurements can clarify the long-term strategy within the HAs.

Our CLD reveals multiple pathways for HAs to incorporate long-term visions over time (R2, R3, R4, and R5). Strengthening these pathways can incur critical second-order feedback mechanisms that can generate compounding effects within the system (Capano, 2019). Considering the interconnections between R2, R3 and R4, it would be critical to consider HAs' long-term strategy, financial capacity, and long-term goals' weightings as a whole. The CLD suggest the potential chances of long-term decision making if policy-makers facilitate the development of specific measurements for long-term goals, which can be used in policy guidance, funding or grants requirements, or HAs' internal strategies. Also, the allocation of alternative financing schemes could facilitate HAs to increase capacity and confidence in long-term decision-making. Clear strategies that bridge the organisation's goals and policy targets could provide the vocabulary to communicate long-term objectives. Housing policy design might also benefit from considering the importance of learning and knowledge building. Our CLD suggested that R5 and R6 are interconnected and can be activated by increasing financial capacity via R2. Piloting and testing ideas seem critical for HAs to develop incremental learning around long-term goals, which aligns with Pineo and Moore's (2021) finding that practitioners' evaluative and reflective learnings are important for building healthy places. Thus, we argue that policy-makers need to synthesise and diffuse learnings across the sector. However, we noted that delays often characterise long-term decision-making pathways (Rahmandad, 2008; Rahmandad & Gary, 2020). Building capacity, strategy and learnings require aligned values and actions internally and take time. Thus, we also think it is essential to create opportunities to align goals between government and HAs, building up learnings in the complex urban health and well-being system as a whole (Gatzweiler et al., 2017; Meadows, 2008; Stave, 2010; Zimmermann et al., 2018).

*Limitations and implications for future research*

One limitation of the case study is that a small number of participants developed the CLD. However, the participants are from two large influential HAs, with extensive experience working in regeneration project management and strategy development in the HA sector. Past GMB cases have also demonstrated how small numbers of participants can still generate generic learnings about the system (e.g. Eker et al., 2018; Fowler et al., 2019; Vennix et al., 1996; Zimmermann et al., 2021). Thus we believe the CLD is useful and can be tested with other HAs in the sector. Another limitation is that we did not focus on a specific housing policy design, and the impact of organisational responses on policy changes is not considered, that is, that the CLD did not describe how decisions from HAs can shift policy changes. However, the strength of this study is the in-depth focus on the consequences of frequent and disjointed policy changes, demonstrating the importance of incorporating systems thinking in policy design. Though inferring systems behaviours from CLDs is challenging without simulation models (Richardson, 1997, 1986), we believe the analysis of different types of decision modes and loops provides systems insights for understanding the connections between policy design and outputs.

For future research, we recommend further investigating the nature of policy changes and consequences on HAs' decision-making and policy outputs. In practice, while increasing consistency of government financial decisions can facilitate HAs following a specific policy agenda more easily, this can be a complex process (e.g. spending programs alter as any new government attempts to 'fix' problems in past policies). Therefore, future research can continue exploring the nature of policy changes on organisational decision-making. Also, our CLD cautions that rapid and inconsistent changes may lead organisations to respond too quickly, jeopardising attention to sustainability and health in the long term. It is unclear how recent changes in planning procedures (MHCLG, 2021b) can influence policy outputs. Building on the policy interventions we proposed, future research can continue to explore what other policy interventions are needed to help HAs and developers build long-term decision-making during policy change and critical junctures.

Another critical area of future work is replicating and refining the systems thinking approach in policy analysis and design. Our study ex-

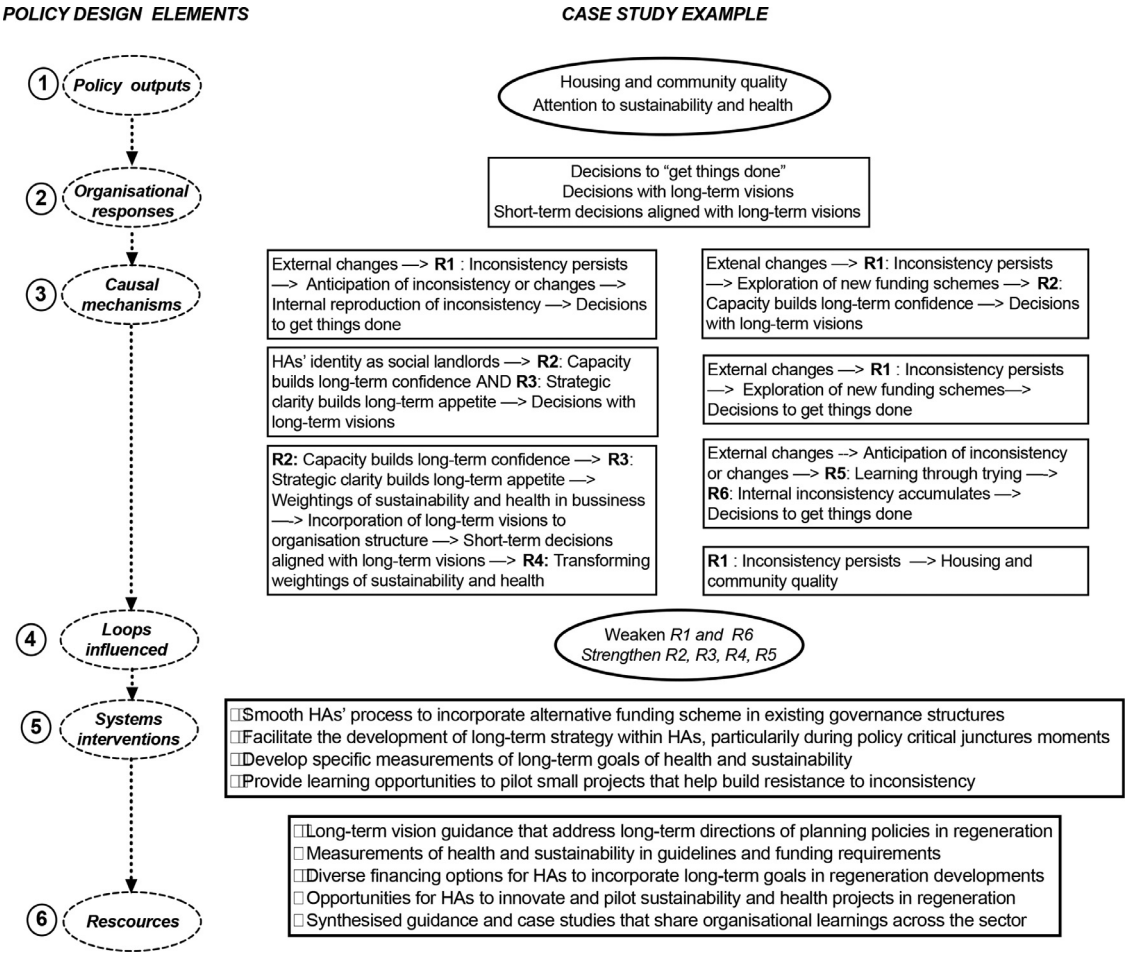


**Fig. 3.** Systems thinking approach in policy design: the case study example.

plored how CLDs elicited from GMBs can be used to generate insights informing policy design. As the elicited causal mechanisms are grounded in a small participatory study, future research can further tested with other HAs or housing developers. Most importantly, we stress the influence of policymaking on HAs organisational level decision-making and provide a system thinking approach in policy design. Future research can further test how the systems approach can be used in various policy-making processes and facilitate endogenous changes or maximise opportunities for achieving policy targets. Finally, workshop sessions were moved online under the work-from-home restrictions, thus posing multiple workshop design and facilitation challenges. Instead of developing a full-day scripted activity as the conventional method, we had multiple short sessions with participants to adapt to the virtual platform. Although the modelling process could be video recorded, allowing for detailed data analysis, it required longer time to recap last session's content at the start of each session. Facing uncertainties of COVID-19 and potential new norms on working-form-home, future research needs to explore and develop scripts that smooth the process of virtual participatory workshops (Wilkerson 2020; Zimmermann et al., 2021).

## Conclusions

We presented a study exploring a systems approach in policy design that considers the interlinkages between policy design and HAs' decision-making. The CLD produced with employees of two HAs in England shows that disjointed and frequently changing government policy (and other external changes) can fail to achieve the policies' intended quality of housing and community by disrupting the organisations' ability to incorporate long-term goals in decision-making. Inconsistent policy changes and reproduction of policy changes can accumulate and create entrenched challenges for decision-making over time by increasing the tensions in long-term versus short-term decision-making. Drawing from the policy design and soft OR literature, we proposed a systems-thinking approach to reflect on policy design and organisational decision-making. We highlight the importance of considering unintended consequences of frequent and disjointed housing policies, and interventions that address the consequences. We have made two main contributions: firstly, past housing association studies focus on the competing institutional perspectives but missed the accumulation nature of policy changes and how the complexities influence the decision-making. We contribute to the housing policy and HAs literature by explicitly showing the impact of accumulative policy changes on decision-making. Secondly, policy design and soft OR research have an overlapping interest in including the causal mechanisms of the problem in policy or intervention design, but the theories and tools facilitating the inclusion of systems thinking is limited in policy design. We contribute to integrating soft OR and policy design literature in understanding how a systems thinking approach can help the process of holistic policy design. We argue that effective policy design should incorporate systems perspectives regarding the complex connections between policy issue, actors' responses such as decision-making modes, and the intended policy goals. Therefore, systems thinking approach in policy design can effectively facilitate endogenous changes and maximise opportunities for achieving policy targets.

## Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Author contributions

Conceptualization, K.Z., N.Z., and E.W.; methodology, K.Z and N.Z.; workshop facilitation: K.Z and N.Z.; data analysis and writing, K.Z.; reviewing and editing, K.Z., N.Z., E.W., H.P., M.U., and M.D. All authors have read and agreed to the published version of the manuscript.

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