Dynamics of Place-based Decision Making:

A systems approach to leverage social housing regeneration for health and sustainability

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UCL

Doctor of Philosophy

I, Ke Zhou, confirm that the work presented in this thesis is my own.

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Abstract

Urban regeneration aims to rejuvenate the physical environment, socioeconomic conditions and environmental quality of an urban area. While regeneration measures are typically expected to improve population health, well-being and sustainability, the evidence regarding regeneration impact is mixed. Despite the availability of decision-making tools that emphasise sustainable development in regeneration, it is unclear how decision-making on urban regeneration can improve outcomes.

This research investigates the complexities and dynamics of organisational decision-making regarding regeneration initiatives. It aims to uncover the interconnections between decision-making and regeneration. This research focuses on English housing associations (HAs) as critical decision-makers in social housing regeneration. The study combines multiple systems tools, including developing causal loop diagrams (CLD) from qualitative analysis, system dynamics (SD) simulation modelling and group model building (GMB) workshops. It presents three empirical models including two CLDs that investigate the dynamics of decision-making in HAs, and a theory simulation model focusing on the competition between social missions and market logic.

This research stresses that attention is a limited resource in decision-making. It highlights the structural complexities between social missions (health, well-being, and sustainability) and financial considerations in regeneration initiatives. It shows that the complexities that arise from tensions in decision-making can pose a high risk of mission drift when decision-makers fail to sustain attention to social missions. Additionally, disjointed policies and regulations that fail to incorporate organisational dynamics can trigger short-term decision-making rather than long-term decision-making. To sustain attention to social missions in regeneration, decision-makers need to focus on the structural connections between various logics in regeneration.

This study develops multi-level conceptualisations of the problem of interest, thereby contributing to exploring systems approaches in urban environment-related decision-making and policy-making. It discusses synergies between the empirical models, and strategies to sustain decision-maker's attention to health, well-being, and sustainability in regeneration. Areas of further research are identified.

Impact Statement

This research on the dynamics of decision-making in the context of urban regeneration has value for researchers and practitioners in the fields of urban planning, public health, and policy making.

Firstly, the research has impacted the field by contributing knowledge and supporting decision-makers' decisions in optimising the impacts of urban regeneration. The application of systems thinking and systems dynamics modelling captured multi-level complexities of HAs' decision-making in social housing regeneration projects. The researcher has already disseminated the findings to inform urban regeneration activity in the United Kingdom (UK) and Europe (EU). The research was presented directly to the European Federation for Living (EFL), which is a network of over 70 housing providers, companies, and universities across the EU through which members share insights, information, and expertise. The research has been digitally disseminated via a blog which summarises the main insights regarding systems-based policy design (Zhou et al., 2022).

Secondly, for impact in academia, the impact is concerned with multi-disciplinary knowledge and methodological innovations. The findings contribute to the integration of knowledge development within urban environmental decision-making, organisational management (and institutional analysis), public health, and urban planning. The integration of policy design, systems thinking tools, and qualitative analysis has contributed to a multi-level analysis. The research has been disseminated through one peer-reviewed journal publication, two conference papers, and multiple conference presentations (see Thesis Associated Publications). The conference presentations particularly focus on sharing the methodological innovations in the field of soft operational research, system dynamics, and organisational research. In addition to the conference presentations and publications, the research findings have informed lectures at the Institute of Environmental Design and Engineering (IEDE). The research has also been presented to the cohort of the National Institute for Health and Care Research (NIHR) School for Public Health Research (SPHR).

Thirdly, for implications in practice, the impact of this research on academic researchers and decision-makers in the regeneration industry can improve health and sustainability outcomes. The analysis at the organisational, cognitive, and policy level contributes to the development of a holistic approach to urban regeneration. The findings suggest that

devoting attention to sustainability, health, and well-being is challenging when multiple logics compete, and the consistent shift in focus towards financial performance and health can jeopardise sustainable development in regeneration projects. Additionally, the disjointed and ever-changing nature of policies and regulations can pressure decision-makers to focus on short-term rather than long-term decision-making. Therefore, the key implication is that decision-makers should consider systems-level complexities related to regeneration, address the competition between multiple goals throughout a regeneration project's stages, and remedy the structural tensions between social missions and economic performance goals over time to maximise regeneration outcomes.

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List of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

AT	Adjustment time
ABV	Attention based views
B	Balancing
C	Charity
D	Designer
BREEAM	Building Research Establishment Environmental Assessment Method
CLD	Causal loop diagram
COVID-19	Coronavirus disease
DCLG	Department for Communities and Local Government
DDA	Dutch District Approach
DSHWS	Demand strength of HWS
DLUHC	Department for Levelling Up, Housing and Communities
DMNL	Dimensionless
DSMarket	Demand strength of Market
EFL	European Federation for Living
EPC	Energy performance certificate
ESG	Environmental social governance
EU	Europe
GHQ-12	General Health Questionnaire 12-item
GLA	Greater London Authority
GMB	Group model building
GoWell	Glasgow Opportunities for Wellbeing, Wealth, and Work
HA	Housing Association
HHSRS	Housing Health and Safety Rating System
HWS	Health, well-being, sustainability
IEDE	Institute of Environmental Design and Engineering
LEED	Leadership in Energy and Environmental Design
MHCLG	Ministry of Housing, Communities & Local Government
MHI-5	Mental health inventory-5
NDC	New Deal for Communities
NIHR	National Institute for Health and Care Research
NPPF	National Planning Policy Framework

NR	Neighbourhood Renewal
PhD	Doctor of Philosophy
OR	Operational research
R	Reinforcing
RM	Regeneration management
RQ	Research question
RP	Registered Provider
RSH	Regulator of Social Housing
RTB	Right to Buy
S	Sustainability
SC	Sustainability consultant
SD	System Dynamics
SDG	Sustainable development goal
SHARP	Scottish Housing, Health, and Regeneration Project
SF-12v2	Short Form Health Survey version 2
SPHR	School for Public Health Research
SR	Strategy and research
UCL	University College London
UK	United Kingdom
WHO	World Health Organisation

Thesis Associated Publications

Peer-reviewed publications:

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Presentation to Public health Research and Science Conference. 'A system dynamics simulator to support decision-making on the regeneration of housing for achieving health and sustainability value'. 2021. Virtually in UK.

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CHAPTER 1

Introduction

'Today's world is shaped not by individuals alone, but by the networks of business and governmental and non-governmental institutions that influence the products we make, the food we eat, the energy we use, and our responses to problems that arise from these systems.'

-Peter Senge (2008), The Necessary Revolution

1.1 Introduction

Places are more than merely physical environments; they are also socio-physical constructs that involve shared habitation. Urban areas comprise structures, roadways, places, landscapes, and communities in which health, social, economic, and environmental outcomes and the location quality define and support one another (Carmona, 2019). The World Health Organisation's (WHO) (2018) guidelines regarding healthy housing explicitly link improving housing conditions to achieving Sustainable Development Goals (SDGs) regarding health and well-being (SDG 3) and sustainable cities and communities (SDG 11). The impact of housing conditions on health and well-being has been well-established (Baker et al., 2016; Burridge & Ormandy, 1993; Shaw, 2004; Thomson et al., 2013). Sustainability strategies in cities, such as reducing greenhouse gas emissions, can also confer opportunities or co-benefits related to the urban population's health and sustainability (Hiscock et al., 2014; Jonathon et al., 2018; Wilkinson et al., 2007, 2009; Winston, 2010).

Urban regeneration, as a specific place-based solution, aims to facilitate various opportunities to improve public health, reduce health inequalities (Thomson et al., 2006) and address environmental challenges (Evans, 2012). Studies suggest that housing improvements, in particular, can improve housing quality, providing crucial opportunities for delivering health and sustainability goals (Hiscock et al., 2014; Jonathon et al., 2018; Wilkinson et al., 2007). However, while regeneration is an internationally popular policy for achieving along social, economic, and environmental dimensions, the evidence regarding improvements in health, well-being, and sustainability is mixed (McCartney et al., 2017; Thomson et al., 2007).

The complex causal mechanisms of health improvement in regeneration projects have increasingly been highlighted (Thomson & Thomas, 2015; Walthery et al., 2015), pointing to a holistic or systems-based decision-making approach (Kearns et al., 2021; Macmillan et al., 2016; Sharpe et al., 2018; Zimmerman et al., 2018) which considers interlinkages and co-benefits across sustainability and health (Hiscock et al., 2014; Jonathon et al., 2018; Wilkinson et al., 2007). The holistic approach considers the broader connections between sustainability and health, requiring decision-makers' attention across multiple domains.

However, decision-making theories suggest that attention is a limited resource (Simon, 1957) and that the issues and answers that decision-makers focus on determine their decision-making (Ocasio, 1997). Despite the availability of decision-making tools that stress sustainable development in urban regeneration (Huang et al., 2020; Marta et al., 2017; Peng et al., 2015), the risks associated with mission drift have been highlighted when organisations fail to balance their attention in response to multiple missions (Ebrahim et al., 2014; Ometto et al., 2019) or tensions related to regeneration (Slawinski et al., 2019).

This research explores the role of decision-making in large regeneration projects involving social housing developments, with a focus on the impacts on health, well-being, and sustainability. This research emphasises the complexities and dynamics of decision-making and argues that systems-based approaches are necessary to enhance the overall health, social, and environmental outcomes of regeneration projects. Based on case studies regarding the housing-led regeneration of social housing developments in England, this research discusses general decision-making challenges and approaches to enhancing regeneration outcomes. This chapter introduces the thesis by outlining the basis for this research and its central questions, aims, and objectives. The novelty of the research is summarised. Finally, the thesis structure is explained to aid readers in navigating the document.

1.2 Basis for research

This section introduces the basis for researching decision-making in relation to urban regeneration and explains why a systems approach is necessary.

1.2.1 Urban regeneration

Urban regeneration refers to revitalising or rejuvenating an urban area by improving the physical environment, socioeconomic conditions, and environmental quality (Couch & Dennemann, 2000; Egan et al., 2015; Lawless et al., 2010). The core proposition of urban regeneration is that urban improvement serves as an approach to addressing social, economic, and ecological problems within a locality (de Magalhães, 2015); it aims to enhance health and well-being (Thomson & Thomas, 2015) and sustainable development to foster long-term resilience and growth (Couch & Dennemann, 2000; Evans, 2012).

Regeneration can be achieved through various means, including the construction of new buildings and infrastructure, the rehabilitation or restoration of existing buildings, the development of public spaces and policies, and programmes to promote economic growth and social well-being. Specifically, area-based initiatives focus on providing various forms of support to improve the economic, social, or environmental outcomes within the area (e.g. Kearns et al., 2020; Kramer et al., 2014; Stafford et al., 2014). Property- or housing-led regeneration, which involves large-scale housing clearance, demolition, and new developments and which can be led by the state or the private sector, focuses on the improvement of properties without additional considerations of environmental or amenities improvements or education and training opportunities to benefit tenants' health (e.g. Thomson et al., 2007). Depending upon the narratives surrounding regeneration projects, as indicated in Table 1-1, the priorities can differ in urban regeneration from focusing on properties and buildings to focusing on urban, cultural, and community-level dynamics (Colantonio & Dixon, 2011).

Table 1-1: Diverse priorities in urban regeneration. Note: source (Colantonio & Dixon, 2011)

Narrative or approaches to regeneration	Priorities of regeneration
Property-led physical approach	Development of major retail-led or mixed-use properties
Business-driven approach	Business investments for 'underserved' inner-city areas
Urban form and design	Sustainable developments and urban form explorations
Cultural industry	Creative and cultural industry

Health and well-being	Well-designed spaces and connections to neighbourhood health and liveability
Community-based approach	Local community engagement and social capital networks

1.2.2 Challenges of urban regeneration for health and sustainability

While regeneration projects or initiatives aim to be holistic, the impact of diverse activities (physical, services, economic, social, and psychosocial) on health and well-being can vary (Kearns et al., 2021). Additionally, tensions between various focuses on regeneration can even trigger place-based tensions between ecological, social, and economic goals (Slawinski et al., 2019). Within the framework of urban regeneration, place-making focuses on the distinctive qualities and demands of the local area to offer specialised solutions to regional issues (Public Health England, 2021). Place-based decision-making thus needs to consider both the community assets and the overall complex and interwoven social, economic, and environmental concerns to create sustainable, inclusive, and thriving communities. Overall, several areas within urban regeneration compromise the decision-making and health and sustainability outcomes.

The complexities of trajectory changes in health and wellbeing. The first area concerns the mixed or inconsistent results of health outcomes and complex trajectories in relation to health and well-being. Although cross-domain aims towards regeneration, mixed results have been reported regarding regeneration projects' impacts on health improvement (Thomson & Thomas, 2015) and health conditions or health inequalities (Thomson et al., 2006). One reason is that internal housing conditions, area characteristics, and housing tenure can all result in diverse outcomes (Gibson et al., 2011). Despite the improvements in warmth and energy efficiency interventions, which are primary elements of housing-led regeneration, limited changes may emerge in self-reported health (Thomson et al., 2007). Residents have also reported different experiences related to their relocation to different neighbourhoods (Egan et al., 2013).

The conceptualisation of health and well-being can also be complex and should consider mutually constitutive interactions amongst the dynamics of places and communities (Atkinson, 2013; Atkinson et al., 2020). Furthermore, complexities that arise from the domains of sustainability, health, and well-being can result in unintended consequences related to decision-making. For example, energy-efficient approaches to reducing energy use can increase overheating and mortality risks (Jonathon et al., 2018). In addition,

deprivation and systemic inequality problems can reinforce environmental issues, such as air pollution (Ferguson et al., 2021).

The risks of displacement and gentrification in social housing regeneration. Regeneration often involves large-scale demolition and can result in changes in tenure. In relation to social housing regeneration in particular, the risks of displacement and gentrification when residents move as part of a restructuring process have been highlighted in previous research (Mehdipanah et al., 2018). For residents who move to new neighbourhoods, the relocation process can confer improvements in dwelling quality and in the neighbourhood's physical environment; it can also produce an enhanced sense of community and greater trust amongst co-residents (Kearns & Mason, 2015). However, the benefits might depend upon whether the new neighbourhood provides sufficient improvements in neighbourhood-level determinants of health (Egan et al., 2015). And the movements between areas, or the rehousing process, might exert a small negative effect on mental health and well-being (Kearns et al., 2020).

In addition, it has been argued that the benefits of newly built homes, especially when the development focuses on benefits for the middle class, will not 'trickle down' to the lower classes in the housing market, leading to displacement, segregation, social polarisation, and gentrification (Lees, 2008). Furthermore, social mix policies that underlie public housing regeneration can be viewed as a means to harness market capital by attracting higher-income residents to the inner city rather than promoting social inclusion between public housing tenants and private renters (Arthurson et al., 2015). The mixed results in terms of how demolition and relocation impact residents demonstrate the importance of considering individual and contextual factors in regeneration (Egan et al., 2013).

The unclear impact on environmental sustainability. The third challenge concerns urban regeneration's impact on sustainability[2] outcomes and which regeneration options benefit the environment more. The framing of sustainable development in regeneration is related to environmental, ecological, and societal opportunities (Couch & Dennemann, 2000). Thus, central to the sustainable development of places will be the inclusion of broader sustainable features within the development to foster complex connections across multiple domains. Consequently, the use of the term 'sustainability' in urban regeneration, as opposed to 'environmental sustainability', often indicates the long-term availability of

[2] In this thesis, the term "sustainability" primarily refers to environmental sustainability, although it generally encompasses the broader range of SDG goals associated with comprehensive sustainability.

key resources as well as well-being (Atkinson et al., 2020). An inadequate emphasis on sustainability, a lack of knowledge and communications, and limited resources can impair decision-making related to sustainability (Winston, 2010). For example, a survey involving over 100 built environment professionals working in the UK housing sector revealed that sustainability toolkits and models were rarely used in housing regeneration projects; instead, finance-based toolkits continued to dominate decision-making (Higham et al., 2016).

In relation to sustainability in particular, Evans (2012) noted that since regeneration far exceeds a single actor's organisational and economic capabilities, the purposes of sustainable regeneration require the cooperation of various actors, including planners, communities, developers, and architects. Evans (2012) also emphasised how expensive it is to deliver sustainability in rehabilitation projects. Furthermore, the refurbishment option of upgrading the home can be achieved more cheaply than demolition (Power, 2008). The embodied carbon from redevelopment, and the disintegration of building materials from the demolition process can jeopardise the achievement of sustainability goals; thus, refurbishment, in comparison to the option of demolition and new development, can yield more benefits related to environmental sustainability (Power, 2010).

The complexities of a holistic approach. Urban regeneration activities involve a wide range of topics across social, economic, and sustainable domains; these activities have vast variations in their scopes and boundaries, requiring significant funding and financing, which necessitates consistent decision-making related to allocating resources involving multiple stakeholders. The holistic approach involves the inclusion of multiple stakeholders in the decision-making process, including the community, the government, the public, experts, developers, and designers (Wang et al., 2014). Additionally, it has been suggested that a comprehensive view of sustainability in the context of urban regeneration should not only encompass building performance and ecological impact but also consider social outcomes in terms of neighbourhood leisure, retail, educational, medical, cultural, and open-space amenities, as well as economic consequences (Peng et al., 2015). However, the prioritised factors can vary depending on the perspectives applied (see Table 1-1). For example, for policy-makers and planners, housing improvements, as opposed to neighbourhood-level activities, might be more favourable (Egan et al., 2013). For residents, in comparison, social relationships and support, rather

than housing conditions, are perceived as more critical for health and well-being (Crawford et al., 2014).

Tensions and trade-offs between multiple goals. A key aspect of the holistic approach is the exploration of co-benefits or connections and the potential trade-offs between varying objectives. For example, applying energy-efficient measures to existing housing stock can mitigate climate change and cold-related health risks (Conlon et al., 2011). Emerging research has highlighted that in relation to regeneration, organisations face paradoxical demands to protect the local culture and well-being (Slawinski et al., 2019). In the broader built environment research, studies regarding the management of sustainability issues (Van der Byl et al., 2020), green buildings (Hoffman & Henn, 2008), and complex social problems (Hahn et al., 2016) have emphasised the contradictions between economic, social, and sustainability concerns in relation to addressing environmental and social issues. Additionally, decisions regarding healthy urban development must consider short-term versus long-term tensions and constraints regarding financial barriers (Pineo and Moore, 2021).

Overall, regeneration initiatives offer opportunities to support people's health and well-being, but the decision-making process can be challenging because of the complexities and dynamics related to regeneration that imperil the achievement of regeneration outcomes.

1.2.3 Towards systems approaches to decision-making in the context of regeneration

The complex mechanisms of health and sustainability improvement in regeneration projects have been highlighted in relation to urban regeneration (Thomson & Thomas, 2015; Walthery et al., 2015), highlighting a holistic or systems approach in decision-making (Kearns et al., 2021; Macmillan et al., 2016; Sharpe et al., 2018; Zimmerman et al., 2018). The systems approach to decision-making regarding regeneration must consider the interconnections and co-benefits across sustainability and health (Hiscock et al., 2014; Jonathon et al., 2018; Wilkinson et al., 2007). It also must consider decision-makers' needs to respond to different priorities, including conflicting demands between economic and social or sustainable interests, in decision-making (Slawinski et al., 2019; Van der Byl et al., 2020), as well as trade-offs and unintended consequences (Shrubsole et al., 2014).

A systems approach to decision-making emphasises the connections, interactions, and forms of feedback between a system's many parts rather than focusing on individual components (Sterman, 2000). The nonlinear feedback between the myriad parts of the system contributes to the complexities and dynamics observed. As Figure 1–1 illustrates, the decision-making system can be conceptualised as the visible and invisible parts of an iceberg. The visible part of the iceberg represents the decisions and actions, which are the tangible outcomes of the decision-making, such as policies and urban regeneration projects.

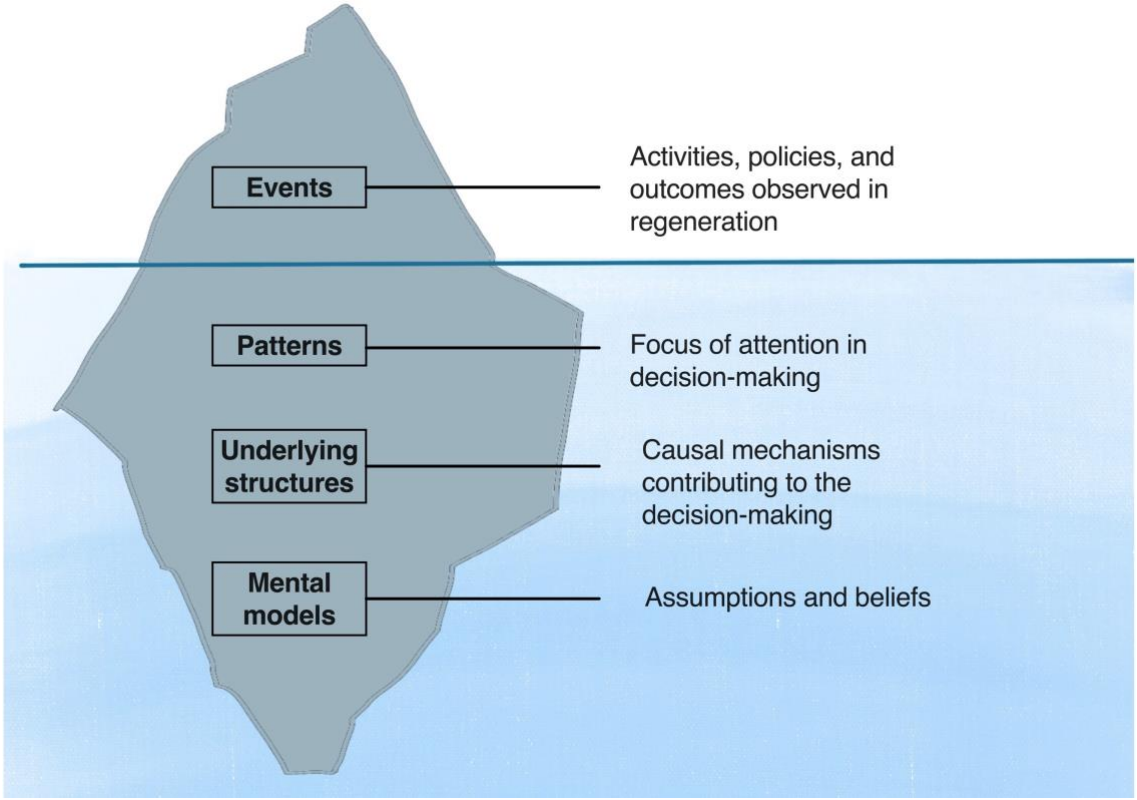

Figure 1–1: Systems approaches to decision-making. Source: Author.

The iceberg submerged below the surface represents the decision-making patterns (focus of attention) and the underlying causal mechanisms that influence decision-making. Specifically, the decision-making theory suggests that decisions involve choosing preferred options from a range of possibilities, which involves focusing attention on selected issues (Ocasio, 1997, 2011; Simon, 1957). The theory of the 'attentional-based view' (ABV) defines attention as ‘noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on issues and answers’ (Ocasio 1997, p. 189).

Furthermore, the mental model incorporates values, goals, and the decision-makers' perceptions of the system; these factors inform the underlying structure and focus of attention (Doyle & Ford, 1998). The decisions and activities involved in regeneration are visible aspects of decision-making, and they are driven by the complexities and dynamics beneath the surface, as illustrated in Figure 1–1. Just as the invisible part beneath the surface supports the visible portion of the iceberg, the events are shaped by the underlying factors that influence the decision-making process. The tensions in place-based decision-making, which is situated underneath the iceberg, can induce tensions in the regeneration outcomes which are visible in the iceberg.

The systems approach to decision-making presumes that the decision-makers devote attention to the broader connections between sustainability and health. For example, retrofit programs apply energy-efficient measures to existing housing stock to address climate change and mitigate cold-related health risks (Conlon et al., 2011). Conversely, decision-making that narrowly focuses on one area rather than considering the systems-level complexities can potentially result in unintended consequences and failures (Davies & Oreszczyn, 2012; Shrubsole et al., 2014).

Place-making in regeneration involves multiple stakeholders and cross-domain information related to places, sustainability, and health and well-being; consequently, the decision-making must consider and balance a broad range of factors that shape the outcomes of the decision (Public Health England, 2021). However, attention, as a cognitive resource to drive decision-making, is limited (Simon, 1957), and what decision-makers do depends on what issues and answers they focus on (Ocasio, 1997). The focus of attention can be heavily influenced by institutional logics, which are composed of norms, values, and beliefs that structure the cognition of actors in organisations (Thornton, 2002).

Given that attention is a limited resource, balancing multiple needs often entails trade-offs. For example, sustainable development goals can produce multiple tensions and conflicting demands, pressuring organisations to balance present and future needs (Van der Byl et al., 2020) or to address divergent but interconnected goals collectively (Bansal, 2005; Soderstrom & Heinze, 2021). While several decision-making tools have been developed to balance these needs, a study of the UK social housing sector found that environmental, economic, and societal aspects of sustainability are not given equal weight in decision-making (Carter & Fortune, 2007). An analysis of five different European

Union countries found that, within the social housing sector, the perceived costs of environmental management are high, and strategic guidance regarding operations and management is lacking (Sunikka & Boon, 2003). It has been noted that grounding the building performance analysis in the economic context can be critical to support the decision-making, although estimating the costs and impacts of urban regeneration can be a complex, uncertain, and subjective process (Crawford et al., 2014).

Rather than focusing on surface-level decision-making events, as illustrated in Figure 1–1, this research focuses on the intangible aspects of decision-making, namely how decision-makers allocate their attention based on various assumptions and beliefs, specifically in relation to sustainability and health. Exploring attentional processes is crucial to account for the wide range of information that decision-makers must attend to in the context of decision-making. In summary, examining the processes and underlying decision-making structures that produce specific outcomes is crucial to achieve the desired socioeconomic and environmental objectives of urban regeneration programmes.

1.3 Research summary

This section summarises gaps in the research, the context of the research, and methods.

1.3.1 Knowledge gaps

Overall, there are several knowledge gaps regarding the systems approach to decision-making in the context of urban regeneration with a focus on sustainability and health. The first knowledge gap concerns the dynamics of managing complex pathways, tensions, and trade-offs in decision-making and the implications regarding sustainability and health. While the existing research concerning urban regeneration focuses on place-based contexts and outcomes (McCartney et al., 2017; Thomson et al., 2006), the decision-making factors involved in the process are seldom explored, thereby limiting our understanding of what specific decisions and strategies are effective to achieve the desired regeneration outcomes.

The second gap concerns how to enhance decision-making that contributes to health and sustainability. The existing decision-making tools stress sustainable development in urban regeneration (Huang et al., 2020; Marta et al., 2017; Peng et al., 2015) but do not sufficiently address the dilemma of balancing multiple goals. Research has uncovered the acute risks of mission drift when organisations fail to balance attention in response to multiple missions (Ebrahim et al., 2014; Ometto et al., 2019), suggesting the need to

understand how to enhance decision-making when multiple goals compete with one another.

Another gap concerns how to develop policies that support organisational decision-making regarding sustainability and health. Regeneration policies strongly impact the focus of regeneration activities and the decision-making (Atkinson & Kintrea, 2002; Kearns, 2003). Given that urban and social systems are complex and can be counterintuitive (Forrester, 1971; Forrester, 1969; Meadows, 2005), resulting in unintended consequences (Davies and Oreszczyn 2012; Shrubsole et al. 2014), researchers have endeavoured to develop systems-thinking-based approaches (Macmillan et al. 2016; Zimmermann et al. 2018; Sharpe et al. 2018). However, the applications of systems methods in exploring the interconnections, trade-offs, and unintended consequences of policy design have been limited. Therefore, understanding how to incorporate systems-based policy design is crucial for designing effective policy interventions.

These critical gaps are worthy of exploration for two reasons. First, tensions and competing demands can be interconnected and produce persistent challenges in place-based decision-making (Smith & Besharov, 2019; Smith & Lewis, 2011). Since urban regeneration, and specifically housing-led regeneration involving demolition, can require significant time, the persistent tensions in decision-making can result in the fragmentation of goals and inconsistencies in achieving the desired socioeconomic and environmental goals. Second, exploring the management of competing demands can offer compelling opportunities to understand how organisations approach immense challenges requiring coordinated responses (George et al., 2016). Major concerns such as climate change, poverty, and inequality sometimes involve complicated, intertwined problems that warrant comprehensive strategies that account for the underlying systems' complexity (George et al., 2016). Major concerns also necessitate striking a balance between economic growth and greenhouse gas reductions between multiple actors (Chenet et al., 2021; Ostrom, 2014). Managing tensions may assist in creating common ground and fostering a consensus between many stakeholders to create long-term, effective, equitable, and sustainable solutions. Additionally, decision-making that promotes health and sustainability can assist in identifying and prioritising exigent concerns as well as resolving divergent objectives and strategies.

1.3.2 Research context

This research specifically considers English HAs' decision-making in housing-led regeneration projects. HAs are charitable non-profit organisations that deliver housing at below-market rents; they are critical stakeholders, especially in the context of social housing regeneration (Arthurson et al., 2015; Egan et al., 2015; Lees, 2008; Mehdipanah et al., 2018).

The HAs in England, as not-for-profit organisations receiving public funds, are essential organisations that provide affordable and quality housing to low-income populations. According to the 2020-2021 English Housing Survey (EHS), HAs tenants comprise 10% of all households in England (2.4 million households), while local authorities manage 7% of all households (1.6 million households) (Department of Levelling Up, Housing and Communities (DLUHC), 2022a). The survey also indicates that social rented homes, in comparison to private-sector homes, are more energy efficient and that most social renters are satisfied with their accommodations.

However, social housing organisations that continue to operate on a non-profit basis to provide homes for disadvantaged groups are most severely affected by the dissonance between financial competence and the achievement of various discordant aims (Card & Mudd, 2006; Redmond & Russell, 2008). Studies have recurringly emphasised HAs' tensions regarding the fulfilment of commercial and social goals, suggesting that changes in policies and funding continue to compromise the delivery of policy goals, prompting a shift in HAs from a traditional social-oriented pathway to a hybrid social-and-market operation trajectory (Mullins, 2000).

Researchers have conceptualised HAs as hybrid organisations that face complex logics, as HAs are highly regulated while being expected to generate income to subsidise a range of housing and social activities, including urban regeneration (Morrison, 2016; Sacranie, 2012). It has been demonstrated that competing needs related to social and commercial goals—a process referred to as 'hybridity'—has provoked HAs to follow divergent paths in developing financing, housing products, and strategies (Blessing, 2012; Jacobs & Manzi, 2020; Morrison, 2016; Mullins, 2012; Sacranie, 2012). Despite HAs' commitment to delivering social goals (Manzi & Morrison, 2018) and improving tenants' employability (Tang et al., 2017), research has proven that the coexistence of social and commercial goals can create dissonance and can have a range of unintended consequences

(Morrison, 2013). The dominance of market logic may result in failures in responding to the needs of households, especially those that are vulnerable to the housing crisis (Manzi and Morrison, 2018).

1.3.3 Research questions

In relation to HAs' social housing regeneration projects, this research asks the following questions:

1) What are the dynamics of decision-making regarding urban regeneration across project stages?
2) How does HAs' decision-making in the context of regeneration projects relate to sustainability and health goals?
3) How do HAs allocate their attention in the context of urban regeneration?
4) How can decision-makers' attention to sustainability and health be sustained?
5) How do external policies influence HAs' decision-making?

1.3.4 Research methods

By constructing a theoretical lens that incorporates bounded rationality (Simon, 1957), attention-based perspectives (Ocasio, 1997), and institutional logics (Greenwood et al., 2011). In this context, the emphasis on "attention" is predominantly rooted in pragmatic considerations concerning its significance within regeneration contexts. While enhancing housing accessibility can positively impact health outcomes, the intricacies of urban regeneration programs pose challenges and offer prospects for advancing both health and sustainability benefits. This necessitates decision-makers to direct their attention towards broader regeneration endeavours beyond solely housing developments. Furthermore, the selection of a theoretical framework harmonizes with the research methods employed and facilitates a more targeted investigation of the chosen subject. This alignment will be elaborated upon in Chapter 4.

This research aims to understand (1) the changes in attention patterns when there are competing demands from economic and social or sustainability interests and (2) the underlying causal feedback mechanisms that contribute to the dynamics of attention patterns and their connections with implications regarding sustainability and well-being.

To apply systems approaches to place-based decision-making, SD tools are primarily used in this research. SD views the system as a set of interconnected parts and employs

methods of mapping, modelling, and analysing the behaviour of a complex system (Sterman, 2000). The foundation of SD is the feedback loops that interconnect the structure and rules (Morecroft, 1985), rendering it suitable for exploring the complexities of the research questions. SD uses CLDs to represent the interconnections between the different parts of the system. It also uses mathematical and graphical modelling techniques to describe a system's structure and behaviour, allowing researchers to simulate the system over time to understand how it responds to various inputs and conditions.

There are two major components of data collection. For the first part of the data collection, a case study of an English HA's urban regeneration projects was conducted. Thirteen interviews and 27 meeting observations were conducted within the case study of the HA. The case study data focuses on understanding the dynamics in decision-making within HAs and on how decision-makers allocate their attention. The second part of the data collection process involved a series of GMB workshops conducted with two HAs that specifically focused on the impact of policies on decision-making in relation to regeneration.

For data analysis, systems thinking tools include CLDs, simulation models, and GMB analysis (Sterman, 2006). Focusing on a systems thinking approach in data analysis can contribute to understanding organisational decision-making in relation to competing demands in two ways. First, it allows for the exploration of the broader system's implications in relation to decision-making. Second, it allows for the generation of system-related insights (Wolstenholme, 2003) by mapping the mechanisms that underlie decision-making. For the first part of the data collection process, CLDs were used to map the causal processes, and a simulation model analysing the generic decision-making challenge was developed. For the second part of the data collection process, a CLD exploring the impact of policies was developed at the workshop. The policy interventions to improve health and sustainability outcomes were identified using a proposed systems-based policy design model. Table 1-2 summarises the links between the RQs, research gaps, aims, data collection, and analysis.

Table 1-2: Summary of research questions (RQ), objectives, and methods

Research gaps	The complexities of decision-making and its implications in the system of place-making	Approaches to enhancing and sustaining decision-making for sustainability and health in relation to regeneration		Policy design approaches to policies that support organisational decision-making for sustainability and health in regeneration
Research questions	What are the dynamics of decision-making in urban regeneration across project stages? (RQ1)	How do HA decision-makers allocate their attention within urban regeneration? (RQ3)	How can decision-makers' attention to sustainability and health be sustained? (RQ4)	How do external policies influence HAs' decision-making? (RQ5)
	How does HAs' decision-making relate to sustainability and health goals? (RQ2)			
Research objectives	• Develop a CLD capturing the interconnections between factors that influence decision-making. • Identify connections between decisions and influences on outcomes	• Identify the change-over-time patterns regarding attention focus on regeneration meetings. • Explain the change-over-time patterns through the dynamics identified	• Develop a simulation model exploring the tensions and challenges in decision-making. • Identify potential intervention points to increase the sustained attention-over-time	• Develop a CLD highlighting the influence of policies. • Identify connections between decisions and impacts on outcomes. • Identify systems-based policy design points
Data analysis	Qualitative analysis	Change-over-time analysis	Simulation modelling from synthesised information	CLD analysis
Data collection	First part: 13 Interviews and 27 meeting observations in an English HA			Second part: GMB workshops with two HAs
Theories	Bounded rationality (Simon, 1957) and attention-based perspectives (Ocasio, 1997)			
Primary tools	Systems analysis (Meadows, 2008; Sterman, 2000)			

1.4 Novel contributions

This research presents three systems models as three strands of output: Firstly, it introduces a qualitative CLD to investigate interconnections between place-making and decision-making in regeneration projects, exploring the broader dynamics involved in decision-making and the impacts on sustainability and health. This broader-level analysis answers RQ1, RQ2, RQ3, and RQ5. Subsequently, on a micro-cognition level, it proposes an SD simulation model focusing on how to sustain decision-making regarding health and sustainability when there are competing demands. The simulation analysis allows an investigation of the competing tensions identified in the first strand of work. This microlevel analysis answers RQ3 and RQ4. Finally, on a policy level, it presents a CLD that examines how policies that are exogenous factors can impact decision-making in the context of urban regeneration, and how systems thinking workshops can potentially be used as a tool to develop policies that support decision-making for sustainability and health. The policy level analysis answers RQ2 and RQ5.

This study makes several major contributions:

1. This study maps the complexities of decision-making, urban regeneration outcomes, and their interconnections in systems maps. The study contributes to systems-based decision-making in urban regeneration, particularly highlighting the tensions and potential trade-offs in urban environmental decision-making, and the risks of decision-making that the urban regeneration initiatives fail to achieve intended goals (*as described in CHAPTER 2* and *CHAPTER 5*).

2. This study presents the first simulation model addressing tensions in group's attention allocation when multiple institutional logics compete. The model contributes to understanding structural tensions of attention allocation in decision-making, and providing approaches to mitigate the consequences of persistent tensions, which can be applied to understand the decision-making in grand challenges that involve social outcomes and financial efficiency in decision-making (*as described in CHAPTER 6* and *CHAPTER 7*).

3. The research contributes to the systems-based policy design approaches by highlighting the dynamics of organisational decision-making and the use of workshops in supporting decision-making (*as described in CHAPTER 2* and *CHAPTER 8*).

4. By exploring different levels of decision-making at the organisation, the policy level, and the micro-cognitive level of attention allocation, the study advances the systems thinking field regarding the exploration of multi-level complexity within qualitative data (*as described in CHAPTER 9*).
5. Regarding the methods, the study first uses a qualitative analysis to indicate changes in attention patterns, providing a new approach to measure and evaluate attentional patterns in decision-making. The integration of connects the structural complexities and behaviour complexities that illuminate each other (*as described in CHAPTER 4*).

The thesis is organised as follows:

- CHAPTER 2 presents a pathway diagram linking decision-making and regeneration impacts based on the literature review of relevant studies concerning urban regeneration, including both housing-led and area-based initiatives. The pathway provides a preliminary understanding of the complexities of decision-making in relation to urban regeneration.
- CHAPTER 3 summarises the urban regeneration agenda in England and discusses research regarding English HAs, providing a governance and organisational context for this research.
- CHAPTER 4 summarises the methodology. It introduces the theoretical perspectives used, provides an overview of the data collection and analysis for the HA case study, and presents the GMB workshop. It summarises the basis of the theory used and delineates the steps in the data analysis.
- CHAPTER 5 presents the first portion of the empirical findings (empirical model 1). It presents the CLD connecting urban regeneration outcomes with decision-making, the main themes of decision-making in urban regeneration, and the change-over-time patterns regarding attention allocation in regeneration meetings. The qualitative findings have informed the development of subsequent chapters.
- CHAPTER 6 summarises the theories regarding managing tensions within decision-making. Theoretical models were identified from existing theories and presented using CLDs, providing a theoretical basis for the subsequent modelling chapter. Specifically, this chapter presents rationales regarding why attention-

based perspectives and institutional logics are pivotal to understanding HAs' decision-making in the context of urban regeneration, providing theory basis for the subsequent theory modelling chapter.

- CHAPTER 7 reports the second portion of the findings (empirical model 2). It presents a simulation model that focuses on reconciling competing tensions in decision-making. The model is developed upon qualitative analysis and existing management theories. Strategies to sustain attention to social missions (health, well-being, and sustainability) are presented.
- CHAPTER 8 presents the third portion of the findings (empirical model 3). It summarises the results of the GMB workshop and proposes a systems approach to policy design. It discusses the consequences and impacts of urban policy changes on the HA's decision-making regarding regeneration.
- Finally, CHAPTER 9 summarises the insights gleaned from the three models (presented separately in CHAPTER 5, CHAPTER 7, and CHAPTER 8). This final chapter delineates the synthesised insights and provides a discussion of the main contributions.

Figure 1–2 illustrates the flow of the thesis structure.

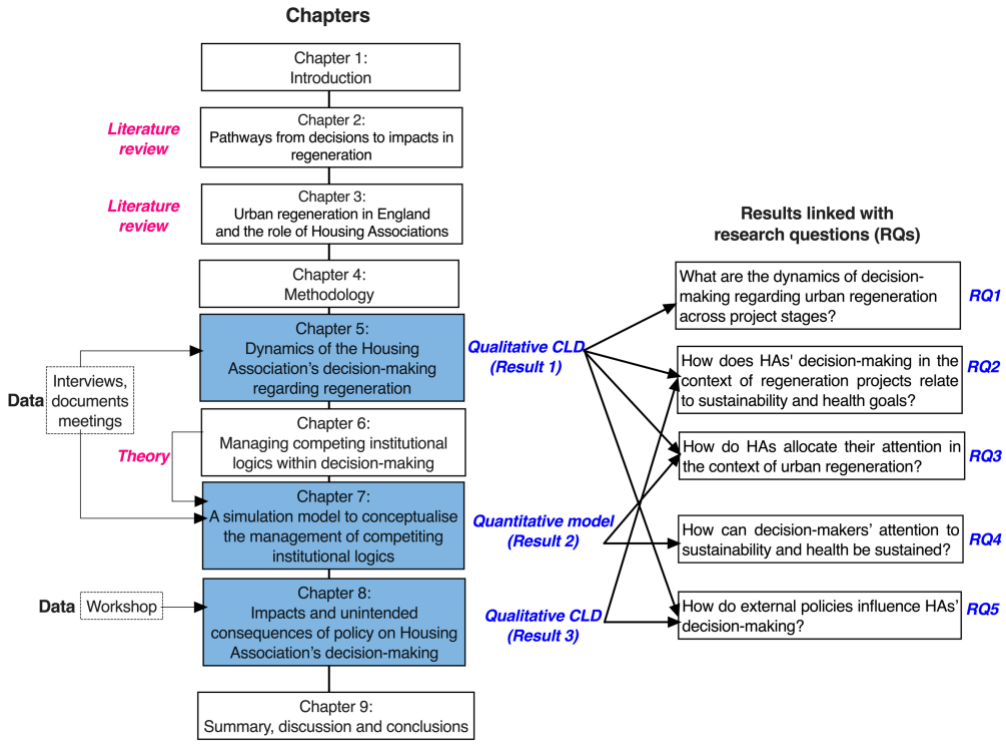

Figure 1–2: Chapter structure, with results chapters highlighted in blue.

CHAPTER 2

Pathways from decisions to impacts in regeneration

2.1 Introduction

Regeneration is based on the theoretical premise that better housing conditions result in better health and sustainability results. Researchers have increasingly focused on the causal mechanisms or trajectories of health improvement in regeneration projects (Thomson & Thomas, 2015; Walthery et al., 2015). Decision-making regarding urban health improvement involves a high level of complexities regarding the built environment (Eker et al., 2018; Rydin et al., 2012). Researchers have highlighted an integrated or holistic means of linking housing, energy, and well-being (Kearns et al., 2021; Macmillan et al., 2016). However, the evidence regarding health benefits in relation to urban regeneration is mixed (Thomson & Thomas, 2015). Additionally, the impact of different regeneration options on sustainability has been debated (Crawford et al., 2014; Power, 2008). Furthermore, most research has primarily examined housing and urban renewal results, thereby limiting our knowledge of the precise choices required to enhance regeneration outcomes (Curl & Kearns, 2015).

This chapter seeks to synthesise decision-making evidence and the trajectories leading to the results of urban regeneration. First, the definitions of health, well-being, and sustainability in the context of urban regeneration are explored. A summary of decision-making support tools and challenges related to urban regeneration is then provided. Subsequently, a pathway map is created exploring the connections between decision-making and regeneration results. The review included both housing-led and area-based initiatives. This chapter concludes with discussions of decision-making in urban regeneration and the next steps in this research.

2.2 Defining healthy and sustainable housing

This section summarises the definitions of health, well-being, and sustainability in housing and building research in relation to regeneration contexts and elucidates the different conceptualisations of sustainability.

2.2.1 Health and wellbeing

Firstly, health in the context of improved housing refers to decreases in injuries, non-communicable illnesses, and infectious diseases in populations due to improvements in housing, such as in thermal and energy efficiency conditions. Specifically, conditions such as cold weather and mould are deleterious for respiratory health (Osman et al. 2008). Long-term cold exposure can intensify cardiovascular risks (Analitis et al., 2008). The combination of thermal insulation and heat supply in buildings can reduce the risks of cold-related respiratory and cardiovascular conditions (WHO 2018). Energy-efficient buildings can also mitigate health risks (Wilkinson et al., 2007). Weatherisation programs that retrofit the existing housing stock with energy-efficient measures can decrease cold-related health risks (Conlon et al., 2011).

Secondly, the literature regarding healthy housing discusses psychological well-being and mental health issues. For instance, poverty and low home quality are linked to conditions such as depression and anxiety and to the externalisation (e.g., aggression) of psychological problems (Rollings et al., 2017). A survey of 536 UK social housing residents found that householders expressed a sense of helplessness and frustration; they struggled to keep warm and reported a cluster of condensation, dampness, and mould issues (Boomsma et al., 2017). Another long-term study utilising data from the British Household Panel Survey from 1996 to 2008 indicated that even one year of living in inadequate housing could significantly impact one's mental health (Pevalin et al., 2008, 2017). In this manner, changes in home conditions such as heating, lighting, condensation, leaky roofs, damp walls, or wall rot might improve occupants' health and well-being (Pevalin et al., 2008). Additionally, physical health and well-being interact. For example, physical health and a sense of control over one's house were demonstrated to moderate the relationship between moisture and mould in housing conditions and depressive symptoms (Shenassa et al., 2007).

Thirdly, well-being in relation to housing and buildings is a comparatively new concept and is often used in conjunction with the word ‘health’. According to Hanc et al. (2018), the concept of ‘well-being’ encompasses a socioeconomic viewpoint (individuals' cognitive perception, performance, and productivity, learning, and personal progress) as well as a social perspective (individuals' engagement and contact with others). From this perspective, individuals' self-reported happiness, life satisfaction, sense of purpose, etc. in the social context is critical for increasing well-being (John & Robert, 2004). In the

UK's Measuring National Wellbeing programme, well-being intersects with relationships, general health, environmental perceptions, and personal growth and finance.

Aside from housing conditions, in their guidelines regarding healthy housing, the WHO (2018) stated that health and well-being depend upon the local community and the broader immediate housing environment, such as access to greenspace to support social interactions and well-being. For example, aesthetics and amenities in neighbourhood environments change perceptions of the environment (D'Haese et al., 2015) and physical activity (Alexia et al., 2017; Rollings et al., 2017; Sawyer et al., 2017, 2018). Additionally, research regarding well-being emphasises the need for community participation and capacity building. Poor neighbourhoods, for instance, exert a detrimental impact on mental health (Fone et al., 2014). Offering community-based initiatives, crime-reduction measures, career training, or business help in underprivileged areas might enhance inhabitants' mental health and well-being (White et al., 2017). In relation to regeneration, the neighbourhood environment also strongly impacts health and well-being (Crawford et al., 2014).

2.2.2 Environmental sustainability

Urban sustainability encompasses the sustainability of multiple 'systems' of natural, agricultural, and urban and water resources (Hiremath et al., 2013). A critical component of environmental sustainability is building performance. For instance, the green building rating systems evaluate the environmental performance of buildings based on their energy efficiency, water efficiency, materials selection, and other sustainable design features (Reeder, 2010). Typical rating systems include Leadership in Energy and Environmental Design (LEED) in the US and the Building Research Establishment Environmental Assessment Method (BREEAM) in the UK.

Green construction minimises the environmental effect of the materials used throughout their lifespan by using less energy and water (Yudelson, 2009). As sustainable buildings may reduce pollutant emissions and improve the health and productivity of their occupants (Wilkinson et al., 2007, 2009), improving building performance is regarded as a 'public health tool' to improve human health (Cedeño-Laurent et al., 2018). Evidence suggests that improvements in energy efficiency fail to decrease energy consumption levels due to occupants' ingrained habits related to energy use (Elsharkawy & Rutherford, 2018). On the other hand, research has also uncovered unintended consequences of improving energy efficiency if the improvements only focus on the energy performance

and overlook the system's complexities (Davies & Oreszczyn, 2012; Shrubsole et al., 2014).

Regeneration and sustainable development are closely intertwined, as both pursue holistic approaches to economic and social improvements in the surrounding areas (Evans, 2012). Since the 1990s, regeneration programmes have increasingly connected economic and ecological aspects with the local social and cultural vitality through a 'sustainability-oriented' approach (Colantonio & Dixon, 2011). Specifically, indicators of environmental sustainability in relation to regeneration are broader, including building performance (energy efficiency of building layout, materials, construction, reclamation of building materials, residential density) and ecological development (parentage household waste recycled, waste minimalisation, noise emission, and green space [Peng et al., 2015]). The extent to which sustainability is limited to building performance or ecological dimensions depends on the specific sustainability frame. As Dixon (2006) has summarised, there are two types of frameworks of sustainability. One is the 'Three Pillars' of sustainable development [3], which suggests merging economic, social, and environmental goals. The other one is called the 'Russian Doll' model, in which financial goals are situated at the centre of sustainable development but are constrained by environmental and social resources. While the first sustainability model focuses on balancing diverse needs, expectations, and representations of sustainability aspects, the latter model focuses on the limitations and constraints of growth .

2.3 Decision-making support tools and challenges regarding urban regeneration

A growing body of literature has examined how to facilitate and navigate decision-making in the context of urban regeneration. This section summarises the decision-making tools related to regeneration.

2.3.1 Decision-making support tools in regeneration

Regarding environmental sustainability, the indicator or model-based approach has been widely used to support decision-making. For example, Peng et al. (2015) used fuzzy set theory and a Monte Carlo simulation to reveal critical indicators in measuring building performance and environmental and economic development. Wang et al. (2014) used the

[3] While various sustainability frameworks exist, the thesis employs a grounded theory coding approach to analyse sustainability within the case studies. This chapter serves as an introduction to essential concepts, and the methods chapter provides a rationale for the selected theoretical frameworks, setting the foundation for the empirical chapters that follow.

framework to support site planning in decision-making, especially at the early stage of the planning process, linking the indicators to the data sources.

Under the broader framing of sustainable urban regeneration, Hemphill et al. (2004) combined a 'top-down' (preliminary analysis to yield a typology of factors) and 'bottom-up' (listing the elements from the grassroots level) approach. It developed five indicators regarding broader sustainable urban regeneration: economy and work, resource use, buildings and land use, transport and mobility, and community benefits. In the decision-making matrix for urban renewal at the neighbourhood level developed by Huang et al. (2020), sustainability is measured based on social, economic, and environmental factors and land use, and the physical condition of a neighbourhood depends on the building and facility conditions in the area. The physical condition of the communities and sustainability appear to be the core criteria for decision-making in selecting regeneration strategies (Huang et al., 2020). Specifically, six paths of urban renewal are suggested, including a different focus on regeneration:

- Internal refurbishment: Internally refurbish to increase the physical conditions of buildings
- Revitalisation: Enhance the local characteristics
- Partial rebuilding: Rebuild the buildings and infrastructure in some old areas
- Rehabilitation: Decelerate urban decay by rehabilitating existing structures
- Redevelopment: Comprehensive redevelopment of the built environment and infrastructure
- Conservation: Apply measures to retain superb conditions

2.3.2 The complexities of decision-making related to urban regeneration

In general, decision support tools mainly focus on indicators for measuring or assessing sustainability (Huang et al., 2020), the economic costs of different regeneration options (Apollo & Miszewska-Urbańska, 2015), the criteria for social sustainability (Marta & Giulia, 2020), and spatial decision support systems (Riera Pérez et al., 2018).

The diverse paths and indicators in decision support tools demonstrate the broad range of regeneration activities and outcomes, but decision-making in the context of regeneration entails further complexities. Sustainability definitions must consider the urban context and social networks of actors (Alexandrescu et al., 2018). Existing research regarding the

decision-making process in urban regeneration has focused on the complex interactions between multiple stakeholders and how to achieve collaborations (Wang et al., 2021). Additionally, each stakeholder's utility needs and priorities can vary (Manganelli et al., 2020).

Community engagement is particularly important for regeneration projects (Pineo, 2017). In particular, the emphasis on ‘people’ and ‘places’ has encouraged an overall shift towards local empowerment and collaboration with community leaders to understand the local problems (Hemphill et al., 2006). Engagement with residents in urban design is regarded as involving community actors in the decision-making (Jiang et al., 2020). However, Hall and Hickman (2011) identified several obstacles in community participation: a lack of an operational definition of community participation by the government and local authority, the centralised character of governance, and fragmented engagement through cooperative associations. Nisha and Nelson (2012) pointed to participatory urban design to inform design decisions. From the community engagement perspective, designers are not only technical experts or decision-makers but also can play an active role in the community regeneration (Jiang et al., 2020).

Institutional, social, and economic arrangements that influence urban development are critical to forming collaborations related to sustainable development (Boyle et al., 2018). For example, ‘institutional capacity’ encompasses a stable subsidy regime, development agencies with a long-term remit rather than a short-term political cycle, the expertise and capacity to develop knowledge and opportunities, and strategic framework and community-based initiatives (Healey, 1995). The appraisal of area performance must account for both ‘market’ aspects (income, investment totals, and associated leverage ratios) and ‘nonmarket’ elements (the preference or willingness to accept business improvement districts within regeneration projects; Hemphill et al., 2014). For example, particularly for sustainable development, the government needs incentives to encourage developers to pursue green building developments (Olubunmi et al., 2016).

2.4 Mapping decision–impact pathways in relation to regeneration

In summary, sustainable and healthy regeneration is a complex concept, and the connections between regeneration outcomes and decision-making are ambiguous. To understand what decisions can improve health, well-being, and sustainability outcomes in relation to urban regeneration, selected regeneration projects have been reviewed to

produce a map of interconnected decisions and regeneration outcomes. This section describes the review process.

2.4.1 Identifying urban regeneration programmes and studies

Six regeneration programmes were included in the pathway: New Deal for Communities (NDC), Glasgow Opportunities for Wellbeing, Wealth, and Work (GoWell), the Scottish Housing, Health, and Regeneration Project (SHARP), Neighbourhoods Law, the Dutch District Approach (DDA), and Neighbourhood Renewal (NR). The programmes were identified by reviewing studies that report regeneration projects' impacts on health and well-being.

There are several reasons for the selection of these projects. Firstly, the selected regeneration projects encompass an assortment of relevant studies that use a range of methods and criteria to ensure the quality and comprehensiveness of the findings. For example, the inclusion of control groups in the NDC programmes (Cotterill et al., 2008; Stafford et al., 2008, 2014) can help to assess the effectiveness of regeneration compared to the reference or benchmark scenario, increasing the generalisability of the findings. The use of longitudinal cohort datasets in the GoWell studies (Curl et al., 2015; Egan et al., 2013, 2016) and pre- and post-intervention data in the DDA studies (Jongeneel-Grimen et al., 2016; Kramer et al., 2014) has allowed the evaluation of long-term impacts. Additionally, the triangulation of interviews and comparison data from NR and SHARP studies (Kelaher et al., 2010; Petticrew et al., 2009) has generated rich results assessing the outcomes.

Secondly, the studies reported statistical correlations, which indicate how a change in one variable is related to another variable. While correlation is not necessarily a causal mechanism, the strength (such as the correlation coefficient) and consistency (if the relationship can be found in multiple contexts) of the effect across different contexts can reveal a plausible mechanism by which the cause could produce the result.

Thirdly, the studies were identified as rigorous in previous regeneration systematic studies, which screened and assessed the quality of the studies. Specifically, all of them were included in the systematic review (McCartney et al., 2017), which was one of the most recently updated systematic reviews regarding the impacts of regeneration on health. Four selected regeneration schemes were included in the other most recent systematic reviews (Moore et al., 2018). Although the projects do not represent all regeneration

projects, the rich studies provide opportunities to understand what decisions can facilitate improved regeneration outcomes, bolstering the literature review's aim. The comparisons between studies facilitate the assessment of the consistency of the results.

2.4.2 General characteristics of the selected projects and studies

The projects include area-based initiatives and housing-led regeneration programmes, as well as approaches to urban regeneration to improve the social and economic conditions of disadvantaged or deprived urban areas. Areas-based regeneration is a broader approach that seeks to improve a particular area's social, economic, and physical conditions. For example, NDC was an area-based regeneration programme that was executed in the UK in 1998 to address social and economic regeneration in deprived urban areas funded by the Department for Communities and Local Government (DCLG). NDC targeted 39 of the most deprived areas in England and aimed to reduce the gap between these communities and other areas of the country in relation to several issues: crime, community, the environment and housing, and education. The comparisons between studies facilitate assessments of the consistency of the results. While housing demolition and improvements targeting poor-quality housing have been implemented, NDC also launched various projects and initiatives to improve the quality of life.

Similarly, the urban renewal project in Catalonia focused on area-based improvements in various realms, including traffic and transportation, social and employment, parks, community centres and public spaces, and energy efficiency. For DDA, the 40 most deprived districts' broader issues, such as employment, educational level, housing conditions or residential environment, safety, and social cohesion, were included. NR is a programme in Victoria, Australia that involved the participation and engagement of neighbourhood residents and stakeholders; it focuses on the social, economic, and physical circumstances of underprivileged neighbourhoods.

Housing-led regeneration, on the other hand, seeks to focus on the quality and availability of housing to address social and economic challenges. Depending on the specific homes and neighbourhoods, housing-led renewal can vary in terms of cost and composition. For example, for the GoWell programme in Glasgow, Scotland, the investment programme focused on a large housing stock in the social rented sector, which had been considered to be in poor condition. It was transferred from the council to the Glasgow HA in 2003. The targeted housing regeneration in GoWell entailed improvements in a central heating system, kitchens, and bathrooms. Also in Scotland, the SHARP is a housing-led

regeneration project that aims to improve the quality and conditions of housing and to address issues of fuel poverty and energy efficiency. The programme was funded by the Scottish Government and involved a range of initiatives and interventions to support the regeneration of communities in Scotland. Specifically, SHARP focuses on the effects of social-renting residents moving into newly built homes with improved housing conditions, such as warmth, the eradication of dampness, and more space. Table 2-1 describes the general characteristics of selected regeneration programmes and lists pertinent papers.

Table 2-1: Information about selected regeneration studies

Regeneration programmes	Location	Time	Description	Papers included
New Deal for Communities	England, UK	1998-2011	The programme included the regeneration of 39 deprived areas in England. Each area received 50 million pounds over ten years, totalling 2 billion pounds.	(Cotterill et al., 2008; Stafford et al., 2008, 2014; Walthery et al., 2015)
Glasgow Opportunities for Wellbeing, Wealth, and Work	Scotland, UK	2003-2016	The programme involved housing-led regeneration focusing on improving the quality and availability of housing. Between 2003 and 2015, about 45,000 homes were included.	(Curl et al., 2015; Curl & Kearns, 2015; Egan et al., 2013, 2016)
Scottish Housing, Health, and Regeneration Project	Scotland, UK	2002-2008	The programme involved a quasi-experimental investigation of the health effects of urban regeneration and new social housing.	(Kearns et al., 2011; Petticrew et al., 2009)
Neighbourhoods Law in Catalonia (Llei de Barris)	Catalonia, Spain	2004-2011	The programme was one of Europe's largest urban renewal projects and targeted deprived neighbourhoods.	(Mehdipanah et al., 2013, 2014)
Dutch District Approach	Netherlands	2007-2012	The area-based initiative targeted urban regeneration in the 40 most deprived	(Jongeneel-Grimen et al., 2016; Kramer et al., 2014)

			districts of the Netherlands.	
Neighbourhood Renewal	Victoria, Australia	2001	The scheme included 21 project sites across Victoria.	(Kelaher et al., 2010; Shield et al., 2011)

The inclusion of both housing-led and area-based regeneration is crucial since they address various facets of the regeneration process. Improvements to the built environment and housing quality, which can directly benefit locals and enhance their quality of life, are the main goals of housing-led revitalisation. However, the lack of employment opportunities, social isolation, and crime are some of the more fundamental problems that may not be addressed or reported within this approach. Area-based projects, on the other hand, concentrate on solving these more general problems, frequently by involving the local community and enhancing the facilities and services that are already available. Therefore, a comprehensive review that combines both housing-led and area-based initiatives can help to develop a more cohesive understanding of the decisions necessary for improved regeneration outcomes.

The programmes evaluated health outcomes using various measures. The three basic categories of health that have been measured include self-rated, mental, and physical health. The Mental Health Inventory-5 (MHI-5), the Short Form Health Survey version 2 (SF-12v2), the 12-item General Health Questionnaire (GHQ-12), and self-rated health are commonly used as health indicators. Each questionnaire includes various sub-scales and questions for evaluating health conditions. For example, self-rated health is typically captured by a five-point scale that assesses health ratings. MHI-5 is a five-item instrument that asks participants to assess their mental health symptoms on a five-point scale. The programmes also addressed smoking, recreational physical activity, and respiratory and circulatory problems.

Environmental quality evaluations vary depending on the focus at the environmental level or specific housing problems. For example, satisfaction with the local area (Stafford et al., 2008) captures the overall perception of the community and the neighbourhood. Additionally, specific housing problems, such as dampness, insufficient privacy, and noise, can be used to evaluate the housing conditions (Petticrew et al., 2009). The included studies also capture the investment level and strength of the regeneration interventions. Investment is represented by the mean investment per household over the last five years (Egan et al., 2016). The strength of the interventions is evaluated based on

the intensity of environmental scores synthesising a range of policy areas, such as housing conditions, safety and community cohesion, education and employment, green and public spaces etc. (Jongeneel-Grimen et al., 2016; Kramer et al. 2014).

2.4.3 The steps involved in eliciting decision–impact pathways

The pathways from decision-making to regeneration results were extracted using keywords from the research. The keywords were then examined and combined into several decisions in the graphic. The appendix A1.1 Key pathways identified in the literature review includes details regarding key connections and sources of evidence.

2.5 A decision–impact pathway diagram in regeneration

In summary, four decision-making areas, namely housing design, neighbourhood design, socioeconomic services, and investment, impacted the regeneration results. The physical aspects of a home, such as the bathroom, kitchen, fabric, and rooftop work, are considered while making house design selections. Neighbourhood design accounts for the physical features of the neighbourhood, such as location, accessibility to transportation, and public spaces. Investment in regeneration also considers the amount of spending and the scope of the operations. The decision-making process for socioeconomic interventions reflects various programmes and actions to enhance the socioeconomic characteristics of the region, including community involvement, education, and qualifying services.

Figure 2–1 presents the causal pathways between decisions and regeneration outcomes. This part summarises the crucial decision-making categories connected to successful regeneration. Pathways are mapped with solid lines and study numbers that support the relationship. Dotted lines are used to indicate pathways that have inconsistent results.

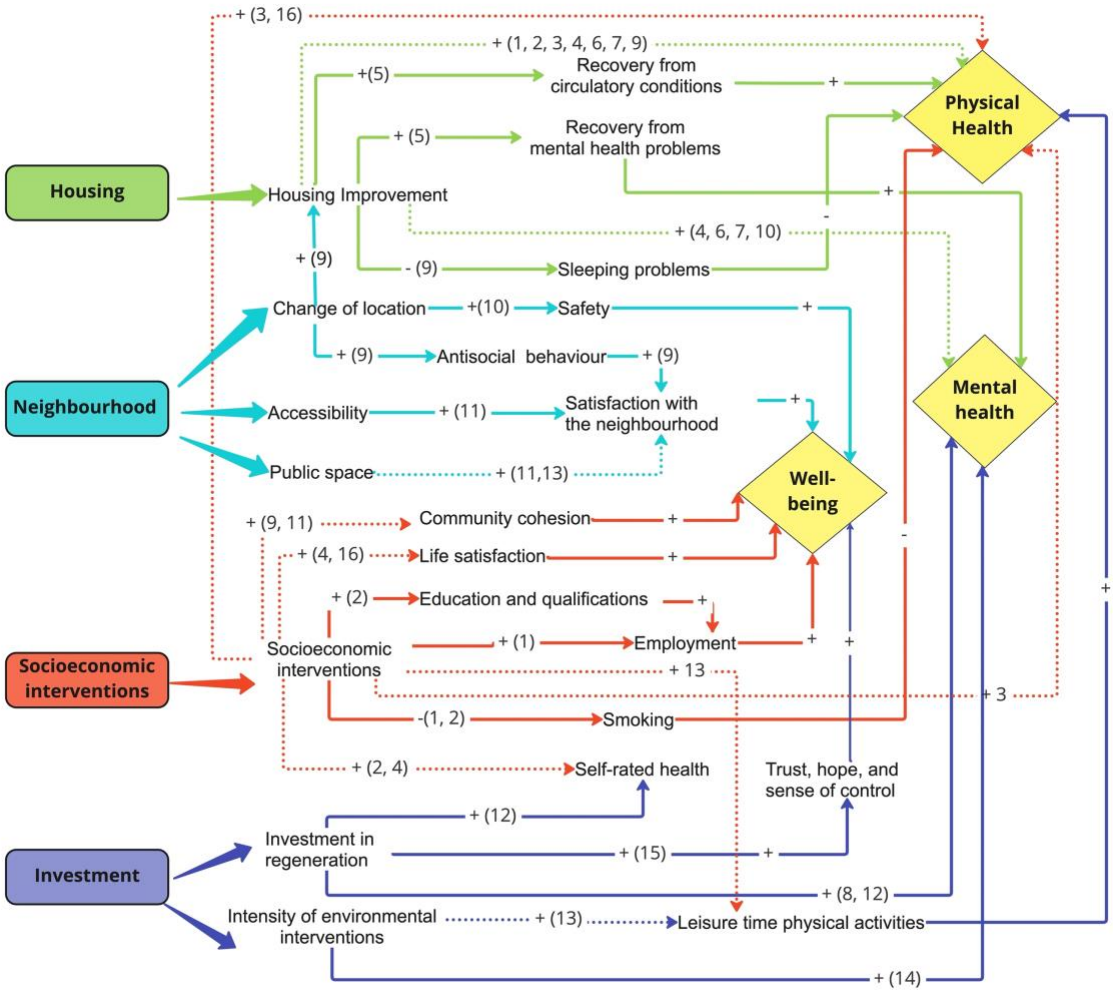

Figure 2–1: The decision–impact pathway in urban regeneration. Left box: decision aspects. Diamond box at the right side: regeneration outcomes. Studies that support the links are marked with the corresponding ID number, which is included in A1.1. The dotted line represents inconsistent results.

2.5.1 Housing

Housing design elements have exhibited the potential to improve physical health. The GoWell projects in Glasgow focused on housing improvements, including changes in central heating, doors, fabric works, and kitchens and bathrooms. Although the warmth interventions, mainly involving external fabric works (including a range of improvements in insulation, cladding, roof renewal, and balcony repairs) and central heating, cannot prevent the onset of health problems, they can exert curative effects that help patients recover from circulatory conditions and mental health issues (Curl et al., 2015; Curl & Kearns, 2015), thereby contributing to improvements in physical health and mental health.

However, the overall impact of housing improvements on physical health is unclear. For example, central heating can also negatively affect physical health, while fabric work can benefit physical health (Curl et al., 2015). Additionally, housing improvements significantly reduce the prevalence of sleeping problems (Petticrew et al., 2009). Other studies suggest that there are no significant changes in health scores (Egan et al., 2013). Similarly, NDC did not yield evidence of how regeneration activities erode or improve people's self-reported health (Walthery et al., 2015). In SHARP, although housing improvements can be significant, no association has been identified between the number of housing problems and health outcomes (Petticrew et al., 2009). Research also suggests that there might be initial improvements in health outcomes (Stafford et al., 2008) that become insignificant within long-term evaluations compared to similar deprivation-level sites (Stafford et al., 2014), although the likelihood of quitting smoking increased in the regeneration (Stafford et al., 2008, 2014).

The evidence regarding housing improvements and mental health remains mixed. Specifically, new kitchens and bathrooms exhibited positive associations with mental health one year after the intervention in GoWell (Curl et al., 2015). Additionally, the GoWell programme demonstrated that housing improvements could result in small improvements in mental health over time (Curl et al., 2015; Egan et al., 2013). In comparison, the NDC regeneration found no significant changes in mental health, self-reported health, and life satisfaction after the regeneration (Walthery et al., 2015).

Socioeconomic characteristics can influence individual experiences, indicating a demand to engage and explore different groups' and household types' needs. For example, renters experience a more remarkable improvement in their mental health (Walthery et al., 2015). Additionally, compared to men, women can experience more significant mental health improvements (Jongeneel-Grimen et al., 2016).

2.5.2 Neighbourhood

Regeneration can change neighbourhood conditions. The accessibility of the neighbourhood via car and public spaces remain important factors in determining residents' satisfaction with the neighbourhood (Mehdipanah et al., 2013). The availability of green spaces and other environmental interventions can increase leisure time spent walking, thereby benefiting residents' physical health (Kramer et al., 2014). However, planting trees without proper maintenance can sully residents' perceptions of the neighbourhood (Mehdipanah et al., 2013).

The SHARP programme found that residents moving into new neighbourhoods significantly increased neighbourhood satisfaction, primarily because of the decrease in antisocial behaviours, such as vandalism, drug dealing, drug use, and alcohol consumption (Petticrew et al., 2009). Reductions in crime also increase the sense of safety (Kearns et al., 2011). However, Kearns and Mason (2015) demonstrated that out-movers have worse health behaviours than people who are stationary, potentially due to disruptions in personal support. Additionally, rehousing residents in newly built housing significantly diminishes reported issues such as dampness and cold, indicating that housing improvements improve health; however, housing repair fees may be increased, which reduces the affordability (Petticrew et al., 2009).

Implementing regeneration programs often requires many years of clearance and demolition, requiring residents to remain in the same area undergoing deconstruction before rehousing. Despite the common critique of regeneration's potential to harm neighbourhoods due to demolition and clearance, the evidence indicates no significant connection between demolition and potential harm (Petticrew et al., 2009).

2.5.3 Socioeconomic interventions

Regeneration projects, especially area-based initiatives, include a range of socioeconomic interventions targeting the broader socioeconomic issues related to education, employment, and healthy behaviours. For example, the Neighbourhoods Law programme involved regenerating community centres, such as health and medical centres, sports centres, and language centres. Evidence suggests that community centres can help residents learn new skills and fortify community cohesion (Mehdipanah et al., 2013). Community pride and participation are essential elements in the Neighbourhood Renewal Strategy (Kelaher et al., 2010). Other evaluations have demonstrated that perceptions of improvements in community centres and neighbourhood might only be relevant if residents are rehoused in new areas (Petticrew et al., 2009).

Based on deprivations in income, education, employment, health, crime, and access to services, the NDC programme selected 39 poor districts. Improvements in the community, unemployment, health, education, and housing were all included in the investments. For deprived areas in particular, although the projects were not evaluated individually, the interventions increased the number of people with qualifications and higher education levels (Stafford et al., 2014), thereby increasing employment (Stafford et al., 2008), emphasising the importance of including the multifarious dimensions of investments in

regeneration projects. The Neighbourhood Law project also considered regeneration's multi-dimensional nature, incorporating gender equality, new technologies such as solar panels, and sustainable aims such as energy efficiency into projects (Mehdipanah et al., 2014).

As with NDC, the DDA program in the Netherlands also targeted deprived areas, delivering a range of interventions related to housing quality, neighbourhood regeneration, footpaths and cycle tracks, and sports facilities (Kramer et al., 2014). However, the impact on mortality was inconsistent across the areas of the intervention (Cotterill et al., 2008). Additionally, the intervention reveals the limited influence on leisure time cycling and sports in the targeted deprived areas (Kramer et al., 2014).

The evidence of the impact of the interventions on life satisfaction is also mixed. While NDC found no significant changes in overall life satisfaction in the intervention areas or comparison areas (Walthery et al., 2015), a significant difference was observed in the NR project (Kelaher et al., 2010). Impacts on self-rated health were also unclear. While no evidence of overall improvements or diminutions in self-rated health was identified (Walthery et al., 2015), there was seemingly a decline in the likelihood of poor self-rated health, although the result was not significant (Stafford et al., 2014).

2.5.4 Investment

Evidence suggests that investments in regeneration (different combinations of housing improvements, social programmes, and demolitions and new buildings) can impact the regeneration results. The GoWELL program and the Neighbourhoods Law project both demonstrated that higher investments in targeted areas with 'higher need' may result in more significant mental and physical health improvements. Specifically, increased investments can improve mental health (Egan et al., 2016; Mehdipanah et al., 2014) and self-rated health in the long-term (Mehdipanah et al., 2014). It can also improve occupants' trust towards government and community participation, which also appears to amplify residents' perceptions of hope, influence, and control over the future (Shield et al., 2011).

Furthermore, the intensity of investment can be measured based on the number of residents reached and the magnitude of environmental changes in different policy areas, such as employment, housing conditions, safety, and social cohesion (Jongeneel-Grimen et al., 2016). Environmental interventions or changes include a broad range of interventions, such as housing quality, neighbourhood spaces, footpaths and cycle tracks,

etc. (Kramer et al., 2014). The DA programme revealed that the increasing intensity of the intervention is linked with significant improvements in mental health (Jongeneel-Grimen et al., 2016), especially in deprived areas (Egan et al., 2016; Jongeneel-Grimen et al., 2016; Stafford et al., 2014), highlighting the potential role of regeneration in improving people's health and mental health in deprived areas.

As Jongeneel-Grimen et al. (2016) posited, the regeneration program can 'at least prevent the widening of social inequalities for selected outcomes between the most and least deprived groups of areas'. However, other studies have noted that the physical activity trends are not influenced by the intensity of environmental interventions, particularly for leisure time cycling and sports (Kramer et al., 2014).

In summary, a pathway diagram was presented that links decision-making to regeneration impacts. The pathway identified four categories of decisions, namely housing, neighbourhoods, socioeconomic interventions, and investments, which can impact the outcomes of urban regeneration.

2.6 Discussion

Urban regeneration frequently seeks to enhance social, economic, and environmental benefits; however, the current insights regarding the decisions that might affect regeneration results are limited. This chapter has endeavoured to close that gap. This section discusses the implications of researching decision-making related to regeneration, the limitations, and next steps.

2.6.1 The complexities of decision-making regarding urban regeneration

The pathway diagram indicates the complexity of decision-making in relation to improved regeneration outcomes. Overall, there are more reports focusing on the influence of housing and neighbourhood design elements. While the housing design provides curative effects in terms of improving physical health and potential minor improvements in mental health, the pathway makes it evident that there is contradictory information about neighbourhoods and housing design decisions. In alignment with previous literature (Curl & Kearns, 2015; Thomson & Thomas, 2015), the review suggests that the evidence concerning health is contested, although the research regarding poor housing conditions and health has been well-established.

The existing research regarding urban renewal decision-making is dominated by several pivotal areas, such as community engagement and viability assessments; conversely,

minimal attention has been devoted to the overarching complexity of decision-making (see more from Huang et al., 2020). The diagram suggests that decisions concerning not only the physical layout of homes and neighbourhoods but also socioeconomic interventions and investments are necessary to improve a population's well-being through urban regeneration. Community involvement and investment choices that focus on underprivileged neighbourhoods have the potential to improve regeneration outcomes immensely. Socioeconomic interventions such as providing training, employment, and behavioural interventions can improve the results, illustrating the importance of community engagement through actions such as establishing alliances locally, connecting with locals, and constructing community centres to explore local needs constructively. Additionally, investment decisions, mainly those involving investing in deprived areas with higher-intensity environmental interventions, can significantly improve occupants' mental health and health, highlighting the importance of financial assessments in urban regeneration projects and the prioritisation of resources.

The pathway diagram highlights the risks of unintended consequences. For example, some residents noted that demolition and vandalised parks increased perceptions of danger, thereby diminishing children's opportunities for outdoor activity (Egan et al., 2015). The increase in police surveillance, while potentially decreasing perceptions of danger, can jeopardise trust and respect due to the 'threat, abuse and violent treatment of police towards youth and immigrants' (Mehdipanah et al., 2013). Egan et al. (2015) also suggested that individuals' positive and negative narratives around rehousing and relocation depend on their perceptions of their new homes and neighbourhoods. The results demonstrated that while socioeconomic interventions are critical for well-being and health, they may have limited benefits for deprived areas. Additionally, while changes in location can be beneficial, this depends on the social circumstances and the new neighbourhood that the tenants move into.

Finally, the review suggests that decision-making must balance multiple areas. In an urban planning context, high-level decisions often occur during the early stages of housing projects, including site analysis and appraisals to make a business case for the regeneration and prioritisation of sites. As regeneration projects frequently take decades and involve a range of stakeholders, understanding how decision-makers attend to various aspects of urban regeneration at various times can be critical in maximising regeneration outcomes.

2.6.2 Limitations

The review's reliance on data measured and published in the selected regeneration studies is one of its limitations. Depending on the timing of the evaluation, the results may differ, and regeneration outcomes can take a long time to unfold. For example, the decanting process could temporarily disturb residents' well-being, but long-term sustainability and health would accumulate during the housing stock's lifespan. Consequently, decisions that are based on short-term or long-term benefits can vary. The outcomes also depend upon what factors are evaluated and reported, indicating that further appraisals of evaluation measures that include health and sustainability-related processes are necessary to advance our understanding of regeneration.

Another limitation is the consideration of sustainability outcomes and their relationships to population health and well-being, as the effects were only marginally covered in the reports. There are ongoing debates regarding whether demolition would reduce greenhouse gas emissions (Crawford et al., 2014; Power, 2010). In the review, one study indicated that warmth interventions are a component of housing rehabilitation and can boost energy efficiency; for instance, following regeneration, 80% of the Glasgow HA's stock became more energy efficient (Curl et al., 2015). Another study noted that heating systems can be more expensive for residents (Egan et al., 2015), limiting the potential impact of reducing financial anxiety and improving mental health. However, it is unclear how warm treatments generally affect health and well-being.

The last limitation is that the description of the decision-making process, especially regarding perceptions of evidence and information, is not available; this has stymied the elicitation of feedback linking decision-making and regeneration outcomes. The process of decision-making and barriers to decision-making are not evident, despite the pathway diagram highlighting the complexities and potential areas that decision-makers must consider.

2.6.3 Next steps

The pathway review identifies two key research directions. Firstly, as the health-related and sustainability evidence regarding regeneration is mixed and since decision-making involves various aspects and complexities, information flows into the decision-making process may be a crucial area for future research. Previous studies have suggested that perceptions of regeneration evidence and relevant benefits are critical information for

decision-making (Pineo & Moore, 2021). However, the decision-making process and the main tensions are not clear. CHAPTER 5 discusses this in greater detail.

Secondly, the intensity of investments in environmental interventions might affect the regeneration outcomes. As the values and identities of individual actors can influence decision-making (Cloutier & Ravasi, 2020), the priorities behind decision-making may differ. Thus, it is necessary to understand how to combine and prioritise the financial resources to achieve the intended results. CHAPTER 6 and CHAPTER 7 discuss this in greater detail.

CHAPTER 3

Urban regeneration in England and the role of housing associations

3.1 Introduction

Regeneration often focuses on areas with higher levels of deprivation, such as those with a high concentration of social housing. The pathway diagram presented in CHAPTER 2 highlighted the complexity of decision-making in the context of regeneration and in areas that require attention.

This chapter aims to provide background knowledge regarding urban regeneration in England and concerning English HAs. This chapter is organised as follows: Firstly, it summarises urban regeneration in England, delineating the policy agenda and social housing regeneration. It then summarises the context of the English HAs.

3.2 The urban regeneration agenda in England

This section summarises the timeline and policy agenda of social housing regeneration.

3.2.1 The historical agenda of urban regeneration

In the 1970s, an economic crisis magnified the need for growth through the promotion of development. Area-based initiatives, which sought to intervene in the problems associated with specific places or territories, started to attempt to intervene in broader processes of social and economic change. In the early 1980s, the term ‘urban regeneration’ was coined to refer to endeavours to reverse industrial decline through property-led urban development. This property-led regeneration was characterised by ‘market-led strategies to lever private property investment and a transfer of policymaking from the public to the private sector’ (Edwards & Imrie, 2015, p. 62). While the concept of using property-led responses strongly emphasises private-sector investments and focuses on economic issues rather than social ones, it strengthens the place-based focus of urban policy, spurring policy responses to account for social, economic, and environmental issues more heavily (Edwards and Imrie, 2015). The UK's regeneration during this time has been distinguished by the property development industry's tight collaboration with the public sector, driven by local councils.

Since the 1980s, urban policy has placed a strong emphasis on issues of inequality and the creation of mixed-tenure developments, shifting towards a more holistic approach to regeneration. Since the UK's New Labour administration assumed power in 1997, significant political effort has been expended to combat social exclusion by adopting programmes that narrow the gap between the most disadvantaged groups and the rest of society. For instance, the NDC, created between 1998 and 2011, aimed to improve 39 underprivileged neighbourhoods. For rigorous regeneration in six areas, namely health, housing, liveability, education, employment, and crime, each region received 50 million pounds. The programme's evaluation studies were reviewed in the previous chapter (see Stafford et al., 2008; Walthery et al., 2015).

Since 2008, with the advent of fiscal austerity in the UK in response to the economic recession and contraction, the responsibility of driving urban redevelopment has been shared between the national government, local authorities, HAs, private developers, and community organisations. Generally, the national government sets policies and provides funding and regulatory frameworks, while local authorities, HAs, private developers, and community organisations collaborate to advance regeneration projects. The recent regeneration agenda specifically stresses both high-quality homes and social housing regeneration, which are summarised in the next two sub-sections.

3.2.2 The recent agenda regarding quality housing

Over the last few decades in England[4], national and local housing policies have increasingly stressed the objective of increasing the quantity and quality of homes (Greater London Authority [GLA], 2020; Ministry of Housing, Communities & Local Government [MHCLG], 2020). Policy initiatives and instruments have also been devised to execute the objective. For instance, the Decent Homes initiative sought to guarantee that all social housing in England complied with the Decent Homes Standard, a set of minimal requirements regarding quality and conditions. The evaluation criteria included the presence of central heating, a reliable water heating system, and sufficient sound insulation between homes. The initiative was supported by the Department for Communities and Local Government (DCLG) in England and ran from 2000 to 2010.

[4] This section is adapted from a peer-reviewed journal (see the Published Paper Declaration) and updated with recent policy agenda.

Another exemplar is the Housing Health and Safety Rating System (HHSRS), which was implemented in 2006 as a component of the Housing Act 2004. Its purpose was to detect and evaluate risks and hazards in housing, including excessive cold, falls, fire, damp and mould growth, electrical hazards, entry by intruders, and structural failures (Great Britain & Office of the Deputy Prime Minister, 2006). The term ‘decent home’ was revised in the same year to adhere to HHSRS standards, which classify decent homes as being reasonably well-maintained, providing access to contemporary amenities, and offering adequate thermal comfort. Non-decent dwellings are defined as those that have one or more severe HHSRS dangers. In London, far fewer HAs and council houses are substandard (GLA, 2020).

The government's strategic planning policies for England are delineated in the National Planning Policy Framework (NPPF; MHCLG, 2021). Since its original version was published in 2012, this is the fourth iteration. A set of suggestions to reform the current planning system in England was made public by the government survey Planning for the Future in August 2020 (MHCLG, 2020). This proposed reform's stated objectives were to ‘streamline and modernise the planning process’ and ‘put a fresh focus on sustainability and design’ through systemic changes to the planning process (MHCLG, 2020, p.4). The consultation acknowledged that the current process for negotiating developers’ contributions to affordable housing and infrastructure is unclear and complex.

In July of 2021, the DLUHC, the successor to the MHCLG, will be responsible for policies and strategies regarding housing, planning, and local government. The DLUHC has a range of initiatives to support regeneration in the UK. For example, the DLUHC announced that the government would invest 2.6 billion pounds in the UK’s Shared Prosperity Fund to support the regeneration of 20 towns and cities, indicating the government’s continuous policy commitment to regenerating and improving homes (DLUHC, 2022b).

3.2.3 The focus of social housing regeneration

Another recent focus on urban regeneration stresses the role of social housing, particularly in the wake of the Grenfell Tower disaster in 2017, which led to a renewed emphasis on improving the quality of social housing and involving residents in the decision-making process regarding regeneration projects.

The goal of social housing regeneration is to provide low-income and vulnerable populations with higher-quality housing while addressing problems including overcrowding, unsanitary conditions, and a lack of facilities and services. It also aims to encourage social and economic inclusion. From 1997 onwards, social mix policies have underpinned several social housing regeneration initiatives, such as NDC. The idea is that that regeneration can potentially foster opportunities for social integration through cross-tenure interactions and can enable social and economic capital development. In Dublin, the basis of social housing regeneration is also that the social housing is 'dysfunctional and unsustainable', and regeneration activities can consider positive social and environmental outcomes to sustain the community development (Redmond & Russell, 2008).

Specifically, the social mix policies that underlie regeneration can change the tenure components in the area by adding additional tenures to places that were once constructed as single-tenure social housing estates or by moving social rental and affordable homeownership to newly constructed private market projects. The results of social housing regeneration are mixed. In the UK, research found that new HA developments can enable some vulnerable populations to live in less deprived areas, although it can be more difficult to reduce an area's deprivation through the introduction of tenure mix policies in social housing regeneration, which aims to combine a range of tenure options including owner-occupier, shared ownership, and rental housing (Crook et al., 2016). Research has found that regular interactions in mixed-tenure neighbourhoods during regeneration might promote a sense of community; however, social mix policies conflict with social housing access policies, which can cause tensions amongst social housing tenants (Souza, 2019). A case study in Glasgow demonstrated that the social housing regeneration activities benefited the employment of men and individuals without dependent children, indicating the inequalities in benefit allocations (Zhang et al., 2022).

Urban regeneration in deprived areas where social housing is the predominant tenure has drawn criticism. For example, the 2012 Olympics regeneration scheme, alongside other regeneration schemes in East London, resulted in limited benefits for working class East Londoners (Watt, 2013). Other researchers have reported that the spatial concentration of deprivation is a persistent issue. To address social problems in deprived areas, even a holistic approach, such as area-based urban regeneration programmes that consider determinants of health, may still be insufficient to overcome the excessive physical health

burden or to reduce the relative inequalities in mortality and mobilities in deprived areas (Kearns et al., 2021). If the housing management strategies remain unchanged, the differentiated treatment of social renting tenants may reinforce tenure-related prejudice, and working-class and low-income households might still be excluded (Manzi, 2010). In fact, the risks of social housing residualisation, which refers to when social housing only provides a 'safety net' for those who cannot obtain suitable accommodations in the private sector, has generated extensive discussions (Forrest & Murie, 1983; Pearce & Vine, 2014).

Social housing regeneration can include a range of interventions, such as the refurbishment of existing properties, demolition and replacement with new homes, improvements to the surrounding public spaces and infrastructure, and the provision of community facilities and services. A key component of social housing regeneration is community involvement, as it enables the discovery of social and physical transformation goals at the local level (Stewart & Rhoden, 2003). However, depending upon the community's perceptions of regeneration, community responses can vary. For example, during the housing crisis, local authorities in London attempted to demolish and redevelop council properties but faced intense community activism that opposed demolition (Sendra, 2018).

3.3 The context of English housing associations

Since the 1980s, within the UK, HAs have played an essential role in providing social housing within successive government social housing policies. However, due to the welfare reform and successive legislative changes, HAs have been exposed to competition from private registered providers. HAs now operate at the intersection between the private rental housing market and the public social housing sector, imbuing regeneration projects with myriad complexities. This section elucidates research regarding the context of English HAs[5].

3.3.1 Housing stock and households

In 2021, there were 23.7 million occupied residential dwellings in England (DLUHC, 2022a). Of these dwellings, 10% (2.4 million) were managed by HAs. As illustrated in Figure 3–1, over three quarters of HAs' and local authorities' properties are in the most

[5] This section is adapted from a peer-reviewed journal (see the Published Paper Declaration) and with detailed descriptions.

deprived and the 2nd to 5th most deprived areas in England, indicating the importance of social sector developers in influencing social equality.

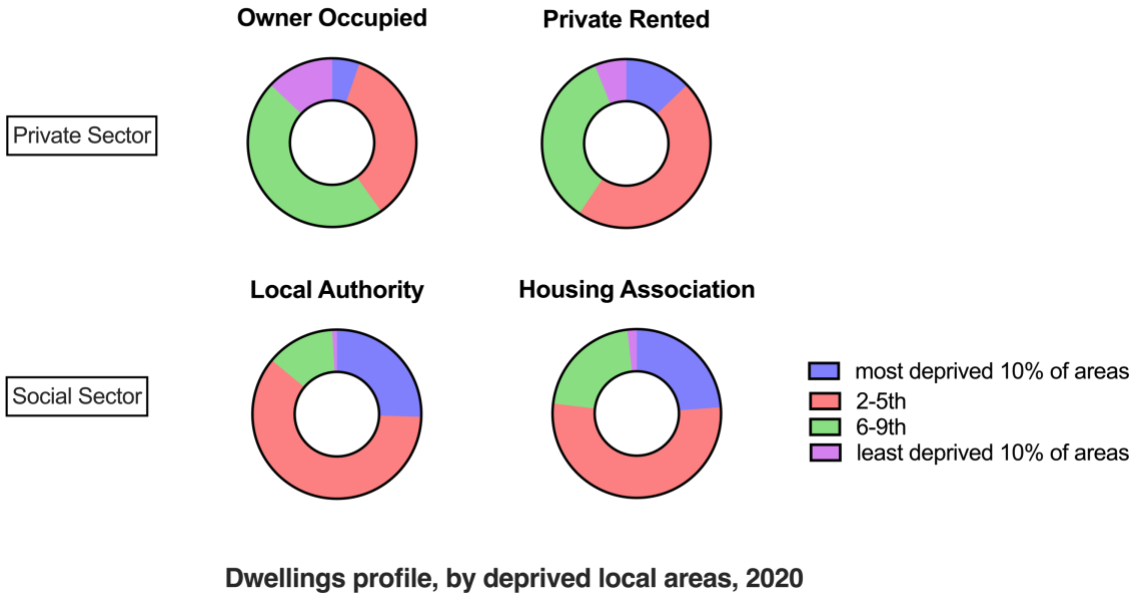

Figure 3–1: Dwellings by deprived local areas, 2020. Source: DLUHC 2022a.

The recognition of the impact of poor housing quality on people's quality of life has been explicitly recognised. In March of 2022, the government publicly listed failing social housing providers that were breaching consumer standards through severe forms of 'maladministration' (Housing Ombudsman, 2022). Common complaints regarding social housing conditions pertain to the following: the failure to meet Decent Homes Standards or HHSRS hazard requirements, the issue of overcrowding, and dampness. The Minister of Social Housing indicated that social housing landlords' regulations will be fortified to halve the number of non-decent rented homes by 2030 (DLUHC, 2022c).

Furthermore, the government published the 'Levelling Up the United Kingdom' policy paper, which specified that by 2030, the government aims to decrease the number of indecent homes by 50%, especially with a focus on improvements in the lowest-performing areas, including the privately rented market and the lowest-income areas (DLUHC, 2022b). According to the Levelling Up programme, a 2.6 billion pounds UK shared Prosperity Fund will be invested to restore the community and places. Local initiatives include reducing litter and anti-social behaviour and promoting local businesses. In 2023, the government made a commitment to establish programmes to improve the quality of social housing, including requiring social landlords to remedy

hazards, such as damp and mould, in their homes within stringent time limits (DLUHC, 2023).

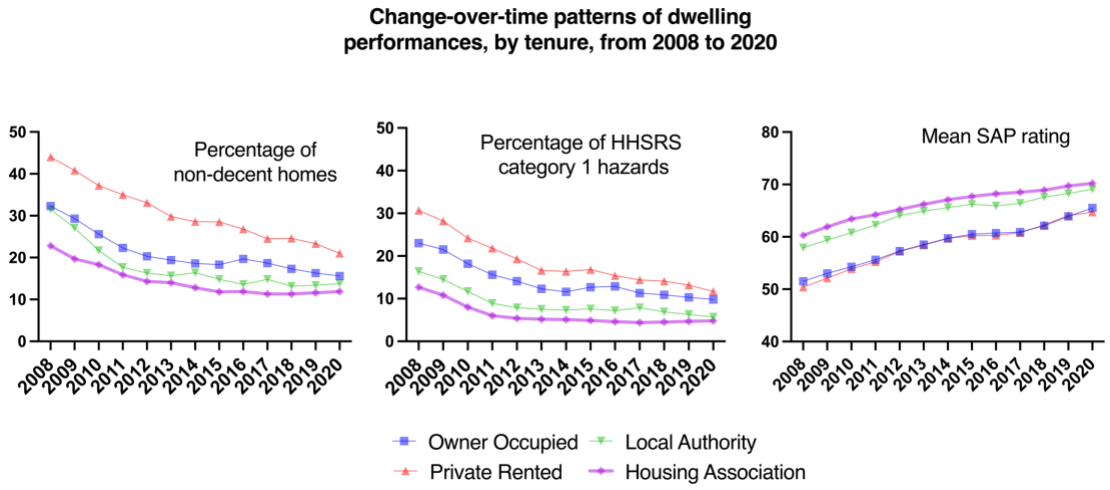

Figure 3–2: Change-over-time patterns of dwelling performance, by tenure, from 2008 to 2020. Source: DLUHC 2022a.

As shown in Figure 3–2, although the quality of social housing has been frequently criticised, the EHS has indicated that with only 11% of occupied non-decent houses, social rental stock has the lowest percentage of such residences compared to other types of tenures (DLUHC, 2022a). In 2020, 14% of owner-occupied homes and nearly 25% of private rental dwellings with occupants were substandard (DLUHC, 2022a). According to the London data, one in seven (about 14.3%) social homes fail to meet decent standards (GLA, 2020). Regarding energy efficiency, the SAP rating for socially leased homes is similarly higher than for other tenures, with a mean score of 70 as opposed to 65 for privately rented and owner-occupied homes (DLUHC, 2022a).

3.3.2 Regulations of social housing

In England, the Regulator of Social Housing (RSH) is an independent body that establishes standards that all registered social housing providers must meet. The regulator's objectives were initially delineated in the Housing and Regeneration Act in 2008. There are two types of regulations with which social landlords must comply. The first are regulations that focus on monitoring economic issues (including the Governance and Financial Viability Standard, the Value for Money Standard, and the Rent Standard). Conversely, the second type of standards focuses on addressing consumer issues and aims to ensure that homes are decent and safe for tenants. The RSH distinguishes between four consumer standards: the Home Standard, the Tenancy Standard, the Neighbourhood and

Community Standard, and the Tenant Involvement and Empowerment Standard. According to the Housing Ombudsman explanation, as the RSH primarily focuses on economic regulations rather than consumer standards, the process of determining whether the social landlords are resolving tenants' complaints and complying with consumer standards is not sufficiently straightforward (DLUHC, 2022c).

Social housing in the UK typically refers to housing that is owned and managed by registered providers (RP) of social housing, including local authorities or private registered providers such as HAs, and that is rented out at below-market rates to people in need of affordable housing. As a result of the Housing and Regeneration Act (2008), HAs directly compete with the for-profit social housing landlords that are RPs for the provision of affordable housing. Furthermore, the 2015 General Election extended the Right to Buy (RTB) to HAs and restricted rent increases (Manzi & Morrison, 2018).

3.3.3 Housing associations' decision-making

Several watershed changes in regulations and policies have underpinned research regarding HAs' decision-making. The mid-1970s ushered in a critical shift in HAs' decision-making, as neoliberalism emerged, heralding reductions in public expenditures and the restructuring of social welfare policies (Jacobs & Manzi, 2017). In the UK, the RTB programme was introduced in the Housing Act of 1980, which promoted the sale of social housing at substantial discounts. It dramatically shifted housing ownership by giving tenants the legal right to buy their homes from councils. With the severe cuts in the housing budget and the restrictions of social housing developments, a common perception emerged that social housing, referred to as 'residual social housing', should be reserved for only the most impoverished populations (Malpass, 2001).

Although HAs have typically been non-profit organisations that receive government funding to build social housing and that are overseen by the RSH, they also make sizable contributions to developing brand-new private homes for sale or rent, cross-subsidising their social goals. Increasing research has framed HAs as 'hybrid' organisations that incorporate competing demands in their decision-making and practices (Blessing, 2012; Jacobs & Manzi, 2020; Morrison, 2016; Mullins, 2012; Sacranie, 2012). This 'hybridity' refers to the tensions involved in fulfilling commercial and social goals in their decision-making (Jacobs & Manzi, 2020; Mullins, 2000).

Different patterns of hybridity have been identified in changes to HAs' accountability to the government and the private sector (Mullins, 2006) and asset management strategies (Morrison, 2017). Additionally, changes in housing policies have shaped HAs' perceptions of market-based values, driving decisions regarding prioritising assets or disposal strategies and recruiting board members with financial and legal expertise rather than community experience (Jacobs & Manzi, 2020).

However, despite HAs' commitment to delivering social mission goals (Manzi & Morrison, 2018; Tang et al., 2017), research has noted that conflicting social and commercial purposes can impose a range of unintended consequences, such as failures to provide quality housing and exaggerating the housing crisis (Manzi & Morrison, 2018). Drawing from institutional logic, Morrison (2013) found that the conflicting regulatory context pushed HAs to either dispose of non-decent dwellings or to retain them with minimal repairs to meet the government's housing standards.

3.4 Gaps and next steps

In summary, the renewed focus on social housing regeneration in policy agendas illuminates the importance of understanding HAs' decision-making in relation to providing improved homes for vulnerable populations. However, due to a series of policy and regulation changes in the social housing sector, HAs face pressures to meet market-oriented demands in their decision-making. The 'hybrid' perspectives of HAs shed light on the complexity of decision-making and HAs' approaches to regeneration.

While the research has suggested various strategies for HAs to search for new business models, it is not clear how the embedded hybridity within the HAs influences the delivery of sustainability goals in urban development projects. Even while housing regulations and councils are pushing for more environmentally sustainable dwellings, a lack of awareness regarding how decisions are made will likely result in unintended policy failures. In the subsequent chapters, this research explores the HAs' decision-making regarding regeneration projects, with a focus on how their decision-making influences health and sustainability outcomes, as well as the role of policies and regulations.

CHAPTER 4

Methodology

4.1 Introduction

This research focuses on understanding English HAs' decision-making processes in urban regeneration. CHAPTER 2 summarised the elements that decision-makers must consider achieving improved health and sustainability outcomes. CHAPTER 3 examined the urban regeneration agenda and HAs' decision-making challenges induced by the conflicting role of balancing missions and markets as hybrid organisations. This chapter provides an overview of the methodology. First, it introduces the theoretical lens and how multiple theories were combined. It then presents the data collection and analysis for the case study. Finally, the workshop information is presented.

4.2 Theoretical lens

This section summarises fundamental decision-making theories.

4.2.1 Bounded rationality and attention

The foundational modern view of organisational decision-making arose from Simon's (1957) work on bounded rationality, which accounts for the limitations of human cognition and information processing capacity. In contrast to the traditional criteria for decision-making, such as maximising profits, it considers limitations in individual cognitive processes and organisational structures that restrict decision-making. The notion of bounded rationality implies that decision-making is based on incomplete information, biased cognitive processes, and insufficient cognitive resources. Individuals use heuristics or rules of thumb to make complex decisions simpler rather than acting entirely logically (Simon, 1982, 1988). Rather than optimising the result, people make decisions to satisfy their minimum requirements (Simon, 1982). Furthermore, March (1994) emphasised the role of the organisational culture, norms, and the social context in shaping decision-making within organisational settings. One of the key concepts within organisational decision-making is attention as a cognitive resource. The notion of bounded rationality emphasises the cognitive limitations and the role of attention in shaping decision-making (Simon, 1957). Additionally, the attentional process wherein individuals notice certain aspects of the environment based on their cognitive structures and past experience is critical within organisational settings (March, 1994).

4.2.2 Attention in neuroscience

In neuroscience, selective attention means that a small part of the information is selected and analysed in real time when there is an information overload (a 'deluge of data'). The non-attended portion of the input is processed at a reduced bandwidth. As shown in Table 4-1, the process of attention allocation in neuroscience can occur in two processes: 1) bottom-up, exogenous, where attention is driven by sensory input, or 2) top-down, endogenous, where goals and expectations drive attention.

Table 4-1: Triggers of attention in neuroscience. Source: Tsuchiya & Koch (2014)

	Bottom-up, exogenous	Top-down, endogenous
Description	Stimulus-driven	Schema-driven
Cues	Image-immanent features that attract attention. Flicker, motion, colour, orientation, depth, or texture are attributes of the object	Input selection is impacted by the space (focal attention), feature (feature-based attention) or an object (object-based attention)
Salient cues	When the object attribute differs significantly from its value in the neighbourhood	When the tasks or goals are performed

Scholars have debated the impact of attention in decision-making and its interactions with other cognitive processes, such as memory and reasoning (Oberauer, 2019). Additionally, many factors, such as emotion, and motivation, can influence decision-making (Boag et al., 2019; Lerner et al., 2015). Emotions can also shape the focus of attention (Vuori, 2023; Vuori & Huy, 2016).

In both the organisational and neuroscience fields, a critical pathway by which attention influences decision-making is by directing and focusing cognitive resources on the most relevant or important information and options. While the focus of attention may not necessarily determine the outcome of a decision, this research argues that the focus of attention is still vital, as it provides insights into the cognitive and psychological processes involved in decision-making and helps to identify potential challenges and approaches to mitigate.

4.2.3 Attention-based views

Regarding organisational decision-making, a meta theory of attention and decision-making is the ABV, which specifically addresses how attention is managed in organisational settings (Ocasio, 1997, 2011). Within ABV, attention is defined as the

‘noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on issues and answers’ (Ocasio 1997, p. 189).

According to ABV, the organisation is a system of structurally distributed attention. This attentional frame suggests that individuals selectively attend to certain aspects of the issue while filtering out other information. The stability of attentional resources indicates the major strategic decisions over time (Ocasio & Joseph, 2005, 2018). Inspired by neuroscience perspectives, the organisational attention perspective proposes that decision-making frequently involves sequentially utilising three attentional resources: selective attention, attentional vigilance, and executive attention (Ocasio, 2011). Selective attention means focusing on a specific set of sensory stimuli at a moment in time. Executive attention involves decision-makers allocating controlled (nonautomatic) cognitive resources to problem-solving and decision-making.

The ABV believes that both top-down and bottom-up mechanisms influence managers' strategic actions (Shepherd et al., 2017). Specifically, bottom-up perspectives focus on individual sense-making and ecological perspectives, such as how environmental cues, as demonstrated in relation to the visibility of electronic documents, change individuals' information-filtering processes (Hansen & Haas, 2001). The bottom-up theories emphasise that attentional processes are shaped by cognitive and perceptual processes (such as working memory and cues detection) that occur during information processing (Oberauer, 2019).

In contrast, top-down views, such as the behavioural theory of the firm, focus on the role of sequential attention allocation (March, 1994). Greve (2008, p. 480) described attention allocation as a sequential process through which decision-makers ‘attend to one goal at a time and move to the next goal when performance on the first is above the aspiration level’. Other top-down rationales include the board compositions (Tuggle et al., 2010), top managers’ roles (Maula et al., 2013), organisational coalitions, and power (Greve & Zhang, 2017) as factors that influence attention allocation. Institutions also strongly influence the strategic agenda and process (Ocasio & Joseph, 2018). The dominant logic[6] could affect which issues decision-makers prioritise. For example, in the higher education publishing industry, changes in the prevailing institutional logic, from editorial to market

[6] In this methodology chapter, the theory introduced is ABV, which is the theoretical lens used for the first portions of findings presented in Chapter 5. As the notion of institutional logics informed the development of the simulation model, which is the second portion of findings presented in Chapter 7, theories of institutional complexity and logics are included in chapter 6 with details.

logic, could influence decisions in executive succession planning (Thornton & Ocasio, 1999).

Overall, for ABV, social structures such as rules, communication channels (Ocasio et al., 2015, 2018), and power (Ocasio, 2017) influence attention allocation and organisational strategies regarding specific issues (Ocasio et al., 2015). Successful strategic performance strongly requires sustained attention toward developing, implementing, and elaborating upon ideas within the strategic agenda (Ocasio & Joseph, 2018).

The theoretical lens of bounded rationality and ABV has been used to guide this research for the following reasons:

1. The attentional perspectives recognise that decision-making is a dynamic process that is shaped by the cognitive and social factors. Rather than assuming that individuals make decisions based on a rational evaluation of costs and benefits, the ABV considers the dynamic interplay between individual cognitive processes and institutional factors in shaping and bounding the decision-making.
2. Place-making and regeneration involves multiple stakeholders and cross-domain information related to places, sustainability, and health and well-being. Understanding the attentional processes is crucial for designing effective regeneration strategies that consider the wide range of environmental information that decision-makers must attend to.

In summary, the study is grounded in bounded rationality and ABV. As the competing dynamics were illuminated in the qualitative analysis (see results in CHAPTER 5), theories of institutional logics were further examined to explore how attentional resources shift when multiple logics conflict or coexist, as explained in CHAPTER 6.

4.3 Theory building and philosophical positions

This section describes how multiple theoretical lenses have been combined to inform the data analysis and to build the theories.

4.3.1 The use of multiple theories in data analysis

Although the ABV is closely linked with institutional theories and the notion of bounded rationality, multiple theories were used in this research to inform the data analysis and to build the theoretical contributions. The use of multiple lens supports the synthesis of pieces of knowledge across disciplines, but it is necessary to justify how different theories

could be combined. Following Okhuysen and Bonardi's (2011) suggestions, this part legitimises the theoretical underpinnings using two criteria: the proximity of the theoretical lens and the compatibility of the underlying assumptions. First, the theoretical lenses of institutional perspectives, ABV, and bounded rationality are intertwined in this context, as they focus on attention as a key cognitive resource and on environmental factors in bounding and shaping decision-making. Second, the basic assumptions of the theories are consistent in that the theories suggest that constrained rationality is a fundamental restriction of judgment.

Drawing from existing research on theoretical synthesis (Boxenbaum & Rouleau, 2011) and recommendations of case studies for advancing the current theoretical lens (Ridder, 2017), Table 4-2 summaries key dimensions of assumptions of this case study and provides a foundational rationale behind the theoretical lens.

Table 4-2: Dimensions of the theoretical underpinnings behind the rationale of this project

Dimensions	Summary of the features and elements of this project	
Phenomenon	The phenomenon of decision-making in response to multiple aspects within urban regeneration and the exploration of how attention can more closely focus on sustainability and health	
Theoretical aims	Develop novel connections and new theories related to managing attentional resources to achieve improved outcomes in terms of sustainability and health in place-based solutions	
Theory	Status of theory	Bounded rationality, attention-based views, and institutional perspectives in organisational decision-making
	Integration of existing theories	The proximity of the theoretical lens: Close
		Compatibility of underlying assumptions: Compatible
	Purpose of multiple theoretical lens	Generate a novel understanding of the attentional allocation with the presence of multiple institutional logics
Research Strategy	Search for the causal mechanisms behind attention allocation in case studies to understand what contributes to and shapes attentional patterns	
Data collection and analysis	Data collection	Documents; meeting observations and interviews; workshops
	Data analysis	Qualitative analysis; simulation modelling

4.3.2 Building theories with a systems perspective and rigour

Building generic theoretical models and conceptualisations is critical, as this research aims to generate theoretical insights. For this reason, grounded theory analysis was selected as an umbrella method to allow an in-depth theoretical exploration to discover novel theories from data systematically obtained from social research (Gioia et al., 2013). The role of understanding dynamics and complexities has been thoroughly highlighted in previous qualitative research (Poole, 2018); however, the process of building insights and theoretical models from qualitative research remains limited. Additionally, simply identifying the linear decision-making processes or adding field-level examples of institutional process is insufficient to understand the complexities of managing health and sustainability issues (Greenwood et al., 2014).

The study aims to extend and build novel understandings of existing theoretical lens in managing attention in complex settings such as urban regeneration. The method of theory building must capture both the 'concepts' (general and less well-defined notions that encapsulate the theoretical phenomenon) and 'constructs' (theoretical measurements and attributes that operationalise the theoretical phenomenon (Gioia et al., 2013). To refine and expand the theories, which are often what qualitative research is predicated upon, researchers must strategically balance the need to ground assumptions in prior constructs or views and to contextualise the interpretations and insights from the 'knowledgeable agents', namely the people who work within the organisational realities (Gioia et al., 2013).

A critical component of the building theoretical insights is ensuring the research process's validity. Glaser and Strauss (2017) described a set of approaches to establish the 'credibility', 'plausibility', and 'trustworthiness' of rigorous qualitative research. Conventional terms, such as internal validity, reliability, objectivity, and external validity, have been used. Validity in SD refers to the confidence, rigour, and robustness of the process (actual strategies for collecting and analysing data) and the insights (results) (Lane, 2015).

The methodology combines multiple theoretical lenses, grounding data collection and analysis in SD approaches. Throughout the data collection and analysis process, the following steps were implemented to ensure methodological rigour in building theorical insights (see Table 4-3). The next section describes each data collection and analysis element with detailed steps.

Table 4-3: Steps to enhance theory development

Key steps to enhance theory development with a systems lens		Methodology source
Research design	1. Well-defined research questions after initial conversations with the 'knowledgeable agents' in the urban regeneration context	(Gioia et al., 2013)
	2. Initially consulted with the existing literature focusing on urban regeneration and decision-making challenges and the prominent theoretical lens in HA contexts	(Gioia et al., 2013)
Data collection	3. Amplified the voices of HA managers and regeneration team members, who were treated as knowledgeable agents through interviews, meeting observation, and participatory workshops	(Gioia et al., 2013) (Hovmand, 2014)
	4. 'Backtracked' prior informants to ask questions from subsequent interviews; validation-type interviews were conducted after interviews and in-between meeting observations	(Gioia et al., 2013)
Data analysis	5. Performed initial data coding and produced 1st-order terms at multiple levels (a process akin to open coding in traditional grounded theory coding)	(Gioia et al., 2013) (Strauss, 1998)
	6. Elicited change-over-time patterns of attention allocation based on the co-occurrence of codes from the 1st order terms	(Poole, 2018)
	7. Organised the 1st-order themes into a manageable number of 2nd-order themes based on the theory-centric information (a process akin to axial coding)	(Gioia et al., 2013) (Strauss, 1998)
	8. Developed the terms, themes, and dimensions into a data structure used for qualitative insights and theoretical simulation modelling	(Gioia et al., 2013)
	9. Translated the dynamics of codes into causal mechanisms through iterative review of the codes	(Eker & Zimmermann, 2016) (Gioia et al., 2013)
Grounded theory articulation	10. Formulated dynamic relationships amongst the 2nd-order concepts in the data structure	(Gioia et al., 2013)
	11. Transformed static data structure into a dynamic, grounded theory model in the qualitative model and a theory simulation model	(Gioia et al., 2013) (Richardson, 2011)
	12. Conducted additional consultations with the literature to refine the articulation of emergent concepts and relationships in the development of a theory simulation model	(Gioia et al., 2013) (de Gooyert & Größler, 2018)
	13. Conducted validity tests to increase the robustness of the simulation model	(Homer, 1996) (Barlas, 1996)

4.3.3 Philosophical positions: Ontological, epistemological, and philosophical perspectives

This section summarises the ontology, epistemology, and philosophical perspectives of approaching the research questions. Ontology concerns questions about what exists and what does not exist. In this research, while the flow of attention is challenging to detect, it is arguably possible to identify patterns and rules in the decision-making process (Abebe, 2012; Shepherd et al., 2017). The flow of attention was detected through meeting observations and a qualitative analysis, requiring the researchers to conduct thorough interpretations. The qualitative analysis focused on the broader organisational factors that influence attentional allocation. The interviews and workshops focused on decision-makers' judgements and interpretations of the environment and experiences. For this reason, constructivism, which is the idea that reality is socially constructed and can be understood via the interpretation of human experience, and positivism, which is the idea that reality is objective and subject to scientific investigation, have both been embraced.

The philosophical perspective encompasses the underlying assumptions and values guiding the research process. This study has adopted positivism, which presumes that research should be objective and value-free, and interpretivism, which maintains that research should be subjective and value-laden and should incorporate the interpretation of human experience. Epistemology concerns the nature of knowledge and the method of acquiring knowledge, often directly impacting the information's reliability and veracity. The interpretive perspective is frequently associated with qualitative research methods, such as interviews, focus groups, and case studies, which allow researchers to explore individuals' and groups' subjective experiences and perspectives. The qualitative analysis generated rich findings regarding fundamental decision-making challenges, which supported further data collection and analysis in this case study.

4.4 Part one of the data collection: Case study

This study includes a two-part data collection process, including a case study of a HA and GMB workshops with two HAs. This section summarises the first part of the data collection case study of an HA.

4.4.1 Case study background

Case studies are commonly used to generate an in-depth understanding of phenomena in a real-life context, particularly regarding 'how' and 'why' questions. By confronting

existing theories and filling in gaps and anomalies in the current theories, new views can be developed and tested to advance the understanding of the phenomenon (Ridder, 2017).

The selected HA is one of the largest HAs in the UK. It owns over 100,000 properties, houses over 300,000 people, and is active in multiple local authorities throughout the UK. The case study HA regeneration team manages several large-scale regeneration projects simultaneously and aims to improve the sustainability and health of occupants through these projects. The HA is also a leading organisation in terms of exploring social value measurements for housing and community projects; it aimed to invest over 100 million GBP in its communities over the next 10 years when the research started. Examples of its sustainability goals include improving energy efficiency, reducing fuel poverty, and expanding charging opportunities for hybrid and electric vehicles on its sites. A critical investment strategy is to increase the proportion of affordable homes (social and affordable rent and low-cost home ownership) within an increasing number of large-scale developments.

4.4.2 Data collection timeline

A rich case study was developed to integrate the various data sources from June 2019 to August 2021. Multiple sources of data covering the case study were collected. The empirical data comprised individual interviews, meeting observations, and relevant documents and files. The data collection started prior to COVID in 2019 and was resumed from September 2020 to November 2021, as Figure 4–1 illustrates[7].

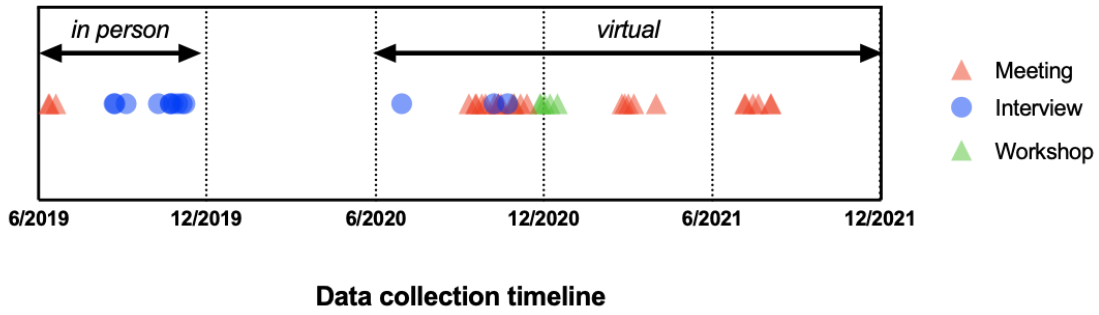

Figure 4–1: Data collection timeline

[7] The data collection during December 2019 to September 2020 was significantly interrupted because of the pandemic COVID-19.

4.4.3 Interviews

The 13 individual interviews were conducted with architects, sustainability consultants, social value specialists, the strategy lead, and regeneration project team members, as Table 4-4 summarises. The interviews covered the following questions:

1) The interviewee's background, including the role at the organisation and involvement in the regeneration projects.
2) The individual's perception of organisational goals and how the organisation makes decisions regarding these issues.
3) The individual's decision-making regarding social mission goals, including how they make decisions regarding specific issues, barriers, and challenges and how they communicate with others.

A detailed list of questions is included in the appendix **A2.1 Interview questions**. The interviewees were selected based on meeting observations and recommendations by the interviewees. The organisational units and roles of the interviewees are outlined in Table 4-4: List of interviewees. Table 4-5 documents the total number of invitations sent and the interview rate. In total, 57% of invitations for interviews were accepted. Each interview typically lasts around 60 to 90 minutes.

Table 4-4: List of interviewees

ID	Organisation unit	Role of the people interviewed
RM1	Regeneration management	Regeneration project manager; leads on the housing regeneration project
RM2	Regeneration management	Senior manager for development; provides development service to the regeneration team
RM3	Regeneration management	Site regeneration manager; managing residential site issues at site
RM4	Regeneration management	Regeneration project manager; leads initiatives in health and sustainability
SR5	Strategy and research	Strategic research manager; leads strategic research and policy team and advises the regeneration project
SR6	Strategy and research	Head of corporate strategy; advises board and provides strategy suggestions
SR7	Strategy and research	Senior manager of strategic research; provides corporate strategy advice to the strategy and research unit
C8	Charity	Social value coordinator; provides social service advice to the regeneration team
C9	Charity	Social value coordinator; provides social service advice to the regeneration team

S10	Sustainability	Sustainability department manager; leads work primarily focusing on environmental sustainability
S11	Sustainability consultant	External consultant; leads discussions regarding the regeneration project's sustainability strategies
D12	Designer	External architect; provides housing design and community consultation event services
D13	Designer	External architect; provides housing design and community engagement event services

Note: Labels in parentheses in quotations indicate the notations in the texts. Each interviewee was assigned a number from 1 to 13 and used a prefix to describe their roles in the regeneration projects. RM represents regeneration management, SR refers to strategy and research, C refers to charity, S refers to sustainability, SC refers to sustainability consultant, and D refers to designer.

Table 4-5: Interviewees' characteristics and response rate summary

Group	Interviewee role	Interviews	Invitations sent	Interview rate
HA regeneration team, *n=5*	Manager	4	8	50%
	Site manager	1	3	33%
HA departments, *n=5*	Policy research	2	2	100%
	Social welfare	1	1	100%
	Strategy	1	1	100%
	Sustainability	1	2	50%
External consultants, *n=3*	Design Architects	2	3	66%
	Sustainability consultant	1	1	100%
	Management consultant	0	2	0%
Total	-	13	23	57%

4.4.4 Meetings and files

In total, 27 meetings, lasting approximately 1,500 minutes, were observed; this included regeneration project meetings throughout planning and delivery stages, policy meetings responding to policy issue consultations, and meetings regarding specific health and sustainability strategies with external consultants. Meetings were used as a space to observe and analyse collective attention allocation. As management tools, meetings are typical places where individuals align their interests and make group decisions. Individuals may notice and interpret cues differently when there are complex institutional rules and different meeting structures. Thus, project meetings allow rich opportunities to

observe the frontline decisions to plan and deliver products or services and to reflect upon strategic decisions.

Table 4-6: Types of meetings observed

Meeting types (n=27)						
Site-based regeneration meetings (n=22, average 55 minutes per meeting)			**Policy meetings** (n=2, average 65 minutes per meeting)		**Other meetings** (n=3, average 70 minutes per meeting)	
Sites	Planning	Delivery		Topics		Topics
A		4	1	Social value consultation	1	Healthy ageing pilot discussion
B		6	1	Planning policy consultation	1	Regeneration projects overview
C	1				1	Sustainability workshop
D	5					
E	3					
F	2					
G	1					

Specifically, 22 site-based regeneration project meetings, which lasted about 1,100 minutes, were collected. The meeting average was 50 minutes per meeting. Site-based regeneration project meetings refer to project meetings that discuss the planning and delivery of regeneration in the seven specific sites where regeneration schemes are executed. The sites are selected because they are the ones the regeneration team worked on. The regeneration project meetings were typically hosted by the HA's manager, who oversees all regeneration meetings. Participants included core members of the regeneration project team and site managers from each regeneration site. Other meeting participants included design architects, management consultants, people from the charity arm, and people from local councils, depending on the stage of the meeting.

Seven regeneration sites that the regeneration team worked on were observed, which provided data for comparisons of meetings held at different regeneration stages. Regeneration projects are frequently multistage operations. In this paper, the planning stage comprises the meetings that occur before the planning application is submitted. The delivery stage includes the post-planning, construction, and handing-over phase. Sites A and B were in the delivery stage, in which existing buildings had been demolished and rebuilding and construction had begun. Sites C to G were in the planning stage, in which

the regeneration team was discussing the design plans. Regarding the scale of regeneration, site A aimed to accommodate approximately 3,000 homes, which is double the original number. The other sites aimed to accommodate between 100 and 400 homes. Four sites were in London, UK, two sites were in the southwest of England, and one site was in east England. As the regeneration team holds national responsibility over sites across the country, there were similar decisions to be made despite the varying locations; thus, the inclusion of multiple sites in the analysis allowed us to identify overall attention allocation patterns.

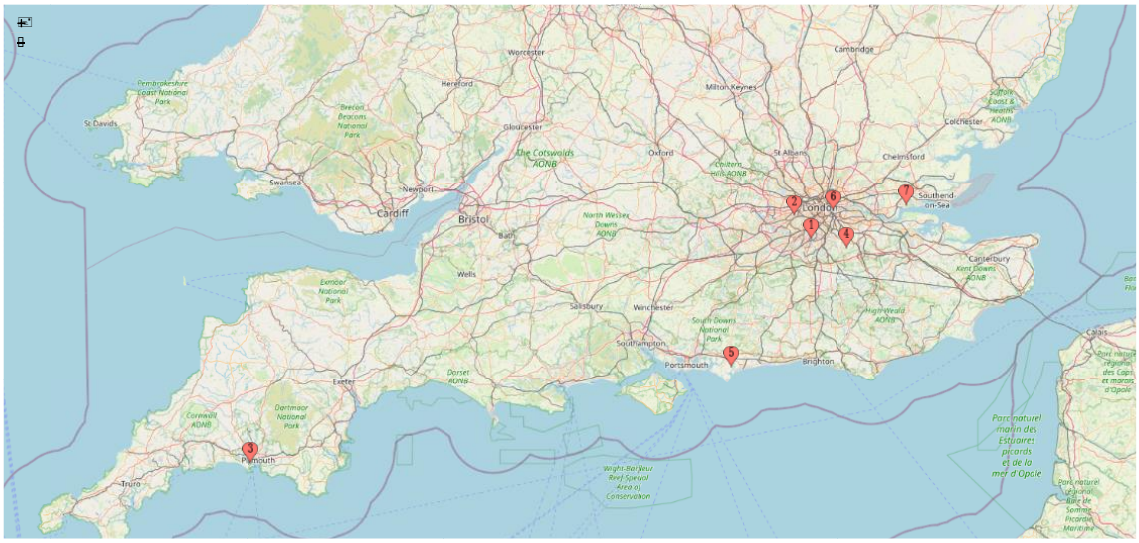

Figure 4–2: Overview of the regeneration sites (marked in red)

Amongst the total 27 meetings, five were policy meetings responding to particular policy issue consultations and other meetings regarding specific healthy and sustainability strategies. Meetings and meeting participants were selected and recruited by the regeneration project manager. Observational goals and ethical information were presented before the recording of each meeting. The initial three meetings were observed in person, while the remaining were all observed virtually; for meetings before COVID-19, the researcher presented in person and recorded the meeting. For meetings after COVID-19, the researcher muted their audio and video and observed the conversations of other meeting participants.

Aside from the meetings, the following four types of documents were included in the analysis:

- The public communication documents which were shared with the public externally, including the social value impact summary and annual resident reports

- The strategic documents aiming to clarify strategies and responses to regulators
- The operational documents, including the meeting minutes and agenda and internal progress reports
- Non-site-specific files from the social housing sector, such as the reviews from National Housing Federation and the Chartered Institute of Housing

Table 4-7 summarises the meetings, documents, and file categories. The documents and files were categorised into the regeneration sites to link them with the meetings.

Table 4-7: Data collection: Meetings and documents

Regeneration sites	Meetings (n=27)	Documents and Files (n=30)		
	Meetings	Operations	Communication	Strategy
Site A (delivery)	4	9	2	
Site B (delivery)	6	3		
Site C (planning)	1	1		
Site D (planning)	5	4		
Site E (planning)	3	0		
Site F (planning)	2	1		
Site G (planning)	1	1		
Non-sites specific	5	1	1	7
Total	27	20	3	7

In summary, 27 meetings were observed, including 22 regeneration team meetings (12 during the planning stage, 10 during the delivery stage), and five non-site-specific meetings (consultation meetings about social value and planning policy and sustainability strategy workshops). Thirteen individual interviews were conducted with architects, sustainability consultants, social value specialists, strategy and policy researchers, and the HA's regeneration project team members. Thirty documents and files were collected, including operations files (meeting minutes, presentations, internal actions), public communication files, and additional files concerning non-site-specific strategies.

4.5 Part-one data analysis overview

This section outlines the rationales behind analysing the case study HA's data in each step, providing an overview of the data analysis. The detailed results of data analyses are provided in CHAPTER 5 and CHAPTER 7.

4.5.1 Step 1: Qualitative analysis

The qualitative analysis was performed in ATLAS.ti software to code interviews, meetings, and all documents. The aim is to understand concepts relevant to the dynamics of HA's decision-making in regeneration. All transcripts and recordings were imported to ATLAS.ti software for the qualitative analysis. Grounded theory was used to develop theoretical concepts and relationships through coding (Charmaz, 2006; Gioia et al., 2013; Strauss & Corbin, 1994). Coding captures the meaning of segments of data. At the cognitive level, it can capture the process of attention allocation. Secondly, at the group dynamics level, it concerns the factors that influence decision-making, such as the overarching field and organisational factors that contribute to the dynamics.

The analytical step generated two outputs: (1) the identification of the decision topics, which allowed for the identification of change-over-time patterns of attention in regeneration project meetings; and (2) qualitative reflections and insights regarding the main concepts, which were developed into a CLD. The detailed codes are provided in CHAPTER 5.

4.5.2 Step 2: Change-over-time patterns

By identifying change-over-time patterns, the aim is to understand the issues that were focused on throughout the meeting time and the transitions between the different topics. Rather than analysing all 27 meetings, the 22 regeneration project meetings were used to identify the attention patterns, as they are the typical decision-making contexts of regeneration decisions.

The minute-by-minute analysis of groups' decision-making was used in previous management studies (Poole & Roth, 1989). According to Poole and Roth (1989), 'findings on the limits of human cognitive capacities suggest that if the goal is to map actors' responses to others' acts in immediate interaction, the unit of aggregation should be a few minutes at most'. Coding in minute- long segments can also help capture the cognitive-level dynamics from a systems perspective (Rudolph & Morrison, 2008). The overall attention allocation was captured based on the number of codes. Coding examples are provided in Appendix **A2.2 Meeting coding examples**. Specifically, two key elements are involved in generating the attentional patterns:

- **Co-occurrence table.** Initially, the absolute number of codes of each topic that appeared every 30 s were counted, generating a co-occurrence table, through which

attention fraction data points for each decision category were extracted. To indicate the general pattern of attention allocation in meetings, the co-occurrence of codes with time segments of 10 minutes (20 x 30 s segments) was examined.

- **Attention fraction.** The co-occurrence table was translated into changes in the attention fraction, which was used as a proxy notion to calculate the relative proportion of attention within each 10-minute segment. See the illustration of calculating the attention fraction in Table 4-8.

Table 4-8: Illustration of calculating attention fraction

Time segments	**Topic A**		**Topic B**	
	Number of codes of B	Attention fraction of A	Number of codes of B	Attention fraction of B
0~10 min	a1	$a1/(a1+b1)$	b1	$b1/(a1+b1)$
10~20 min	a2	$a2/(a2+b2)$	b2	$b2/(a2+b2)$

Counting within each time segment minimised the potential distortion of the attention percentage resulting from the code frequencies, which differed excessively across time segments. For example, the frequencies of the total counts of co-occurrence in the initial few time segments were sometimes substantially higher than the total instances of co-occurrence in the last few time segments, as people could end the meeting with topics irrelevant to the regeneration topics. Using relative fractions within each time segment ensured a more accurate representation of the attention fractions than the total relevant information density. The elicitation of change-over-time patterns allowed us to understand the crucial tensions within both the planning and delivery regeneration stages. The detailed results are provided in CHAPTER 5.

4.5.3 Step 3: Causal loop diagram

From a systems perspective, complexity encompasses the following three dimensions: the number of relevant elements, the number of connections between elements, and the functional intricacies of the connections between elements (Größler, 2004). CLDs are diagramming tools that demonstrate how system components are related in their endogenous ways (Sterman, 2000). CLDs (Richardson, 1986) were used to map the

connections between codes and concepts across decision-making (intangible) and urban regeneration systems (tangible) systems.

CLDs indicate a system's critical causal mechanisms, and loops describe endogenous causal mechanisms (Sterman, 2000). CLDs were used to extract dynamic relationships, allowing us to identify the reinforcing and balancing dynamics, with the aim of providing dynamic explanations of the change-over-time patterns regarding decision issues. From CLDs, reinforcing loops (circular mechanisms that amplify the changes imposed on the system, whatever the direction of change) and balancing loops (circular mechanisms that stabilise the direction of change) were identified. Identifying loops allowed us to provide dynamic explanations of the change-over-time patterns of topics requiring decisions and to understand the impact of the decision dynamics on urban regeneration outcomes. The detailed results are provided in CHAPTER 5.

In the following sections when report CLD results, A positive (+) sign implies positive causality, meaning that an increase (decrease) in the cause variable will result in an increase (decrease) in the ends variables if everything else stays the same. A negative (-) sign implies negative causality, meaning that an increase (decrease) in the cause variable will result in a decrease (increase) in the ends variables if everything else stays the same. 'R' represents 'reinforcing' loops, meaning that an increase (decrease) of one variable would increase(decrease) the variable itself after travelling the full loop. 'B' represents 'balancing loops, meaning that an increase (decrease) of one variable would decrease (increase) the variable itself after travelling the full loop. As illustrated in Figure 4–3, the increase in chicken increases egg, which increases chicken, creating a reinforcing loop (marked as 'R'). The increase in coffee increases energy, which decreases coffee intake, creating a balancing loop (marked as 'B').

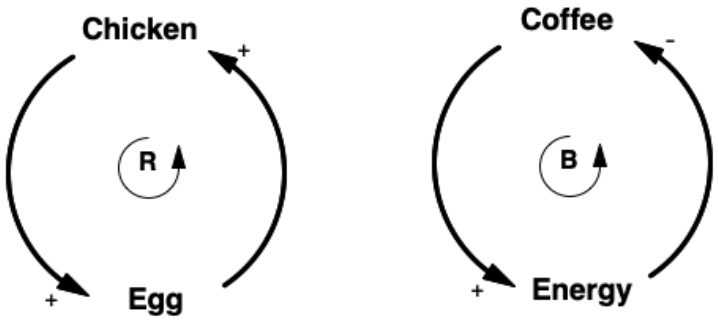

Figure 4–3: Illustrations of reinforcing and balancing loops

4.5.4 Step 4: Theoretical model simulation

SD modelling is a methodology that explores the complexity of circular causality or feedback loops and how interactions between factors can result in non-linear behaviours in the systems (Sterman, 2000). It can be applied to generate robust policies regarding specific real-world issues such as public health, climate and environmental issues (Fiddaman, 2002), and operational and managerial issues (Jalali et al., 2017). It is also widely used to inform theory building and testing (de Gooyert, 2019), especially in the context of organisational and management theories (Rudolph et al., 2009).

Though the simulation model has been developed based on insights from the qualitative CLD, the simulation aims to be a theoretical rather than applied model. Thus, while the segments of change-over-time behaviours were extracted and analysed to generate small models, the model has not been calibrated on empirical data. However, theory-based modelling focuses on generalisability and on providing incremental knowledge to explain and theorise a phenomenon without the absolute need to collect empirical data regarding a specific instance (Schwaninger & Grösser, 2008) The detailed results are provided in CHAPTER 7.

4.6 Part-two data collection overview: Group model-building workshops

This study includes a two-part data collection process. The GMB workshops, yielding the second portion of the data, investigate the role of policies in decision-making within regeneration projects and how systems thinking and organisational decision-making can be incorporated into policy design regarding complex policy issues.

A series of GMB workshop sessions included another large UK HA in the virtual participatory workshop during November and December 2020. In addition to the primary case study's HA, another regeneration team from the second HA was included to improve the diversity of participants in the workshops. Both HAs manage large-scale regeneration projects in London and other parts of the UK.

The workshop engaged with key stakeholders through a sequence of sessions with pre-defined scripts to examine stakeholders' understandings of the system's causal links based on their mental models (Doyle & Ford, 1998). The main output of GMB workshops is frequently a set of CLDs.

Due to the outbreak of COVID-19 and work-from-home restrictions, all sessions were conducted virtually through Micosoft Teams. All sessions were video-recorded. In total,

seven participants were involved. Although no recommended sample size is specified in the literature, small groups are suitable for online workshops to generate fruitful conversations and to capture different views, as they provide every participant with abundant opportunities to disagree and discuss the topics (Eker et al., 2018; Fowler et al., 2019).

4.7 Summary of the methodology

Overall, qualitative coding, change-over-time patterns, and SD tools (CLDs, simulation models, and GMB workshops) that focus on the interconnections and complexities between system components have been used. The aim is to explore how different parts of the system influence each other, and how they contribute to the overall functioning and behaviour of the system. The focus on interconnections helps to identify the events' origins and to develop solutions that address the underlying issues rather than merely the symptoms.

Figure 4–4 illustrates the steps involved in the data analysis in relation to the data input and findings. In summary, the following apply to the case study HA, which is the subject of the left two parts of Figure 4–4:

- Firstly, a grounded theory-based qualitative analysis was conducted in ATLAS.ti software to code the interview data. The codes generated key decision topics, dimensions, and insights into main themes.
- Secondly, the change-over-time dynamics were elicited based on the critical decision topics generated from the first step. The aim of this step was to extract ‘attention patterns' that describe how decision-makers’ attention was allocated across project stages.
- Thirdly, CLDs were used to map the causal pathways of codes and concepts. This step aims to generate structural-level dynamics that explain behaviours from the second step. Iteratively reviewing the CLDs contributed to the formation of a systems model of attentional dynamics in hybrid situations. The results of the qualitative CLD, illustrating the regeneration programme-level complexity, is presented in CHAPTER 5.
- Fourthly, based on the previous steps' structural and behavioural dynamics, the fundamental problem of attention allocation was identified. By further drawing

from theoretical perspectives (see CHAPTER 6), a simulation model was developed and presented in CHAPTER 7. These two chapters focus on the micro-level dynamics of attention allocation.

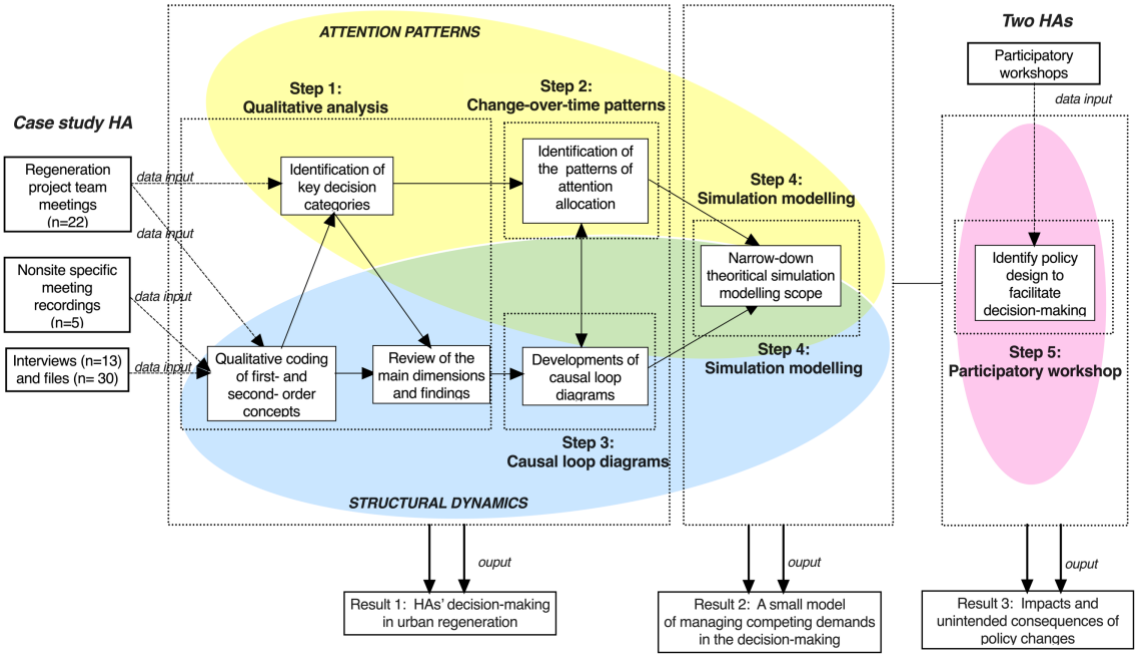

Figure 4–4: Methods summary

The right side of Figure 4–4 presents the GMB with two HAs. Firstly, a systems approach to policy design was proposed. The causal mechanisms from the CLD generated from the workshop were then used to inform the systems-based policy design. CHAPTER 8 describes the workshop methods in greater detail.

CHAPTER 5

Dynamics of the housing association's decision-making regarding regeneration

5.1 Introduction

This chapter presents the first portion of the findings, specifically concerning the dynamics of the case study HA's decision-making in urban regeneration. This chapter aims to understand (1) the changes in attention patterns in response to various demands in urban regeneration and (2) the underlying causal feedback mechanisms contributing to the dynamics of attention patterns and their connections with sustainability and well-being implications. Through the analysis of the HA in the case study, the patterns of attention allocation in urban regeneration projects were identified, and a CLD describing the dynamics of the HA's decision-making in urban regeneration was developed to explain the changes in the attention patterns.

This chapter is organised as follows. First, a summary of the methods is presented. The findings are presented in the following sequence: a thick description of the main types of topics requiring decisions, the patterns of attention allocation in regeneration team meetings, and the CLD that conceptualises why the focus of attention changes over time. Finally, the discussion and contributions are presented.

5.2 Methods

The basis behind the methods was outlined in CHAPTER 4, specifically in sections 4.3.3 and 4.5. In summary, from 2019 to 2021, 27 meetings within the case study HA were observed, including 22 regeneration team meetings (12 at the planning stage and 10 at the delivery stage) and five non-site-specific meetings (consultation meetings about social value, planning policy, and sustainability strategy workshops). Thirteen individual interviews were conducted with architects, sustainability consultants, social value specialists, strategy and policy researchers, and the HA's regeneration project team members. Thirty documents and files were collected, including operations (meeting minutes, presentations, and internal actions), public communications, and additional files regarding non-site-specific strategies.

Figure 5–1 highlights the three steps of data analysis applied to this chapter. The data analysis integrated the change-over-time analysis into the qualitative analysis and CLDs. The qualitative analysis and change-over-time patterns indicated the attention patterns, and the CLDs were developed to explain the structural dynamics.

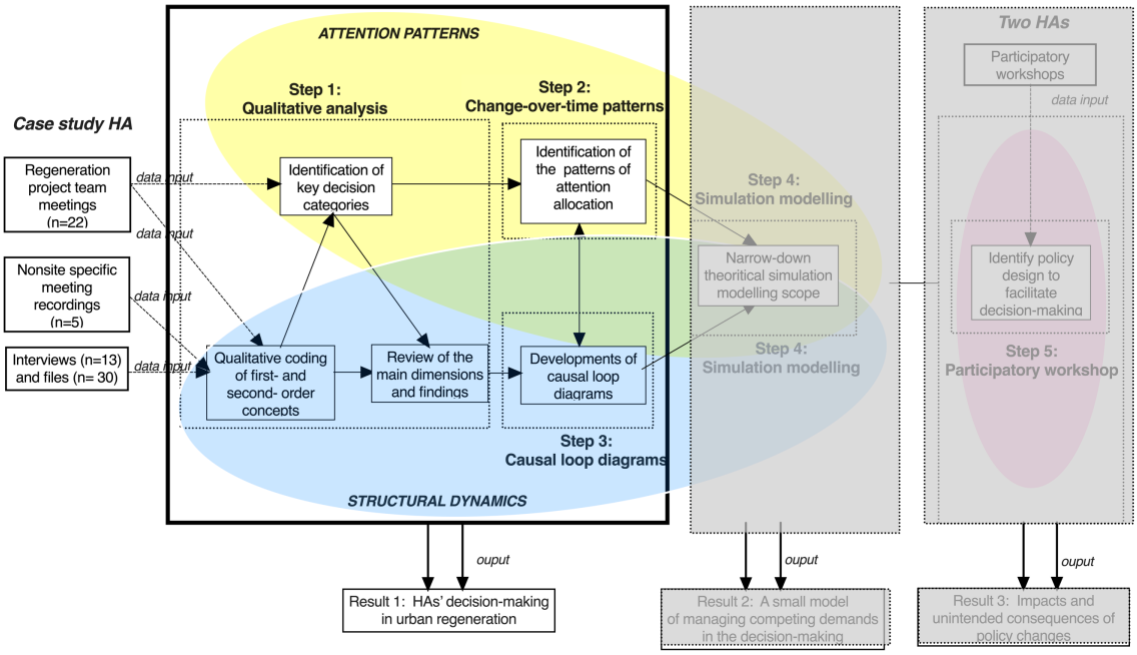

Figure 5–1: Version of Figure 4–4 highlighting the first portion of the findings' methods and steps

Specifically, the data were analysed in following steps. Firstly, a qualitative analysis was performed to capture the main concepts iteratively. The established theoretical concepts of bounded rationality (Simon, 1957) and ABV in decision-making (Ocasio, 1997) were used to inform the qualitative coding. The initial coding was based on multiple rounds of open coding to uncover the main categories of topics requiring decisions, their connections, and the decision process in attention allocation. Additionally, focus types that indicate attentional problems and attention triggers were amongst the emerging code categories. Specifically, attention refers to the focus of discussions during the meeting, such as attention to the project's progress or attention to community engagement. Triggers of focus indicate what stimulated discussions. The coding was reviewed iteratively and produced a list of first-order codes about topics requiring decisions and elements influencing the decision-making process.

The coding results are presented in Figure 5–2. Amongst the second-order themes, there are:

- (1) Seven types of topics requiring decisions (health and well-being, environmental sustainability, community engagement, housing design, policy compliance, operational management, and financial viability and efficiency) and
- (2) Three elements that influence decision-making processes (managing goals, powerful stimuli, and organisational learning).

After referring to the theory of organisational attention and institutional hybridity, four aggregated dimensions were identified: attention to social mission logic, attention to project management, attention to market logic, and decision-making processes.

As illustrated in Figure 5–1, the second step was intended to elicit attentional patterns. Meetings observed at each regeneration site were coded into segments of 30 seconds to fulfil the aim. Co-occurrence tables were used to generate attention patterns (see the rationales and steps in section 4.5.2). Specifically, each regeneration project meeting extracted the number of codes of each decision issue category (environmental sustainability, health and wellbeing, community engagement, housing design, policy compliance, operational management, and financial viability and efficiency). The 'attention fraction' was created to represent the portion of attention devoted to a specific category of issues within the total attention. Example quotations of the seven types of topics and their co-occurrence tables are included in appendix A3.1 Quotes of the seven types of topics requiring decisions and A3.2 Code-occurrence data.

Finally, the CLDs were grounded from the qualitative analysis and aimed to explain the attention pattern, exploring how system's structures contribute to the changes of focus in attention allocation.

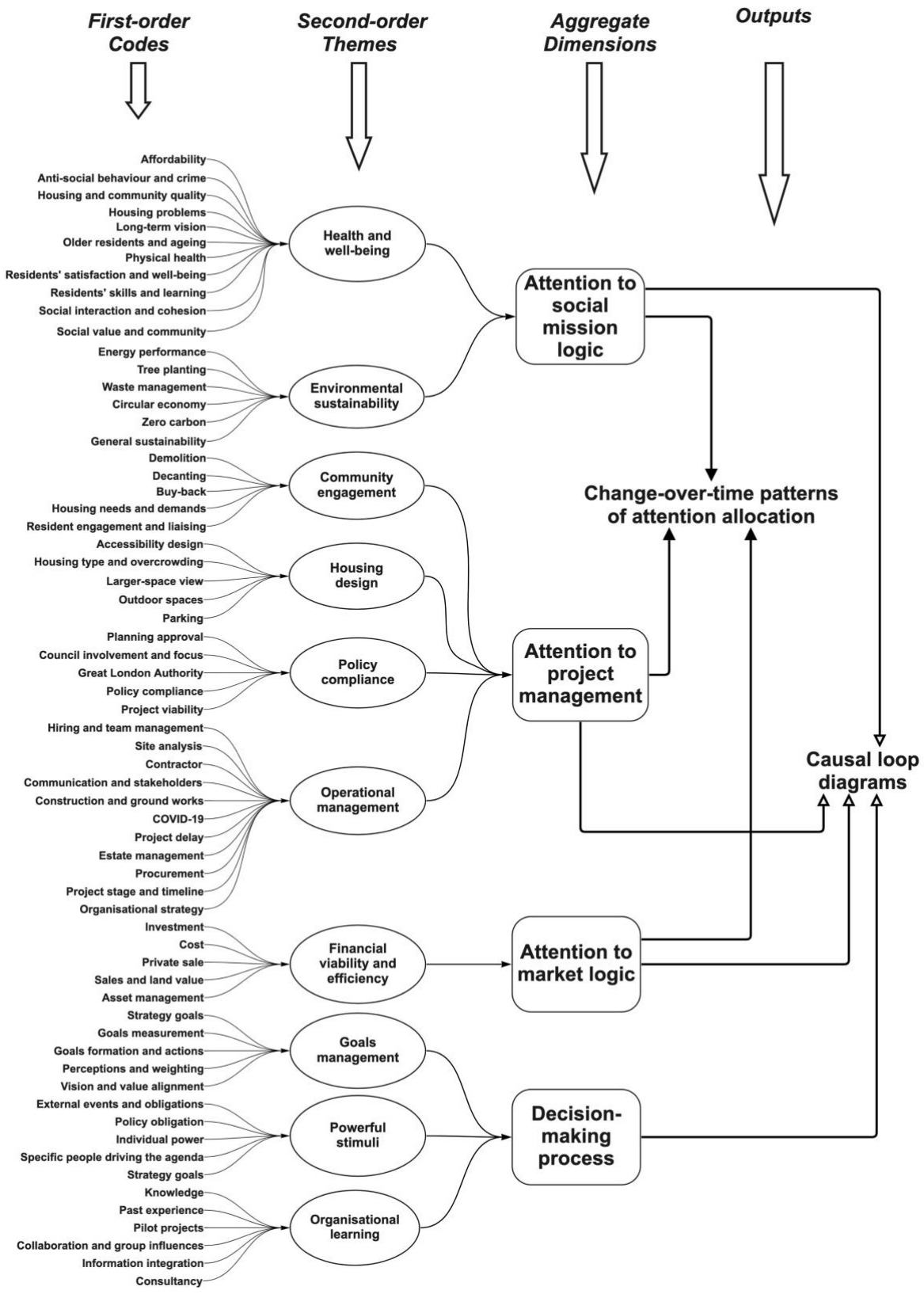

Figure 5–2: Qualitative coding

5.3 Seven types of topics require decision-making

Seven categories of topics that require decisions emerged from the qualitative analysis (see Table 5-1 for the definitions). Health and well-being and environmental sustainability directly reflect the HA's social mission logic, as they represent broader societal challenges that regeneration projects can potentially address. Financial viability and efficiency represent decision-makers' considerations of the financial benefits and value of regeneration projects, which reflect the market logic. Community engagement, housing design, policy compliance, and operational management are topics that correspond to broader considerations related to the successful delivery of the regeneration project. Example quotes for the seven types of topics are included in the appendix **A3.1 Quotes of the seven types of topics requiring decisions**

Table 5-1: Repertoire of seven types of topics requiring decisions and their definitions

Topic requiring decisions	Definition
Environmental sustainability	Environmental impacts on nature from regenerating the area, including demolition, decanting, rebuilding activities, and neighbourhood sustainability topics, such as green spaces, tree planting, and energy efficiency.
Health and well-being	Housing and neighbourhood quality's influence on residents' physical health, mental health, and well-being and broader topics that focus on affordability, social connection and cohesion, deprivation, crime, and antisocial behaviours.
Community engagement	Community and resident housing needs and engagement with residents throughout the regeneration project's demolition, decanting, and rebuilding process.
Housing design	Design topics relevant to the housing layout, mixture, density, and spaces in the surrounding areas.
Policy compliance	National and local government policies and regulations regarding regeneration projects.
Operational management	Managing human resources, communication, procurement and contracting site appraisal and analysis, and project timeline and stages.
Financial viability and efficiency	Considerations of costs, development value, and financial risks throughout the regeneration project. Evaluation of regeneration viability based on the economic value.

5.3.1 Environmental sustainability

Based on the interviews, it has been widely recognised in the team that regeneration projects have high ambitions in terms of sustainability goals. Sustainability goals were described as ‘sustainable places, rather than just housing’ and ‘buildable and more efficient and a better residential scheme’, relating the decision-makers’ recognition that sustainability encompasses not only environmental aspects but also interconnections between people and nature. Within the regeneration team, the project lead established clear goals regarding sustainability issues by introducing the idea of a circular economy strategy to the team. The architect (D12) also stated that the circular economy strategy is a relatively ‘new idea’. While the team was pushing for sustainability strategies, they also agreed that delivering the ideas is financially and technically challenging. Circular economy characteristics such as on-site recycling, zero-carbon, home alliances such as new boilers in the new home, green spaces, and tree planting were also mentioned in relation to environmental sustainability.

Developing measurable goals is crucial to guide daily decision-making regarding environmental issues, as ‘what we measure is very tied to what we can deliver’ (RM4, 2020). However, measurements of sustainability issues were described as a gap. For example, one interviewee explained that the measurement gaps can result from the human resources gap, as there are no sustainability teams in the organisations. The merger event was described as a challenge to clarify the direction of environmental sustainability issues, as there are continuous changes with new strategic directions, implying further delays in explaining the directions. On the other hand, the loose or broad definitions of sustainability allow opportunities to pilot projects. For example, the circular economy strategy was introduced by the project lead. The sustainability consultant explained that demonstrating how environmental sustainability issues impacts residents' health or multifarious benefits can facilitate decision-making. For example, the installation of high-performance windows was described as not being a difficult decision ‘because the performance of the glass is better, so you can get more light. It means they save energy, it means they are better acoustically’ (S11, 2019).

5.3.2 Health and well-being

Housing and neighbourhood quality were widely mentioned as catalysts for initiating regeneration projects. This is because decision-makers perceive poor housing conditions as decreasing residents’ health and well-being. ‘It is about the people and the

environment', as the interviewee expressed. The organisational housing standards were frequently mentioned during meetings, as they determined investments to upgrade the HA's housing properties, such as upgrading heating systems, roofs, kitchens, and bathrooms. For properties in poor conditions, the regeneration team explored options to refurbish or regenerate depending on how large the deficit per unit would be and whether the project would be approved.

Specific health and well-being issues were mentioned, such as physical health, children, and ageing people's needs. Ageing and older people's strategies were frequently mentioned during interviews. As noted by one interviewee, 'these older persons' housing units are generally in a relatively poor state', and the targeted health outcome is driven by the organisation-level strategies (SR7, 2019). Broader issues such as affordability, social value, social connection and cohesion, deprivation, crime, and anti-social behaviours were frequently mentioned in the interviews. For example, fuel poverty was linked with residents' health, work performance, and poverty. The interviewee explained that the regeneration team attempts to develop 'place-based' approaches to maximise the regeneration scheme's outcomes.

Providing affordable housing and ensuring policies' compliance with affordable housing were frequently mentioned in interviews and meetings. Private housing provision was viewed as an approach to 'cross-subsidise the affordable' (RM2, 2019). Affordable housing in the regeneration projects context includes two types of tenures: social rented and shared ownership. According to the interviewees, affordable housing typically comprises 35 to 50% of the total new homes; within that, there is generally a 60-40 ratio of social rented housing as opposed to shared ownership. Meeting the local council's affordable housing thresholds was a key criterion in evaluating the viability of the regeneration project. According to one regeneration manager, 'basically the council is making sure you are not building homes for profit, but you are building some affordable homes'. A common challenge involved in regeneration is that residents from previously socially rented properties move away before the new homes are built, since 'most regeneration projects take so long', or the scheme ends with fewer socially rented properties. According to the project lead, the regeneration team aims to support everyone to stay and build more socially rented homes than they started with while increasing the density of houses.

5.3.3 Community engagement

Community engagement is pivotal, as it determines whether the community and the HA reach an agreement to start regeneration projects, which essentially dictates the viability of the regeneration project. ‘Community buy-in’, ‘residents' support’, and ‘residents’ agreement’ were described as essential elements to have a project approved. At the planning stage, the engagement activities include exploring the housing tenures and demands and the possibilities for the HA to buy back properties to exert control over the estate. Community engagement is critical to informing issues relevant to health and well-being. The early conversations in meetings frequently include identifying the number of socially rented homes if these residents plan to return and if the residents need two bedrooms or properties such as three-bedroom homes to address the overcrowding problems.

Consequently, regarding housing demands in the local planning context, residents' housing demands and affordability issues are often mentioned together. As the estate managers described, surveys, individual conversations, and public consultation events were used to understand residents’ visions of regeneration projects. This form of engagement informs the architects to include flexible or adaptable kitchens.

Site management at estates directly influences residents’ engagement. As regeneration frequently requires lengthy periods of time, the project included the demolition and rebuilding process, during which the residents might temporarily move away to another property or permanently leave the community. According to interviewees, demolition and decanting take long, as ‘moving people and find them homes, it does take long’ (RM1, 2021). Costs relevant to providing social housing for residents who decide to return are frequently considered and modelled, as they influence the projected available number of homes for sale. During the early-stage meetings discussing the potential for regeneration, decision-makers clearly stated that regeneration could be ‘significantly disruptive’ to the community and its people. Thus, community engagement is a primary activity, especially in the early stage of regeneration. The interviewees also expressed that the regeneration projects were designed to encourage residents to stay to minimise the disruptions to people’s lives. For example, the regeneration team communicated with freeholders, leaseholders, and homeowners using residential offers and explained residents' various options. Consequently, the regeneration meetings frequently include estate managers who will report on the residents' engagement events and issues raised by residents.

5.3.4 Housing design

Policy changes related to homes and neighbourhood design represent one challenge which is potentially relevant to the time required for the project to be approved. Design issues are frequently linked to local standards or requirements related to the parking, housing mix, density, and spaces in the surrounding areas, ensuring that they are 'in line with the local authority parking requirements'. The volume of affordable housing is critical for design conversations, as it influences the housing layout, which indicates that regeneration projects are potentially more vulnerable to planning and design code changes. Architects described those changes to the master plan as a more significant challenge, as design elements must be re-submitted with amended features, which can result in delays in delivering the project.

Housing and neighbourhood design are also linked with housing needs. For example, overcrowding was mentioned as an outcome of regeneration, as the homes will be designed to suit people's needs. Additionally, according to the architect, the design of housing accessibility should account for residents' 'lifestyle' rather than merely the requirements of building regulations. One of the approaches to reducing the overcrowding issue is to increase the number of usable outdoor spaces by providing everyone with a private balcony and increasing access to neighbourhood parks and facilities. Parking facilities and access to buses were closely associated with meeting the local standards related to the environment and pollution. During meetings, when reviewing the design options, people frequently mentioned the public realms in the neighbourhood.

5.3.5 Policy compliance

As the interviewees suggested, policy compliance with building regulations is critical, as it determines whether the regeneration project can be approved. Specifically, local authorities' policies around parking requirements, building heights, housing mix, and greenspace ownership were frequently mentioned in the meetings. The sustainability policies influence design decisions, such as including energy centres in the master plan and replacing gas combined heat and power (CHPs) with air-source heat pumps. Sustainability goals were described as stringent; thus, achieving policy compliance is challenging and difficult to transcend.

In the early-stage regeneration team meetings, attention to social value conversations predominantly focuses on the number of affordable homes. Social value policies were

mentioned as lacking transparency and clarity in local authorities. For sites in the early appraisal stages, the regeneration team's responsibility is to explore the feasibility of the demolition and the development's feasibility after demolition. The early-stage conversation's goal is to ensure the project viability. Early discussions also involve possible options related to housing density and green space planning. When the local council owns the parking space, decisions regarding parking types and locations are then constrained by the local plans and interests. This also involves considering the engagement relationship with local authorities or councils and approaches to 'get councils on board'. For example, in one of the meetings, the council was described as 'very helpful and very engaged' (site E). The goal of the early decisions is to establish the development agreement; the council staff will frequently be included in the monthly meetings to get updates on the project's progress. As the regeneration project continues, the charity arm can establish partnerships with the local council. For example, in one of the regeneration projects, the charity arm partners with the council employment to provide employment training.

5.3.6 Operational management

Operational management issues refer to managing human resources and the operational level of project management. Human resources and team management include hiring, communications, and stakeholder management. The project management issues include site appraisals, surveys, contracting and procurement, and managing the project timeline, such as monitoring the delays and critical timing within the project.

Interviewees noted that the investment committee's decisions, especially the ones relevant to sustainability issues, are important because they are part of the 'formalised process around what level of investment you put into things'. The organisational housing quality standard was frequently mentioned in regeneration meetings, indicating the significance of operational guidance documentation. Furthermore, interviewees expressed that for sustainability issues, 'unless you are very clear about "this is a corporate strategy," it just won't be a corporate priority'.

5.3.7 Financial viability and efficiency

Though the HAs are not profitable organisations, due to the changes in government funding, HAs must depend on their revenues to invest heavily in development projects. Thus, financial viability and efficiency issues that mainly consider costs and revenues are frequently mentioned. Building costs include all the costs of the development projects

throughout the planning, demolition, and construction stages. The sales values are financial returns from socially rented and private sales. In early-stage meetings, the team discusses the comparison between building costs and development sales. Decisions regarding housing tenures (social ownership, social rented and private sale) thus highly influence the projected financial returns, being a focus of discussion in financial modelling, and particularly during early discussions.

As described in one of the meetings, the private sale can 'offset some of the lower (housing) values, especially in the shared ownership units' (Site C, 2020). During regeneration, the HA will need to provide housing to residents who will return. The HA must pay the home-loss payment for residents who decide not to return. The cost calculation topics were also observed in the meetings. Interestingly, the increases in assets do not necessarily increase the financial resources. Interviewees indicated that as housing assets increase, there are an increasing number of local authorities with different priorities that need to be worked with. As the local authorities regulate HAs, aligning preferences becomes critical for fulfilling local needs.

5.4 Change-over-time patterns of attention

This section summarises the attentional patterns observed within urban regeneration meetings.

5.4.1 An overview of attentional patterns

Figure 5–3 describes the changes regarding attention patterns within regeneration meetings every 10 minutes. Regarding the social mission logic (see upper left of Figure 5–3), decision-makers devoted greater attention to health and well-being topics in planning-stage project meetings compared to delivery-stage project meetings. For environmental topics, sustainability was not solely focused on environmental aspects but also encompassed interconnections between people and nature. However, attention to sustainability topics remained comparatively limited throughout the meetings. In comparison, the attention to the market logic remained comparatively high throughout both the planning and delivery stages[8] (see bottom left of Figure 5–3). The code-occurrence tables are included in appendix **A3.2 Code-occurrence data.**

For regeneration project delivery activities, as the right side of Figure 5–3 illustrates, attention to community engagement tended to exhibit a similar pattern relative to attention

[8] The description of the planning and delivery stage can be found in Section 4.4 of the methods chapter.

to housing design in the planning stage, as the engagement serves to inform the architects of the housing design. While attention to policy compliance in the planning stage exhibited an up-and-down pattern, it remained stable in the delivery stage. In addition, operational management dominated in the delivery stage of regeneration.

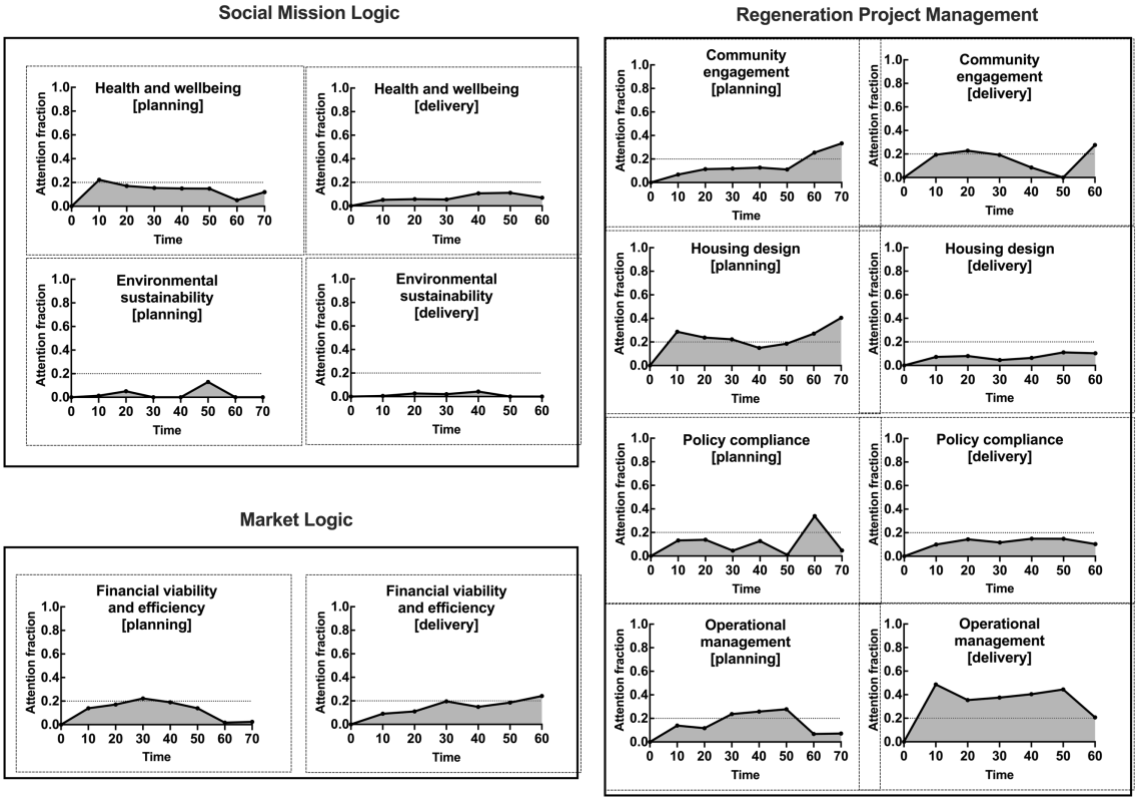

Figure 5–3: Change-over-time plots of attentional patterns in the planning (n=12) versus delivery stage (n=10) of regeneration team meetings.

5.4.2 Attention allocation comparison between project stages

A further comparison of the attention to the social mission logic, market logic, and project management reveals that the attention to social mission logic dominates over market logic in the planning stage of regeneration meetings, despite the shifts in attention during the 20-40 minutes, as the left side of Figure 5–4 demonstrates. In comparison, the social mission logic did not dominate at the delivery stage of regeneration meetings even though there are moments of increasing of it, as the right side of Figure 5–4 reveals.

Overall, the attention to social mission logic dominated over market logic in the planning stage of regeneration meetings. In comparison, the social mission logic did not dominate in the delivery stage of regeneration meetings, although there were moments in which it

increased. Meetings in the delivery stage exhibited a strong problem-solving mode in which the majority of the attention was dedicated to project delivery activities.

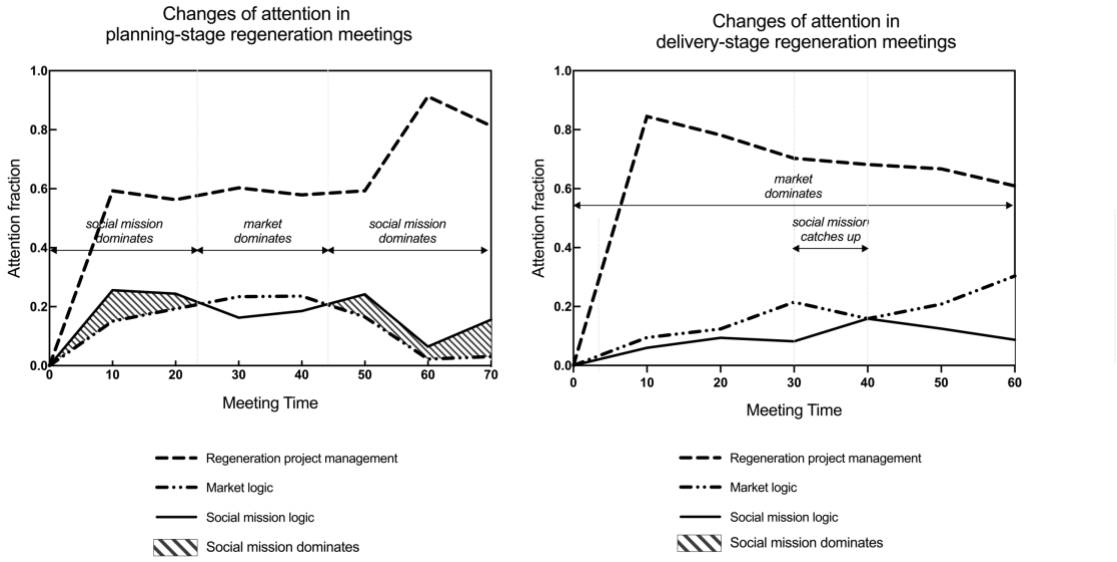

Figure 5–4: Aggregated view of the change-over-time attention patterns that focuses on the planning (n=10) versus delivery stage (n=12) of regeneration team meetings. Note: The time range when attention to the social mission logic surpasses attention to the market logic is highlighted using grey areas.

5.5 Tensions and complexities regarding decision-making

Tensions influence the dynamics of decision-making rules in relation to decision issues and the complexities of decision-making rules. This section presents the main concepts contributing to the dynamics of decision-making in urban regeneration projects, seeking to explain the change-over-time patterns of attention described above. Figure 5–5 summarises the concepts, which are described in greater depth in the following sub-sections.

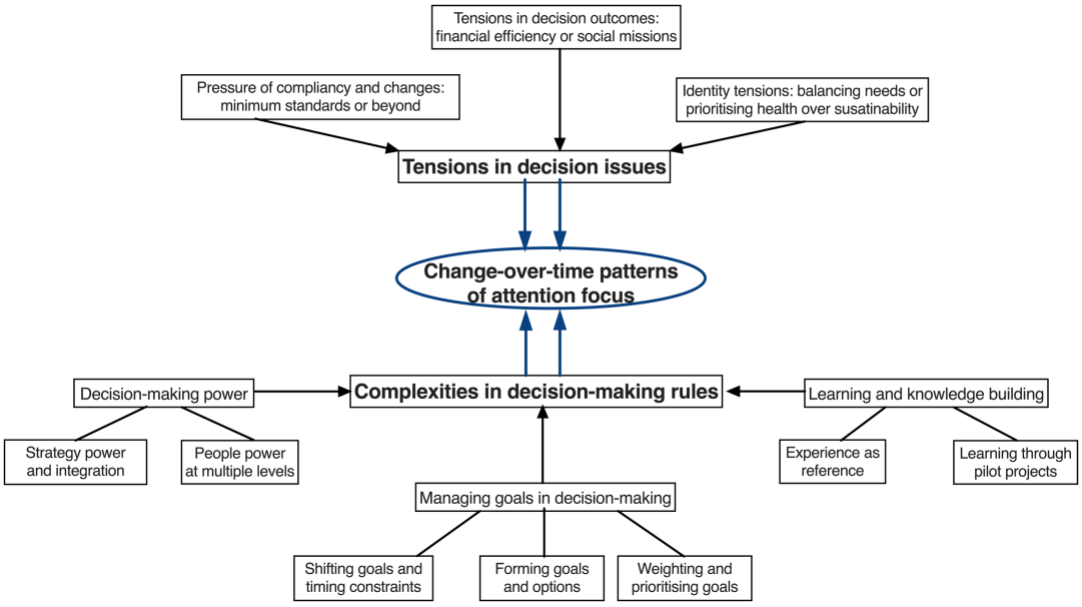

Figure 5–5: Main concepts relevant to the change-over-time within attentional focus

5.5.1 Tensions in decision-making

5.5.1.1 Tensions in decision outcomes: Financial efficiency or social missions

Interviewees expressed that the continuous decrease in government funding goals the HA to consider the financial efficiency of projects. Consequently, financial viability and efficiency are critical, as the HA relies on the development value to subsidise the regeneration project and broader health and wellbeing goals. The costs over time were used as a critical criterion to appraise the decision options. Building costs include the costs of demolition and rebuilding, the loss of rent, and operational costs throughout the project. The development value describes the rent and sales value. ‘Deficit per unit’, which represents the difference between building costs and development values, was mentioned frequently during the meetings.

On the other hand, decision-makers clearly stated that urban regeneration is complex and exhibited continuous attempts to address multiple social facets, such as residents’ employment and quality of life throughout the regeneration project. However, the trade-off between building financial efficiency and delivering health and sustainability at a scale was suggested as the main challenge. Decision-making was described as ‘finding a balance’ between financial costs and outcomes to achieve satisfying results.

5.5.1.2 Pressures of compliance and changes: Minimum standards or beyond

National and local planning regulations determine the minimum standards the HA must adhere to in regeneration projects. According to the architects, meeting the minimum

policy standards in building performance is challenging. The architect noted that ‘the London planning policy is tough on energy, carbon and materials’. Thus, although sustainability is included in the design, such as improving fabric and ventilation and using PVs throughout the roofs, the compensation of CO^2 is still necessary to achieve policy compliance.

The impact of policies and regulations on decision-making was also observed in meetings. In early-stage regeneration meetings policy compliance requirements regarding regeneration were frequently mentioned, which directly influenced decisions related to affordable housing, parking, and green spaces. Consequently, decision-makers often focuses on policy compliance and changes in policies and regulations. Interviewees mentioned that the decline in government funding is one of the main policy changes in the past decade. Given the ‘external pressure’ of relatively low grant availability, HAs increasingly use institutional funding or bonds raised on the market. Thus, HAs also need to focus on funding requirements. As one interviewee expressed, environmental social governance (ESG), as an ethical investment, required the HA to develop measurable health and sustainability outcome-related goals. According to the HA's ESG report, in 2019 and 2020, about 80% of the newly built homes achieved a minimum energy performance certificate (EPC) B standard. Warmer and sustainable homes, green spaces, and biodiversity were included as strategic goals for sustainable development. In 2021, measurable goals for climate change, ecology, and resource management were developed.

Furthermore, the frequency of external and organisational changes appears to cause challenges related to decision-making. Changes in planning policies that aim to increase the delivery could favour sustainable or healthy housing, as the regeneration project's viability is strongly dependent upon policy compliance. However, changes in funding, policies, and project delays increase decision-makers' attention to monitoring or forecasting planning standards and considering the implications on project viability, resulting in increased attention to financial viability and efficiency. The architects posited that the external planning guidelines are changing too quickly, ‘almost on a yearly basis’. External crises or events also appear to push the HA to make decisions according to the changes. For example, one interviewee explained that when the large fire in the Grenfell social housing tower occurred, HAs focused on issues relevant to building fire safety. One interviewee described the HA as a ‘very operational, reactive, responsive

organisation', highlighting the high frequency of changes that the regeneration team and the organisation face.

5.5.1.3 Identity tensions: Balancing needs or prioritising health over sustainability

Another challenge is the tension between health and well-being and sustainability issues. HAs' traditional identity revolves around providing affordable housing and homes for vulnerable populations. While creating healthy places for residents was perceived as a core mission for the HA to fulfil its responsibility, the sustainability work's benefits have not been widely recognised. Several interviewees contended that the environmental sustainability issues deviated further from the HA services than health and wellbeing issues. Decision-makers perceived the core mission as being to 'provide houses, that is the primary thing that we do', and working with residents was described as 'our business'. Consequently, although there might be general underlying goodwill to deliver, environmental sustainability issues were perceived as irrelevant and 'won't always be the priority because the organisation needs to sort itself out'.

The well-established routines through the formal structure reinforce the notion that healthy housing is at the core of the business. In regeneration projects, the social value coordinator from the HA's charity department worked alongside the contractors, who have contractual obligations to identify social value projects (employment, training, community support activities, etc.). This has gradually become a routine to ensure the delivery of social values. In comparison, the sustainability consultant must be recruited externally. Paradoxically, the sustainability manager explained that the key strategy to encourage sustainability work is to frame sustainability issues' co-benefits around health and wellbeing issues.

Table 5-2: Tensions in decision making and example quotations.

Tensions in decision-making	Quotes
Tensions in decision outcomes: financial efficiency or social missions	*It's financial concerns, I think is the priority because if you don't have a business plan that stacks up, you don't have a project, really. The first things in terms of getting approval for a new project is that it financially works and although we are a charity, so we are not there to make a lot of money, but at least the money that you make needs to cross-subsidise the affordable, so at least it needs to stack up financially. It's not about making profit, it's about being viable. (RM2, 2019)*
	housing associations have come under a lot of pressure to build more and build more for less because grants and money from central government has almost disappeared now, so [the HA] would have been receiving a lot of money in grant from government, going back five years/ten years and now they get almost nothing, so that pressure has meant that they have had to behave much more like commercial organisations, rather than more balanced, pseudo-public organisations – and it's ongoing – I think we're going to see more and more of that consolidation. (S11, 2019)
	Right now we still don't know about the true cost [for different regeneration options]... I am conscious that we need to get the work aligned with what we are going to [do] at the organisation… and as soon as we speak with the council the better. (Site F Meeting 17)
	… we're certainly looking at the numbers, based on the scheme you [the architect] worked up for us before, hugely in deficit per unit, no way would we get approval for it, so we have to see if we could try this option to see if there's a way we can get it closer to what would be an acceptable deficit…but if we can get it to an acceptable deficit where we would contrast that against the cost of trying to refurb it, then we might be in with a shot. (Site E Meeting 10)
Pressure of compliance and changes:	*I would say because the fabric is really, really efficient, so from that point of view, even if you increase ventilation much more, it's not a relative increase in performance, the performance is already very good, but we are looking at things like PVs, we're trying to maximise them on the roofs, but again, with the current requirements, even if you put PVs throughout all the roofs, you still need to provide some sort of compensation in terms of CO^2 reduction. (D12, 2019)*

minimum standards or beyond	*However, regulations change almost on a yearly basis, so every time we started a phase of [regeneration site], for instance, we need to make sure that we are not falling behind because we could argue that it was approved based on those regulations… so each phase will relate to the current regulation or the regulations that are coming in the short term, rather than just sticking to what was approved, so we need to be up to speed with that, always. (D13, 2019)*
Identity tensions: balancing needs or prioritising health over sustainability	*There's a lot of pressure from them to reduce the number of areas where the project is doing more than mandatory requirements, so [the regeneration manager] has almost had to reduce the number of areas where he's doing more and I think that has, generally, impacted the environmental more than the social… So because the London Planning Policy is pretty tough on energy and carbon and materials, actually, even meeting the minimums is now quite hard, so I think the vision has got a little bit diluted and it's been about 'well, for carbon, we're just doing what planning tells us because that's hard enough,' whereas for other areas, whether it's apprenticeships or it's something more social impact, these are the areas where there are the opportunities to do something bigger and better, so I think that's probably why it felt a little bit weighted towards social. (S11, 2019)*
	… so it's more of a social focus that we have…, the term 'social value' can stretch, it can include sustainability, circular economy, things like that as well, but yes, us being a social housing provider primarily, our focus is more social – probably economical as well... (C8, 2019)
	Fundamentally, we provide houses, that is the primary thing that we do, so are they the right quality, how do we make the places in that function well, so that might then fall into things like sustainability, carbon footprint, all of that sort of thing but we're looking at that as a primary driver... (SR6, 2019)
	I think there's more of a financial incentive for us for [healthy housing] and I think our business is more social than it is environmental and that creates issues… Clearly, the driver for something like [healthy housing] is if you get residents into sustained employment, then they're more likely to pay their rent, so it's like a win-win situation, whereas for sustainability, of course, there's a massive issue as to why you'd want to deliver a sustainability programme, but it's not quite the same. (SR7, 2019)
	What's maybe different to a normal corporate player is the fact that because we have a social purpose, we are about housing for people who the market has failed, we do deal with the cohort of population, generally speaking, who are in the bottom quartile, so we have a focus, effectively, on development and improving people's lives, so it's about trying to... if I set very high environmental ambitions which have a cost to it, I've got to recognise who is going to be bearing the cost of that. (S10, 2019)

5.5.2 The complexities of decision process factors

Aside from the above-described tensions within decision issues, the dynamics in decision-making rules are further influenced by three aspects: managing goals, decision-making power, and learning.

5.5.2.1 Managing goals

Forming goals. This comprises the process of synthesising information and developing specific goals. Typical formats of goals include the number of new homes in regeneration, the portion of affordable homes, and what social and sustainability aspects to include in the design options. Decision-makers mentioned gaps of forming goals in developing sustainability and social and well-being measurements. They suggested clarifying measures within policy regulations or strategic documents that explain impacts and outputs that can guide decision-making. The timing of forming goals is also a critical factor in decision-making. According to one interviewee, ‘so you can bring new things to the table, on the vision, but a lot of it is set up at the planning stage’, stressing the early stages as the vital period to introduce major ideas. The early stage was the critical window for incorporating a health and sustainability agenda into the master plan. However, as the meetings suggest, decision-makers must also focus on policy compliance, community engagement, and cost analysis early on to ensure the project's viability.

Weighting goals. Decision-makers adjusted the weights of multiple goals in the decision-making process. A typical example is that although the delivery of healthy and sustainable housing was agreed upon as a shared goal, the importance of the two topics can drastically differ. In comparison to health and well-being goals, sustainability topics are described as ‘less clear and measurable’, ‘extra’, or ‘complex’. Decision-makers suggested that clarified measurements that explain impacts and outputs can guide the decision-making process. However, precise measurements do not necessarily appear to lead to evaluations. One interviewee stated that no post-build evaluation had been observed yet. Additionally, social and well-being measures remain challenging, as issues outside of the charity arm’s work were also perceived as not clearly defined.

5.5.2.2 Stimuli with a powerful influence on attention

Powerful stimuli from regulations. Policy standards and regulations serve as powerful stimuli. Since decision-makers must submit a master plan to obtain planning clearance and since the sustainability of the regeneration plan is strongly related to the number of

affordable dwellings and the social value, attention to health and well-being and quality housing design are particularly significant during the early-stage meetings. Policy changes and market changes also increase attention to costs. Planning policies were described as changing 'on a yearly basis'. Consequently, the decisions must be adjusted according to policy changes.

Powerful stimuli from strategies. Strategy-level clarifications serve as powerful stimuli. Internal strategies and sustainability change the goals and weights of goals within social missions. During the observation, the organisation was internally under strategy review. Interviewees mentioned that strategy reviews also could engender opportunities to integrate the corporate sustainability strategy internally. Although revisiting the business plans and guiding strategy plans results in strategic and project delays, individuals acknowledged that this is necessary to be resilient in the face of future uncertainties and challenges.

Powerful stimuli from leadership. Hierarchy influences the process of integrating information sources and adopting specific ideas. Top-down decisions and the application of social mission logic serve as powerful stimuli. Board members, executives, and project leads were described as wielding strong decision-making power. Direct support from the above, such as ownership of the issue, is essential, indicating the challenges of decision-making related to environmental sustainability topics when decision-making power is lacking. Due to frequent changes in the top leadership team after a merger event, top-level support for environmental sustainability topics was recognised as insufficient.

Another example is that a working group was formed to integrate the social value of sustainable and healthy housing. The core team included top managers of the regeneration project, sustainability consultants, and social value coordinators, forging a communication channel that afforded regeneration project members opportunities to communicate their ideas. Forming working groups and hiring external sustainability consultants helped the team develop specific plans for increasing energy performance and implementing a circular economy, which were the team's adopted ideas. For the broader organisational context, the manager at the sustainability department made similar attempts to connect energy efficiency with business strategies via the integration of sustainability in the strategies.

Additionally, an interviewee from the charity department stated that ‘our own priorities, they are set each year, at quite a high level, so that our director and our head of service will identify priorities and then targets for the year’. In relation to sustainability issues, it was suggested that the project lead is driving the circular economy agenda, which is a crucial sustainability approach within regeneration projects. Although sustainability is not prioritised at the organisational strategy level, the sustainability agenda within the regeneration field was driven by the project lead and by others ‘keen on it’. Nearly every interviewee expressed that the regeneration project lead has a strong personal interest in sustainability and place-making, directing the team’s work toward sustainability issues and bringing ideas and business cases to the investment committee and board members. As a result, people are a powerful catalyst of sustainability in addition to the strength of the business strategy.

5.5.2.3 Organisational learning and knowledge

Regeneration was described as a new practice, although the legacy HAs had long-term experience with regeneration projects before a major merger. Following the merger, changes allowed the HA to shift from a traditional manner of following planning guidelines toward a closer understanding of the organisation’s priorities. Learning about social mission logic is a crucial information source and is referenced in decision-making at meetings. In the meetings, references to cases and instances pertinent to the experience of social mission subjects were frequently made. The interviewees mentioned that the organisation needed to find their own goals, as the external agenda changed often, indicating that frequent external changes appeared to pressure the organisation to develop more internal goals. The regeneration team aimed to build knowledge regarding delivering circular economy goals to inform the other regeneration projects in the industry. The architects also described a lengthy period of knowledge development for the circular economy through internal workshops.

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Table 5-3: Complexities of decision-making rules and example quotations. Note: see interviewee code from Table 4-4.

Complexities of decision-making	Example quotes
Forming goals and options	*We're building for a hundred years, therefore, the decisions we're making about materials, window design, balconies, door entry systems, the hard surfaces in the parks and the energy systems, all have to be to a view to 10, 20, 30 year cycles（RM1, 2019）*
	so, in terms of health, resident health, I don't think that we still have a clear position on it. I think that we're being pushed in terms of health because of government …in some parts of the business, that helped to focus our attention on health and housing, particularly on health of new build housing. (SR7, 2019)
Weighting and prioritising goals	*Because we can't do it [a new sustainability task], it's an extra, it's not what we do every day, so not only we don't know what to do yet, but also, we've got a daily job, so that's an extra that requires a lot of attention because it's not a standard thing that we know how to do it. (RM2, 2019)*
	… the amount of time you can think about the sustainability aspects of the offices is limited, so there are always other corporate objectives that will grate up against sustainability and it's then balancing off on those, that's what you need to do and where the resource, where the investment's directed, where the business focus is, there's lots of different things happening in the business because it is such a massive business with lots of different things going on. (S10, 2019)
Powerful stimuli from regulation	*..there is an emerging regulation about CO^2 and how buildings should perform and again, if the energy strategy for the whole masterplan was approved based on a previous regulation, it's how you now implement these coming, emerging policies into the masterplan and that has a cost impact, but also might have some infrastructure impact and to co-ordinate all that... there's a balance between the cost and the benefits and obviously, the client will have a strong say on that as well because they have a business programme and a business plan and that, they have allowed a cost for certain items and sometimes, if you try to implement something different, this will impact the house and the*

	cost plan, so it's a very thin line that you have to find a balance and then you have the planners pushing for the new stuff… so it's how you merge all this together and try to offer the best possible for that phase. (D13, 2019)
Powerful stimuli from strategy	*It [the motivation for building an energy centre] is policy driven, but it also reflects [the organisation's] policy targets. So you know we are pushed by policy, but they don' have to push to hard because we want to do it anyway. (RM1, 2019)*
Powerful stimuli from people	*We've dabbled with circular economy... so we are members of the UK Green Building Council. I think we're the only housing association who are and that's driven by a couple of people, internally, who are very keen on that, so yes, it's a thing we're looking at, we're not 100 per cent on where we are with it yet. (SR6,2019)*
Organisational learning	*Neither of them [legacy housing associations] really did regeneration before, so we're good at the housing association side of things... We don't understand the complexity of building out homes as well as we should... (RM1, 2019)*
	Generally, for the industry, circular economy is quite new, so we're learning as we go along, but I think, almost instinctively, there were some principles we were integrating already in the design, so for example, putting aside the fact that the kitchens had to be adaptable and so on. (D12, 2019)

5.6 A causal loop diagram of dynamics of decision-making in regeneration

This section presents a CLD (see section 4.5.3 for example CLDs), providing structural explanations of why the focus of attention change-over-time. The CLD synthesises the qualitative findings into the main causal structures of decision-making dynamics in urban regeneration projects, which seeks to explain the change-over-time attention patterns described above.

The CLD summarises the causal structures contributing to the change-over-time attention patterns described above. The CLD includes four main sectors: attention allocation and competition, the paradoxical focus on sustainability and health, community engagement and impact on housing conditions, and financial viability. This section describes the sectors in detail and explores the CLD sector by sector.

5.6.1 Attention Allocation and Competition

The first causal structure in decision-making systems relates to attention to sustainability and health and well-being (HW) and their shifts to attention to financial costs and risks. The two attention variables are highlighted with boxes in Figure 5–6. *Attention to HW* increases the *organisational routines for HW*, further increasing team members' *attention to HW*, forming the reinforcing loop 1 (***R1): Focus on HW***. In the case study, the HA had a formal charity arm dedicated to social missions within the HW, generating practices and guidelines to support HW tasks.

Figure 5–6: Attention to health and well-being. Note: Attention categories are highlighted with boxes. The directions of the links show the direction of impact.

The second component of attentional structures is attention to sustainability. Another loop ***R2 Focus on sustainability,*** as shown in Figure 5–7, describes a similar mechanism to R1, but *measurements of sustainability outcomes* were explicitly mentioned as a key step

in guiding decisions. Specifically, external consultants were hired to help the team establish sustainability goals to inform the project design. R1 facilitates R2, as the focus on HW and routines increases *perceiving the sustainability benefits.*

Attention capacity is identified as another mechanism contributing to sustainability, as shown in Figure 5–7, Organisational attention was described as a limited resource that involves competition for decision-makers' attention, limiting the growth of R1 or R2. The higher *attention to sustainability*, the lower *remaining attention available*, and the lower *the long-term thinking capacity*, which lowers the *attention to sustainability*, forming balancing loop 1 (***B1): Sustainability requires attention capacity***. The following shows the impact of attention limitation on sustainability goals:

> *'What's maybe different to a normal corporate player is the fact that because we have a social purpose, we are about housing for people who the market has failed, we do deal with the cohort of population, generally speaking, who are in the bottom quartile, so we have a focus, effectively, on development and improving people's lives... if I set very high environmental ambitions which have a cost to it, I've got to recognise who is going to be bearing the cost of that.' (S10, 2019)*

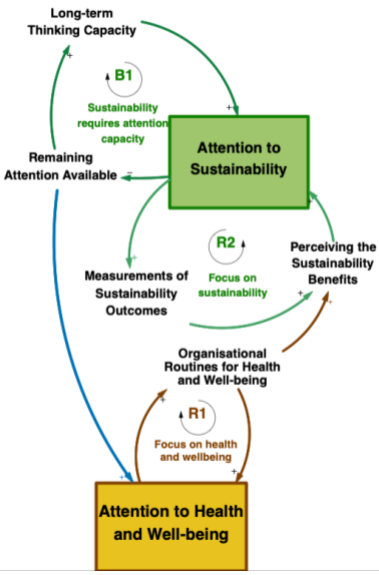


Figure 5–7: Attention to sustainability

Despite the similarities between R1 and R2, the activation of the two loops depends on different decision rules. Top-level ownership of sustainability issues increases *attention to sustainability*, while the identity of a social landlord increases attention to HW. The interviewees agreed that sustainability is a core mission for the organisation, but in comparison to HW goals, sustainability topics were described as "less clear and

measurable", "extra", or "complex", suggesting that there were barriers associated with R2 in terms of decision-making. Board members, executives, and project leaders were described as having decisive decision-making power for sustainable strategies. As a result of frequent changes in the top leadership team after a merger event, top-level support for environmental sustainability topics was recognised as insufficient.

The last component of the attention structures is attention shift, as shown in Figure 5–8. Interviewees mentioned that, unlike private housing developers, HAs created financial surpluses to reinvest in additional social logic. Thus, all decisions need to ensure that the financial costs are viable and can be reimbursed by the development value from the regeneration project. In regeneration meetings, when the HA considers cross-subsidising affordable housing and social missions, *attention to HW* was shifted to *attention to financial costs and risks*, reducing the *remaining attention available*, forming ***B2a Shift focus from HW to financial issues.*** Additionally, the higher the *attention to financial costs and risks*, the more decision-makers *perceived sustainability as extra& expensive*, reducing *attention to sustainability*, forming another "shift focus" balancing loop: ***B2b Shift focus from sustainability to financial issues.***

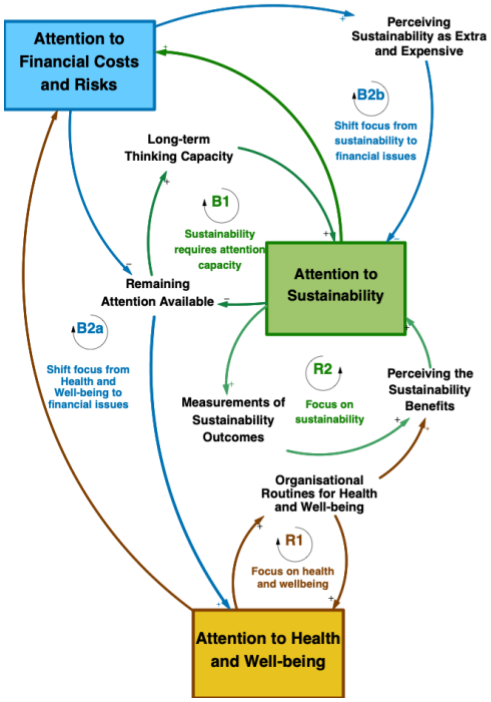


Figure 5–8: Attention shift

The shifts in attention were observed in meetings, contributing to the dominance of attention to financial matters, as shown in Figure 5–3. Interviewees reported that the decrease in government funding was one of the main policy changes in the previous decade. Given the "external pressure" resulting from a relative lack of sufficient grants, HAs increasingly used institutional funding or bonds raised on the market, increasing the strength of B2a and B2b. The following quote described the challenge of focusing on sustainability tasks:

> *'Because we can't do it [a new sustainability task], it's an extra, it's not what we do every day, so not only we don't know what to do yet, but also, we've got a daily job, so that's an extra that requires a lot of attention because it's not a standard thing that we know how to do it.' (RM2, 2019)*

Figure 5–9 highlights the unfolding of the three sub-structures for attention allocation.

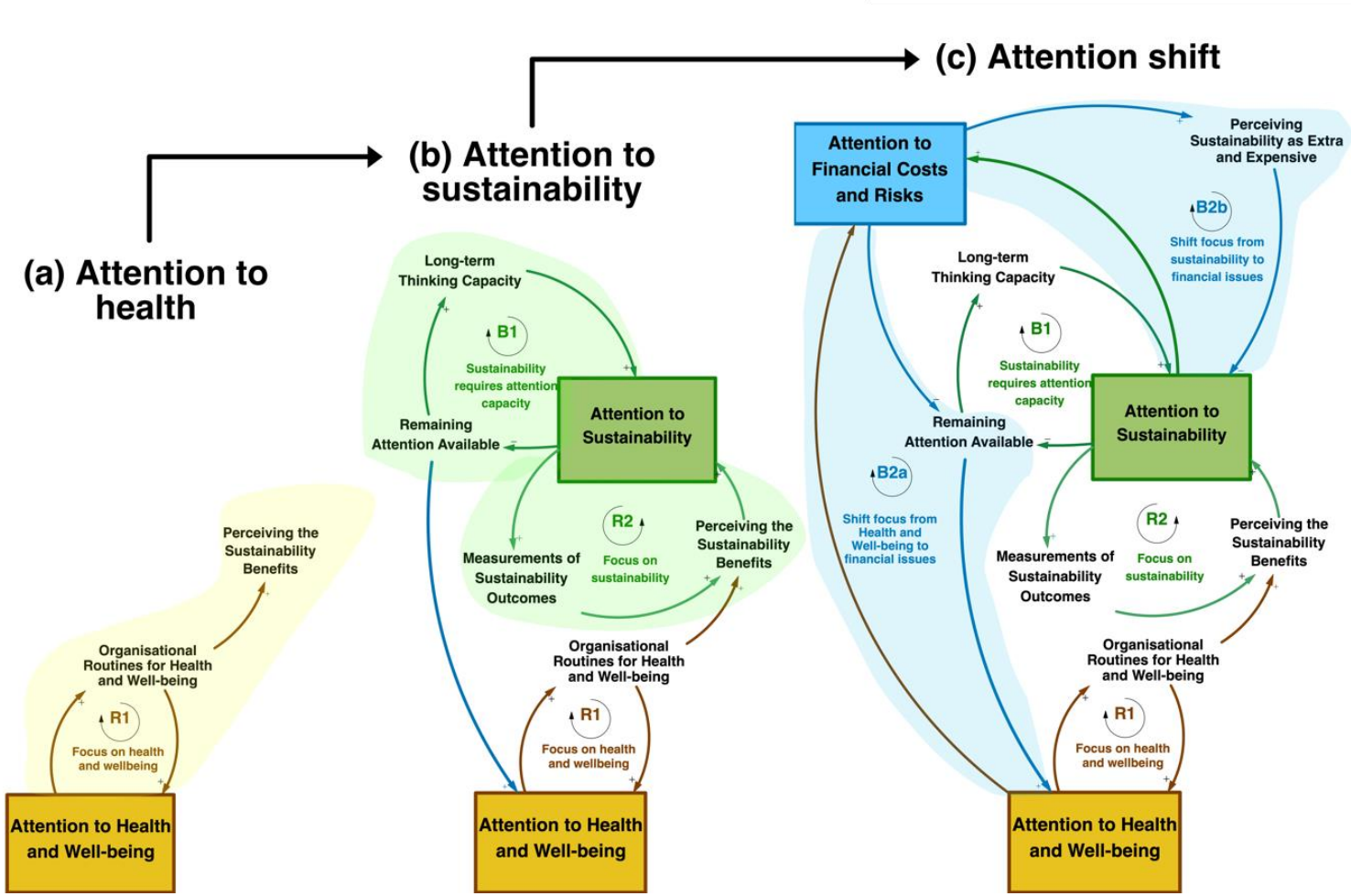


Figure 5–9: Causal structures in attention to health, well-being, and sustainability.

5.6.2 Paradoxical Focuses on Sustainability and Health

The regeneration team described *environmental sustainability goals* as "sustainable places, rather than just housing" and "buildable and more efficient and better residential schemes", which shows that the framing of sustainability is not just environmental in character but also includes the interconnection between people and nature. The increase in *attention to sustainability* produces more opportunities to discuss *environmental sustainability goals*. Frequently mentioned topics include building performance, on-site recycling, and energy utilities in the home such as new boilers. The circular economy was mentioned in meetings and interviewees saw it as a critical strategy to increase sustainability outcomes. The provision of on-site recycling in the construction phase, providing appliances such as new boilers in homes, and designing green spaces and tree planting were viewed as sustainability design opportunities. As shown in the middle section of Figure 5–10, via the loop of ***B3 Regeneration closes environmental gaps***, regeneration increases *environmental sustainability*, decreasing the *gaps in environmental sustainability.*

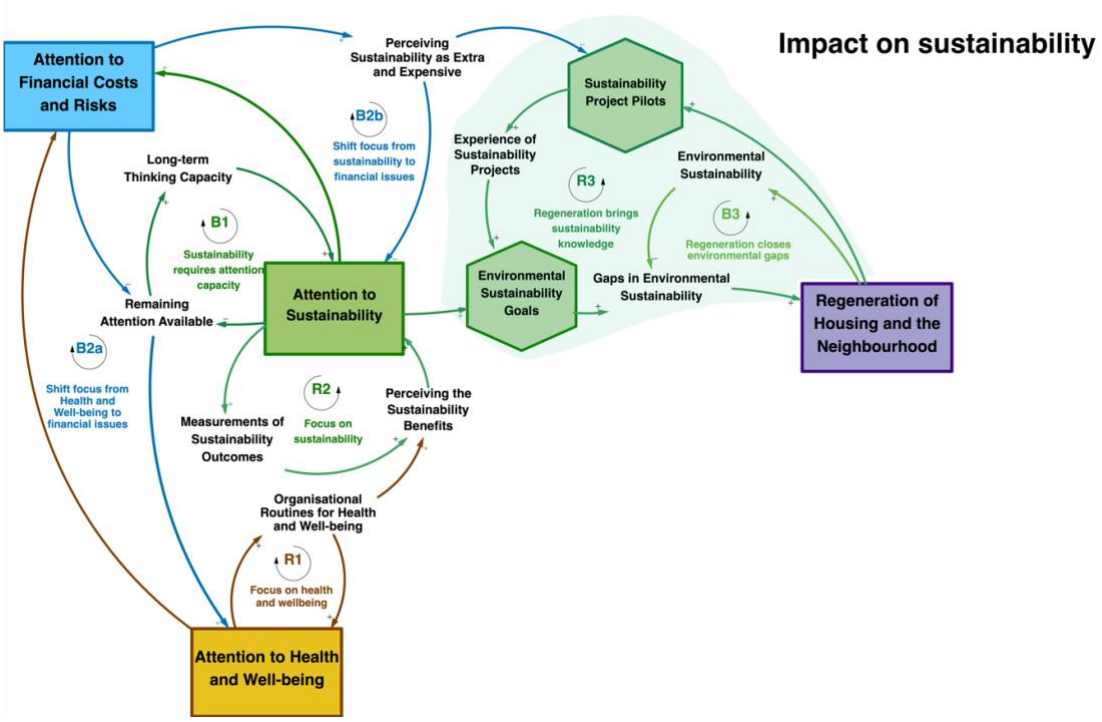


Figure 5–10: Attention to sustainability and impacts on sustainability

In parallel, the *sustainability project pilots* increase the *experience of sustainability* projects, which increases the *environmental sustainability goals*, helping decision-makers recognise the *gaps in environmental sustainability*, which forms a reinforcing loop ***R3***

Regeneration brings sustainability knowledge. R3 has a key role in activating B3. As interviewees suggested, knowledge of sustainability projects is critical as it can provide historical examples, which were observed in meetings. Overall, regeneration was described as a new practice, although the HA before the major merger had experience in regeneration projects. Following the merger, changes allowed the HA to shift from a traditional way of following planning guidelines to a closer understanding of the organisation's priorities. Cases and examples based on their experience in social mission-based projects (HW and sustainability) were frequently used in the meetings as references. The regeneration team mentioned potential pilot projects to develop knowledge in delivering circular economy goals and to inform other regeneration projects in the industry. The architects reported that knowledge development in the circular economy can take a long time.

R3 is closely linked with the attention shift from sustainability to finance (loop B2b), in which the growth or decline in *perceiving sustainability as expensive and an extra* influences the extent to which the focus will shift to financial topics. R3 also relies on R1: interviewees stated that if co-benefits between sustainability and health can be perceived, the perceptions of sustainability benefits increase the strength of R2's focus on sustainability. The inclusion of sustainability outcomes in funding requirements and policy standards are other critical triggers for perceptions of sustainability benefits. However, paradoxically, although *attention to HW* increases *perceiving sustainability benefits*, which triggers R3 and B3 and then increases *attention to sustainability*, it was reported that the incentive for sustainability topics is less than for healthy housing, as the following quotes demonstrates:

> *'I think there's more of a financial incentive for us for [healthy housing] and I think our business is more social than it is environmental and that creates issues… Clearly, the driver for something like [healthy housing] is if you get residents into sustained employment, then they're more likely to pay their rent, so it's like a win–win situation, whereas for sustainability, of course, there's a massive issue as to why you'd want to deliver a sustainability programme, but it's not quite the same.' (SR7, 2019)*

According to the architects, meeting even the minimum policy standards in building performance is challenging. The architect stated that aside from improving materials and ventilation and using PVs on roofs, offsetting CO^2 was still needed to fulfil policy compliance. As the "London planning policy is pretty tough on energy and carbon and

materials", the decision-makers were pressured to reduce the social mission issues more than mandatorily needed, which impacted sustainability to a greater extent than in conventional social missions.

Part of the reason for this perception difference was related to the organisation structure and the status given to the HW-focused charity arm. As the social value coordinator from the charity arm said: “the term ‘social value’ can stretch, it can include sustainability, circular economy, things like that as well, but yes, us being a social housing provider primarily, our focus is more social”. Furthermore, according to another social value manager: “our own priorities, they are set each year, at quite a high level, so that our director and our head of service will identify priorities and then targets for the year”, which again highlights the importance of people’s power in delivering sustainability topics. The well-established routines throughout the formal structure reinforce the idea that healthy housing is at the core of the business. In regeneration projects, the social value coordinator from the HA's charity department worked alongside the contractors who had contractual obligations to identify social value projects (employment, training, community support activities). This has gradually become a routine approach to ensure the delivery of social values. In comparison, the sustainability consultant was still recruited externally. Paradoxically, the sustainability manager said that the key strategy to push sustainability is to frame the co-benefits of sustainability topics inside health and well-being topics.

Furthermore, HAs' traditional identity is based on providing affordable housing and providing homes for vulnerable populations. The identity of a social landlord increases the perceived HW value. While creating healthy places for residents was perceived as a core mission for the HA, the benefits of sustainability work were not widely recognised. A few interviewees said that environmental sustainability topics fell further outside of the HA’s scope than health and well-being topics. Decision-makers perception of the fundamental mission is demonstrated in the following: "we provide houses, that is the primary thing that we do. So are they the right quality? How do we make the places in that function well?" Consequently, although there might be general underlying goodwill to deliver, environmental sustainability topics were perceived as less relevant and "won't always be the priority because the organisation needs to sort itself out". The following quote shows the impact of attention competition on attention to sustainability:

> *"There's a lot of pressure from them (the regeneration team) to reduce the number of areas where the project is doing more than mandatory requirements, so [the regeneration project lead] has almost had to reduce the number of areas where he's doing more, and I think that has, generally, impacted the environmental more than the social." (S11, 2019)*

5.6.3 Engaging Community for Health and Well-Being

Aside from gaps in environmental sustainability, regeneration of housing and neighbourhood depends on gaps in housing conditions. For ***B4 Regeneration closes housing condition gaps***, as shown in Figure 5–11, regeneration improves *housing conditions*, the physical state of dwellings, closing the *gaps in housing conditions*. The regeneration team attempted to develop "place-based" approaches to maximise regeneration scheme outcomes. Specific health and well-being concerns were discussed in terms of the local community's health and well-being, such as children's and ageing residents' health needs. As pointed out by one interviewee: "these older persons' housing units are generally in a relatively poor state", and ageing strategies were discussed. For properties in poor conditions, the regeneration team explored options to refurbish or regenerate, and the organisational housing standard was frequently mentioned during meetings, which sets the level of investment to upgrade the HA's properties by upgrading heating systems, roofs, kitchens, and bathrooms, or via regeneration projects. Moreover, fuel poverty was linked with residents' health, work performance, and poverty.

Architects stated that *regeneration of housing and neighbourhood* was viewed as a chance to *design fitting people's needs*, decreasing *housing problems* and *reputation risks*, as shown in ***B5 Regeneration mitigates housing problems***. Especially in the early meetings, the number of social rent homes, existing housing residents being rehoused, and the balance between two-bedrooms and larger properties to address the overcrowding problem were important topics. The estate managers said that multiple surveys, individual conversations, and public consultation events were used to understand residents' visions of the regeneration project and to inform the architects' designs, for example, by including flexible or adaptable kitchens.

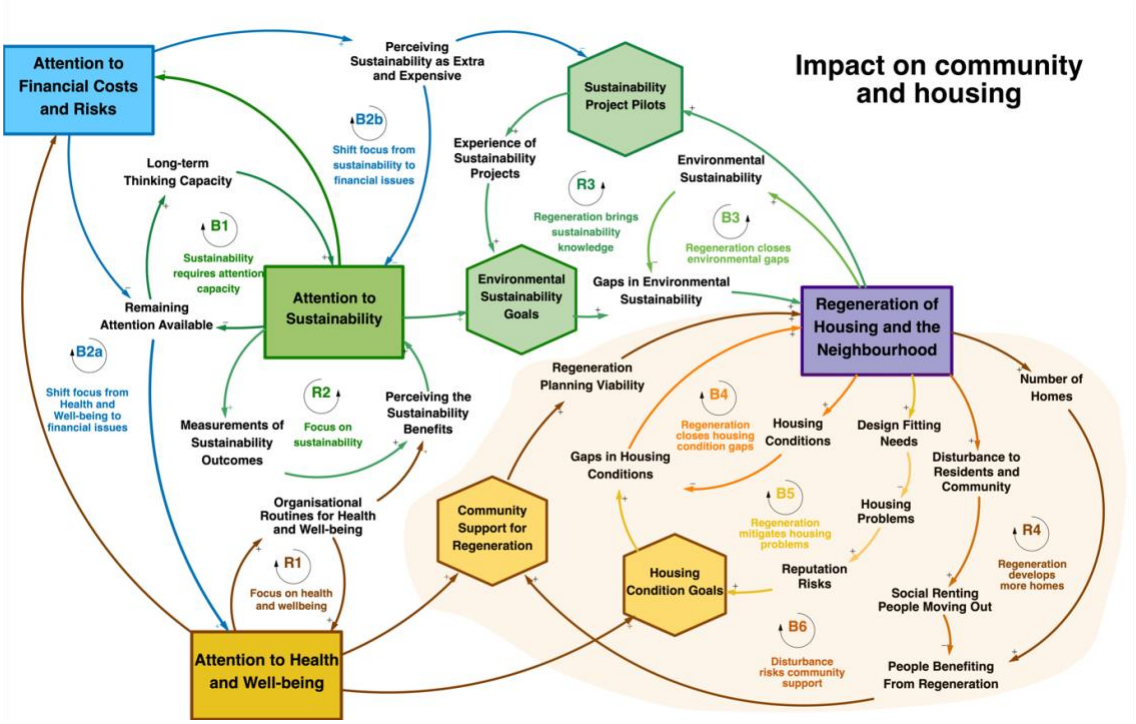


Figure 5–11: Impact on community and housing conditions

Community support for regeneration is uniquely important, as it decides if the community and the HA will reach an agreement in starting regeneration projects, which essentially decides the *viability of the regeneration project*. On engagement topics, "community buy-in", "residents' support", and "residents' agreement" were described as essential elements for project approval and were frequently mentioned in meetings. At an early stage, the engagement activities included exploring housing tenures and demand and opportunities for the HA to buy back properties to increase landlord responsibility over the estate. Regeneration increases *the number of homes*, which increases the *people benefiting from regeneration*, which is part of regeneration viability, providing that regeneration creates more homes (***R4 Regeneration develops more homes*** in Figure 5–11). Attention to local policy compliance predominantly in the meetings included conversations around the number of affordable homes, including shared ownership houses and socially rented flats.

However, regeneration inevitably creates disturbance for residents and the community, which can result in social renting people moving out, decreasing the number of people benefiting from affordable housing (see **B6 Disturbance risks community support** in Figure 5–11). Concerns over potential disturbances were mentioned in both interviews and meetings. According to interviewees, demolition and decanting is too slow, as "moving people and finding them homes does take a long [time]". During the planning-

stage meetings, which discussed the potential of regeneration, decision-makers clearly stated that regeneration can bring "significant disruption" to the community and people, resulting in a series of activities involving communicating with freeholders, leaseholders, and homeowners using residential offers that provided residents with various options.

5.6.4 Viability and Financial Efficiency

Interviewees said that the continuous decrease in government funding was pushing the organisation to consider financial efficiency. As shown in the upper-right of Figure 5–12, *regeneration financial performance* is critical, as the HA relies on developing and selling housing at market value to subsidise the regeneration project and the costs for affordable housing and broader health and well-being goals.

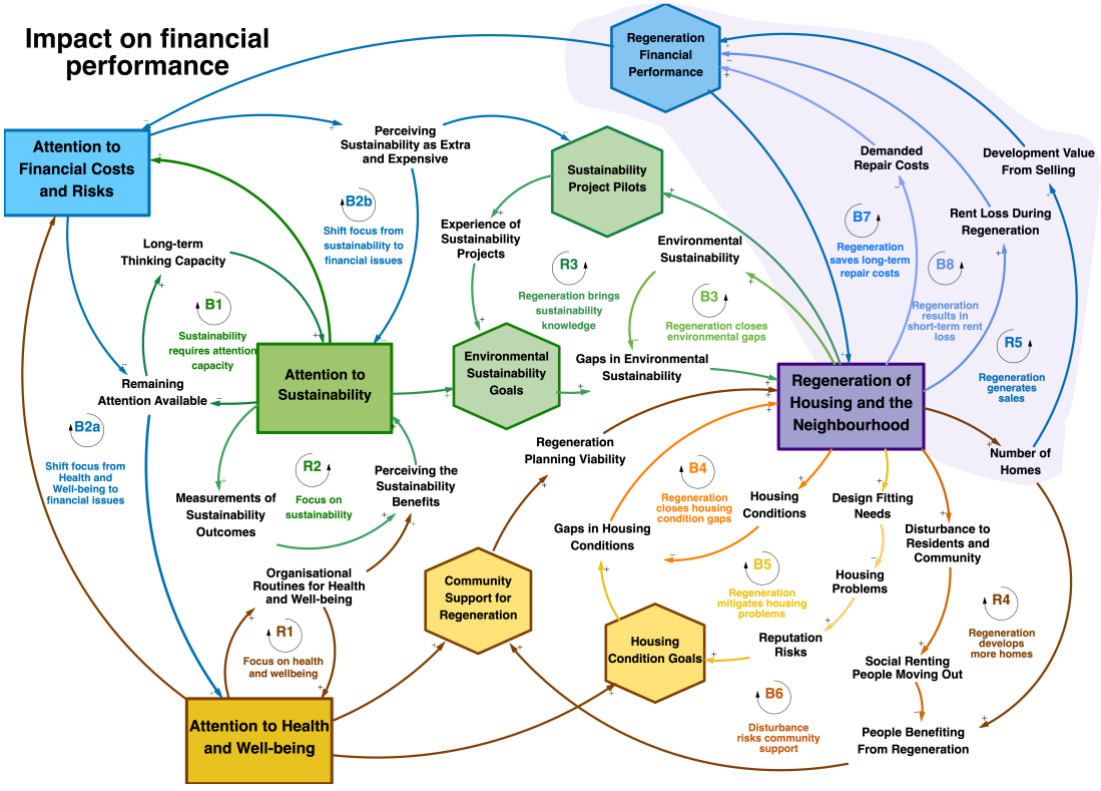


Figure 5–12: Impact on financial performance

Costs over time were used as a critical criterion to assess the options of demolition or regeneration. Specifically, building costs include all costs from the planning, demolition, and construction. The costs also include *rent income loss during regeneration* over the subsequent years of construction, and the *demanded repair costs* for poor-condition homes. The higher the long-term *repair costs* or the lower *rent loss*, the more favourable the regeneration option. Decisions in housing tenures (social ownership, social rent, and private sale) significantly influence the projected financial returns. As described by a

consultant in one of the planning meetings, private sales can “offset some of the lower (housing) values, especially in the shared ownership units”.

In the CLD, B7, B8, and R5 describe how financial aspects are considered in regeneration. The variable *regeneration financial performance* describes the excess expenditure in regeneration activities over the sales income and funding. Regeneration is viable when the *demanded repair costs* decrease (***B7 Regeneration saves long-term repair costs***), the *rent income loss* decreases (***B8 Regeneration results in short-term rent loss***), and the *development value from selling* increases (***R5 Regeneration generates sales***).

Decision-makers clearly stated that urban regeneration is complex and they made continuous attempts to address multiple social facets, such as residents’ employment and quality of life, through the regeneration project. However, the trade-off between building financial efficiency and delivering health and sustainability at a scale was suggested as the main challenge. Decision-making was described as “finding a balance” between financial costs and outcomes to reach satisfying result as the following quote demonstrates:

> *'It’s financial concerns, I think is the priority because if you don’t have a business plan that stacks up, you don’t have a project, really. The first things in terms of getting approval for a new project is that it financially works, and although we are a charity, so we are not there to make a lot of money, but at least the money that you make needs to cross-subsidise the affordable, so at least it needs to stack up financially. It’s not about making profit, it’s about being viable.' (RM2,2019)*

The HA was described as a "very operational, reactive, responsive organisation", and the role that the frequent regulation changes played in decision-making was stressed. The architects said that the external planning guidelines were changing too quickly, "almost on a yearly basis", which often drives attention towards monitoring or forecasting planning standards and considering the implications on project viability. This results in increased attention to financial costs and risks, contributing to the up-and-down tendency as regards attention to policy, especially in the planning stages.

Figure 5–13 presents the full CLD. In summary, the CLD shows that attention to HW (R1), and sustainability (R2, B1), compete with attention to financial efficiency and costs (B2a, B2b). The attention competition influences and is being influenced by the place-making system. Specifically, the sustainability outcomes (R3 and B3) are directly linked with the attention competition structure, and engagement in community (B4, B5, R4, and

B6) is closely linked with the attention to health and well-being. Consideration of viability and financial efficiency (R5, B7, and B8) can trigger attention to financial costs and risks, which further triggers the attention shift mechanisms (B2a and B2b). Table 5-4 shows the causal structures in each sector. Table 5-5 provides a zoomed-in description of each loop.

Table 5-4: Causal structures within each sector

Sectors	Reinforcing	Balancing	Loop Name
Attention Allocation and Competition	R1		Focus on HW
	R2		Focus on sustainability
		B1	Sustainability requires attention
		B2a	Shift focus from HW to financial issues
		B2b	Shift focus from sustainability to financial issues
Paradoxical Focuses on Sustainability and Health	R3		Regeneration brings sustainability knowledge
		B3	Regeneration closes environmental gaps
Engaging Community for Health and Well-being		B4	Regeneration closes housing condition gaps
		B5	Regeneration mitigates overcrowding issues
	R4		Regeneration creates more homes
		B6	Potential disturbance challenges project viability
Viability and Financial Efficiency	R5		Regeneration generates sales
		B7	Regeneration saves long-term repair costs
		B8	Regeneration results in short-term rent loss

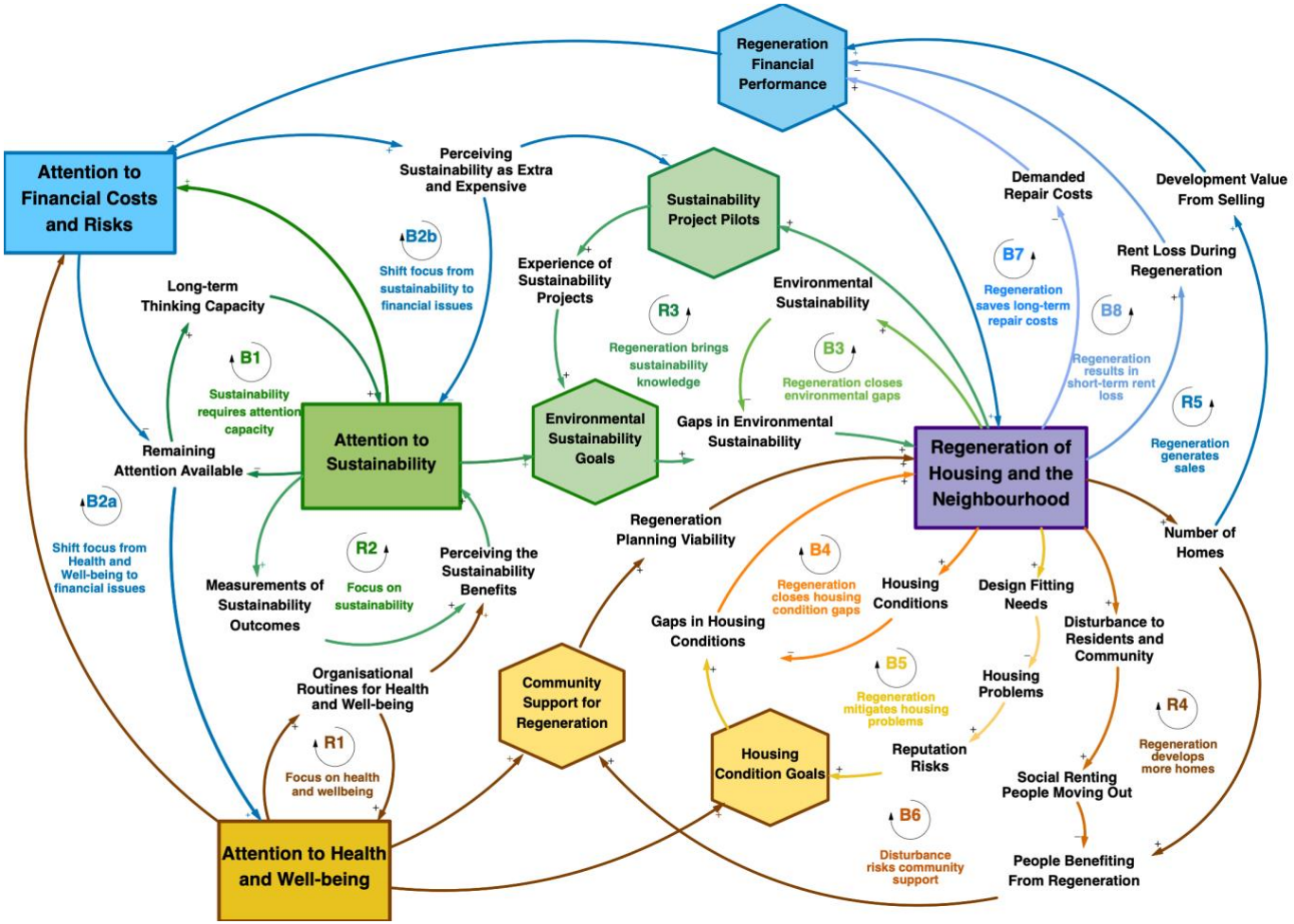


Figure 5–13: Full CLD. Causal mechanisms interconnecting attention and urban regeneration. Variables that connect the attention allocation system and regeneration impacts are highlighted with hexagons.

Table 5-5: CLD loop description, linking with decision issues, rules, and changes of focus. *Note*. Verbs that describe increase or decrease are highlighted in red in italic.

Loop	Loop description	Decision issues	Decision-making factors	Changes of focus
R1	An *increase* in attention to health and wellbeing leads to an *increase* in perceptions of value of health and wellbeing, *reinforcing* attention to health and wellbeing.	Health and wellbeing	Weighting goals when the HA's identity as a social landlord is activated	Reinforces attention to health and well-being
R2	An *increase* in attention to sustainability leads to an *increase* in measurement of sustainability, *increasing* perceptions of sustainability benefits, which *increases* attention to sustainability.	Sustainability	Forming goals as more attention to sustainability is transformed to measurements, providing strategy power to pilot projects.	Reinforces attention to sustainability
R3	An *increase* in regenerate housing and neighbourhood leads to an *increase* in opportunities to pilot projects, *increasing* experience of sustainability, which *increases* environmental sustainability goals, *increasing* gaps in environmental sustainability, *increasing* regeneration of housing and neighbourhood.	Environmental sustainability	Regeneration provides the opportunity to pilot projects, increasing the learning and experience as reference in decision-making, which increases the weighting of sustainability goals.	Reinforces attention to environmental sustainability
R4	An *increase* in regenerate housing and neighbourhood leads to an *increase* in number of homes, *increasing* people benefiting from regeneration, which *increases* community support for regeneration, *increasing* regeneration viability, *increasing* regeneration of housing and neighbourhood.	Health and wellbeing (affordable housing)	Identity as a social landlord leads the HA increase the weighting of the affordable housings goals	Reinforces attention to health and well-being

R5	An *increase* in regenerate housing and neighbourhood leads to an *increase* in the number of homes, *increasing* development value, *increasing* regeneration financial performance, *increasing* regeneration of housing and neighbourhood.	Market efficiency (development value)	Consideration of development value from regeneration	Reinforces attention to market efficiency
B1	An *increase* in remaining attention available, increases long-term tanking capacity, increasing the attention to sustainability, which decreases available attention.	Environmental sustainability	Form goals when there are attention available.	Balances attention allocation
B2a	An *increase* in attention to health and wellbeing leads to an *increase* in attention to financial costs and risks, which *decreases* total attention available, and attention to health and wellbeing.	Health and well-being Market efficiency	As the HAs need to identify financial resources for the social mission initiatives, the goals are shifted to the allocate resources	Shifts from health and wellbeing to market efficiency
B2b	An *increase* in attention to sustainability, *increasing* financial costs and risks, which leads to an *increase* in perceiving sustainability as extra and expensive, *decreasing* the attention to attention to sustainability, which *decreases* the attention to financial costs and risks	Environmental sustainability Market efficiency	Perception changes the weighting of goals. As the HAs need to identify financial resources for the social mission initiatives, the goals are shifted to the allocate resources	Shifts from sustainability to market efficiency
B3	An *increase* in regenerate housing and neighbourhood leads to an *increase* in chances of sustainable design, *increasing* environmental sustainability, which *decreases* gap in environmental sustainability, and *decreasing* regenerate housing and neighbourhood.	Environmental sustainability Design issues	Regeneration provides pilot projects and experience as reference, forming goals in environmental sustainability	Accomplishes goals in environmental sustainability
B4	An *increase* in regenerate housing and neighbourhood leads to an *increase* in housing conditions, *decreasing* gap of housing conditions, which *decreases* regenerate housing and neighbourhood.	Health and well-being	Regeneration demand and feasibility forms goals of the regeneration	Accomplishes goals in health and wellbeing

B5	An *increase* in regenerate housing and neighbourhood leads to an *increase* design fitting people needs, *decreasing* housing problems such as overcrowding issues, *increasing* resident satisfaction of the properties, which *decreases* concerns of potential reputation risks, *decreasing* housing, health and wellbeing goals, *decreasing* gap of housing conditions, and *decreasing* regenerate housing and neighbourhood.	Health and well-being	Concerns of the potential reputation risks increases forming goals in health and wellbeing	Accomplishes goals in health and well-being
B6	An *increase* in regenerate housing and neighbourhood leads to an *increase* in disturbance to residents and community, *increasing* potential social rented residents moving out, *decreasing* number of people benefiting from regeneration, *decreasing* community support for regeneration, which *decreases* regeneration viability, *decreasing* regeneration demand and feasibility, and *decreasing* regenerate housing and neighbourhood.	Health and wellbeing	Disturbance to the local community potentially decreases the preference of regeneration option	Decreases preference in regeneration option
B7	An *increase* in regenerate housing and neighbourhood leads to a *decrease* in demanded repair costs, *decreasing* regeneration of housing and neighbourhood.	Health and well-being (housing conditions) Market efficiency	Consideration of accumulative long-term repair relevant to bad housing conditions costs forms the option of regeneration	Shifts attention from health and well-being to financial viability
B8	An *increase* in regenerate housing and neighbourhood leads to an *increase* in rent income loss during regeneration, *decreasing* regeneration financial performance, and regenerate housing and neighbourhood.	Market efficiency	Rent income loss during regeneration potentially decreases the preference of regeneration	Decreases preference in regeneration option

5.7 Discussion and conclusion

Grounded in the case study of an English HA and the regeneration projects in different stages, this chapter conceptualised the dynamics in decision-making through a systems perspective. This section describes our main contributions.

5.7.1 Contribution to urban regeneration research

Research suggest that there are increased risks of mission drift when there are multiple demands (Ebrahim et al., 2014; Ometto et al., 2019). In urban regeneration, long-standing debates include those focused on local tensions (Slawinski et al., 2019), implications in energy efficiency (Crawford et al., 2014; Power, 2010), and risks of gentrification and the displacement of social problems (Arthurson et al., 2015; McCartney et al., 2017). Considering the mixed evidence regarding health and sustainability in urban regeneration (Thomson & Thomas, 2015), it is critical to understand how to sustain decision-makers' attention towards sustainability and health and well-being aspects throughout a project.

As illustrates in Figure 5–14, this chapter identified seven types of decision-making topics in regeneration projects were identified. It was found that the two logics: social mission versus market, predominantly compete for the decision-maker's attention while closely connect with each other. The dominance of the focus shapes to what extent that community engagement, housing design, policy compliance, and operational management issues are pro-social or pro-market.

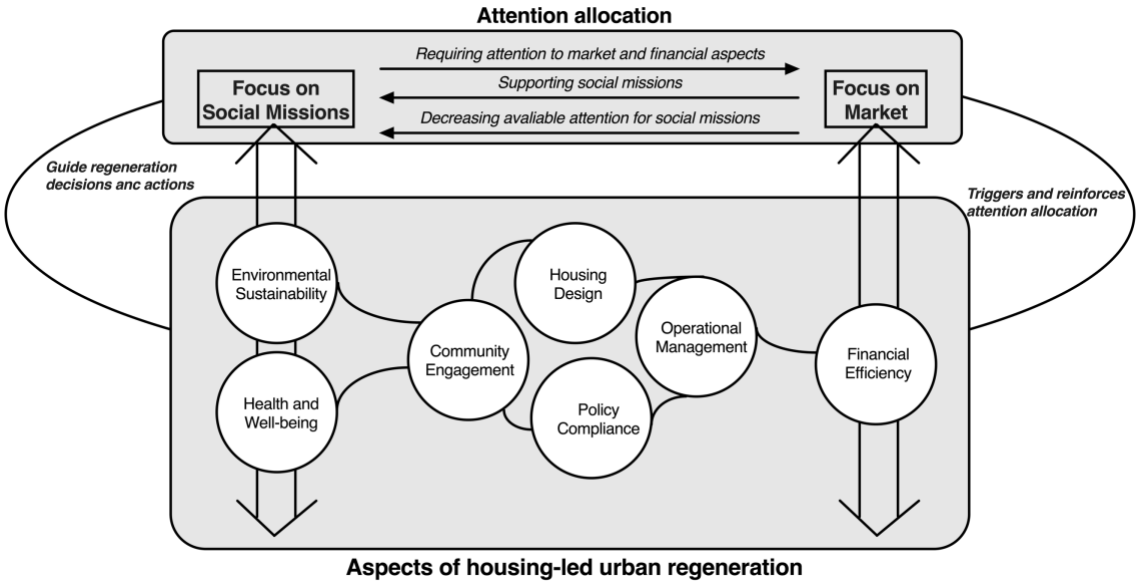


Figure 5–14: Interconnections between attention allocation and urban regeneration

This chapter contributes to the conversation by suggesting two layers related to the risks of mission drift in regeneration projects. Firstly, considerations concerning financial

performance trigger attention towards financial costs and risks, which cascade into attention competition. The balancing links between attention to a social mission and financial costs and risks indicate that there are significant risks of mission drift if the dominance of the attention focus shifts to the financial side. Specifically, perceptions of sustainability as expensive and an extra can increase the HA's attention to financial costs and efficiency, leaving sustainability issues outside of central conversations.

Secondly, there is a paradoxical competition between attention to health and sustainability. While attention to health and sustainability are closely linked, the attention trigger is different and there is internal competition between the two attention topics. As a result of the HAs' historic grounding in social purpose, consistently shifting the emphasis towards finance or health can potentially drive attention away from sustainability. When the organisation structures and routines are developed around health and well-being, unless sustainability benefits can be perceived, there is a risk that attention to health will not transfer to sustainability. Moreover, it might even compete with attention to sustainability topics as sustainability issues are viewed as less important.

In contrast to the theoretical framework that states that there are exogenous “guardrails” for each logic that constrain decision-making (Smith & Besharov, 2019), the findings show attention allocation to be an endogenous process through which the contradictory yet interrelated elements constrain each other. While top-level ownership and policy present as powerful stimuli, it is the structural tensions that contribute to the persistency of complexities in decision-making.

To sustain attention on the social mission, it is, thus, critical to recognise the attention competition and attention-shifting process, especially for sustainability initiatives that are not channelled into formal organisational structures. While attention to health and well-being and sustainability both paradoxically rely on the market logic to provide financial resources, information and judgements seem to substantially impact attention to sustainability topics when they are not embedded in existing organisational structures. From a systems perspective, ensuring a stable inflow of attention to each subcategory of the social mission and noting the consequences of attention shifts for balancing mechanisms can be critical to sustaining attention to sustainability.

5.7.2 Contribution to systems perspectives in decision-making theories

Research into housing management focuses on the developers' capacity and resources, the influence of political agendas and policies, or the assessment and economic analysis of housing interventions (Huang et al., 2020; Wang et al., 2021); however, they rarely

mention how decision-making and place-making systems interconnect. This study contributes to the research regarding integrated decision-making in the built environment, which considers the overall complexities of managing places (Macmillan et al., 2016; Slawinski et al., 2019).

The feedback structures demonstrated the importance of employing both physical and tangible resources (places, activities, and interventions) and intangible and cognitive resources in decision-making. By mapping connections, the CLD revealed the potential consequences of a dominant logic shift when sustainability and health are not given the same weight in attention allocation.

This chapter shows that learning and knowledge building can be critical in directing cognitive resources. Top-down stimuli, such as funding and planning policies, can increase attention to financial efficiency topics, triggering attention competition, which can alter decision-makers' perceptions of the relevance of the social mission and knowledge building. In contrast to recent findings that identify financial gaps rather than knowledge gaps as the main barriers to promoting healthy urban development (Pineo & Moore, 2021), the result found that experience in previous projects was frequently mentioned in project meetings, indicating the importance of building knowledge and learning in healthy urban development in HAs. However, we must be aware that attention to topics does not necessarily translate into experience and knowledge (Ocasio et al., 2020). Thus, it is critical to understand how decision-makers selectively build knowledge in the face of a paradoxical attention structure.

5.7.3 Contributions to qualitative system thinking methods

While much research is focused on institutional complexities and their dynamics (Santos et al., 2015; Smith & Lewis, 2011; Weiser & Laamanen, 2022), theories and tools for explaining structural dynamics are limited. This study used systems tools to theorise the management of competing attention issues and logics. By focusing on the causal relationships in the coding process (Eker and Zimmermann, 2016), a qualitative analysis method was developed to generate (1) causal mechanisms, (2) change-over-time graphs of the meeting topics, and (3) and feedback loops to explain the behaviours of the system. This chapter demonstrated the use of qualitative concepts and causal mechanisms to explain the change-over-time patterns of the focus problem. The integration method is a promising approach with which to explore complexities and systems behaviours in organisations.

5.8 Limitations and next steps

5.8.1 Limitations

Although this chapter generated in-depth theoretical insights into decision-making dynamics in urban regeneration projects led by an English HA, the findings and model are based on a single case study. Interviewees were chosen because they worked on the housing regeneration project, and their positions covered many but not all organisational areas. In future research, further grounding in different HAs, departments, and/or organisations in a different social service organisation would act to clarify how general the system model proposed herein is in terms of explaining institutional complexity in housing associations and hybrid organisations.

Furthermore, the categorization of first-order codes was entirely conducted by me without validation from other coders. While the use of grounded theory heavily stressed the importance of deep understanding of the underlying patterns and linkages between codes, future studies could enhance the coding guidelines by incorporating more specific and broader social determinants of health, which would contribute to an overall improvement in the coding.

Also, emerging built environment research demonstrates that participatory GMB workshops can facilitate decision-makers' understanding of complex interactions and support a systems perspective (Macmillan et al., 2016; Sharpe et al., 2018).

5.8.2 Next steps

The research suggests several next steps. Firstly, although the CLD explains the interconnections between the regeneration outcomes and decisions, which partially explained the systems functions, it is not clear what interventions are necessary to sustain the attention to health, wellbeing, and sustainability. The fist next step is to develop the simulation model into a simulation model, replicating the attention allocation patterns observed and providing strategies. Further drawing from institutional complexities theories, CHAPTER 6 and CHAPTER 7 continue explores the tensions in decision-making when decision demand contest with each other.

Secondly, this research suggests that policies related to urban regeneration strongly influence the goals and objectives within regeneration projects; however, it is not fully clear how policies should be designed to motivate decision-makers to integrate more health, wellbeing, and sustainability considerations in their decision-making. The second next step is to investigate how systems perspectives can be used to support policy-making that considers the regeneration complexity. CHAPTER 8 addresses this step.

CHAPTER 6

Managing competing institutional logics within decision-making

6.1 Introduction

As introduced in the methods chapter (see section 4.2), this research was predicated upon the idea that decision-making is bounded, focusing on individuals' cognitive attention (Ocasio, 1997). While the theory of ABV supports identifying the attentional patterns, as presented in CHAPTER 5, it did not sufficiently explain how to manage the complexities of managing competing demands. A main insight from CHAPTER 5 is that the contradictions within institutional dynamics impact urban regeneration outcomes. The findings aligned with research regarding HAs which has highlighted the impact of competing demands resulting from plural logics (Jacobs & Manzi, 2020; Manzi & Morrison, 2018; Morrison, 2016; Sacranie, 2012). Specifically, the competing demands (market focus versus social mission) are closely intertwined with each other, influencing decision-making regarding a range of issues, such as housing and neighbourhood design, community engagement, investment, and sustainability and health. The result has demonstrated that attention is allocated based on the competing demands within decision-making. Most importantly, the failure to understand the complexity can render the social mission outcomes (building more affordable and decent homes and benefiting the most vulnerable population) uncertain.

Institutional logic is a socially constructed principle that organises institutional practices within social systems (Friedland & Alford, 1991; Thornton et al., 2012). It forms norms, values, and beliefs that structure the cognition of actors in organisations, shaping a group's understanding of strategies and formulating decisions (Thornton, 2002), providing guidelines for organisational members to interpret and function in social situations (Greenwood et al., 2011), and shaping the organisation's actions and outcomes (Thornton & Ocasio, 1999).

The aim of this chapter is to explore how to conceptualise the underlying dynamics of competing demands. This chapter reviews the theoretical framework of managing competing demands and tensions, posing the following questions:

- What are the characteristics and consequences of managing competing institutional logics?

- What structures contribute to the persistent challenges involved in managing competing logics in organisational settings?

This chapter summarises theoretical explanations of how decision-makers and organisations approach decisions in response to competing and contradictory needs in organisational settings. Theoretical models are then redeveloped based on the existing literature, using CLDs to highlight the interconnections and complexities between decision-making factors. Finally, the interconnections and structures that drive the competing demands within decision-making are highlighted.

6.2 Institutional perspectives on managing competing decision demands

This section summarises the theory of institutional complexities.

6.2.1 Institutional complexities

Friedland and Alford (1991) described institutional logic as institutional orders of society, including capitalism, family, bureaucratic state, democracy, and Christianity. Thornton et al. (2012) further developed the typology to include seven institutional orders at the level of industries or fields, namely family, religion, state, market, profession, corporation, and community. The field level refers to organisations that recognise areas of institutional life. Each institutional logic is 'socially constructed, historical pattern of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce the substance of their materials, organise time and space, and provide meaning to their social reality' (Thornton & Ocasio, 1999, p. 804). As illustrated by the case of the higher-education industry (Thornton, 2004; Thornton & Ocasio, 1999), multiple institutional logics develop at the level of institutional fields. Industry- or field-level logics can be embedded in societal-level logics and can be influenced by field-level processes of generating distinct forms of 'instantiation, variation, and combination of societal logics' (Thornton et al., 2012).

Institutional logic delineates the rules, norms, and routines that shape the decision-maker's cognition within organisations (Powell & DiMaggio, 1991). The implicit rules within the institutional logics regulate the valuation and legitimisation of the issues within their environment. Institutional complexity refers to signals and pressures stemming from multiple institutional logics (Greenwood et al., 2010). The complexity perspective focuses on how different logics relate to the societal and institutional orders in providing distinct meanings and practices and the consequences of heterogeneity in social contexts.

6.2.2 Institutional contradictions

HAs, social entrepreneurship, non-profits, and public or private organisations attempting to integrate social missions into businesses are called ‘hybrids’; these actors are critical in addressing societal challenges, such as providing affordable housing and health services in a contemporary welfare landscape (Billis, 2010). Two distinct institutional logics pose a problem for these organisations: social mission logic, which urges organisations to invest in social aims and products, and market or business logic, which instructs decision-makers to consider financial viability and competitive pressures (Battilana & Dorado, 2010; Vickers et al., 2017).

Incompatible prescriptions characterise tensions and conflicting demands from multiple institutional logics (Greenwood et al., 2011). Contesting demands can pressure organisations to prioritise goals (Holt & Littlewood, 2015). The presence of competing or multiple logics can produce potential opportunities for positive institutional changes (Micelotta et al., 2017; Ocasio et al., 2015). For example, combining cultural production and manufacturing logics can yield new opportunities to innovate product design (Dalpiaz et al., 2016). New practices can be institutionalised as a new single logic linked with the existing organisational routines (Maguire et al., 2004; Rao et al., 2000).

Consequences can also be created from institutional contradictions. At the organisational level, the existence of multiple actors or goals could result in ambiguity and inconsistent decision-making patterns within organisations (March, 1994). Internal tensions induce changes in prevailing strategic and structural logics (Thornton, 2002) and destabilisation at the field level (Cappellaro et al., 2020). Texts such as authoritative texts can impact individuals’ perceptions of prevailing institutions and the formation of counter-identities (Chreim et al., 2020). For example, when hybrids or social enterprises combine both charity and business forms within their core activities, there are potential risks of the organisation drifting toward the business form and away from their social missions (Ebrahim et al., 2014). The risk of losing sight of their social tasks in their efforts to generate financial revenues has been referred to as ‘mission drift’ (Ebrahim et al., 2014; Ometto et al., 2019).

At a micro level, individuals’ agency in responding to institutional complexity can vary, and multiple logics can result in individual actors’ divergent interpretations of the organisational prescriptions (Martin et al., 2017). Pache and Santos (2013) proposed an individual-level response model suggesting that individuals' perceptions of logics influence how they contribute to institutional changes and adaptations. Bertels and

Lawrence (2016) indicated that high levels of environmental surveillance and performance gaps triggered individual sensemaking for practical actions, reinforcing the notion that environmental stimuli are critical for individual agency. Furthermore, competing tensions can trigger organisational complexities that are not easy to observe (Child, 2020; Pache and Santos, 2013). Conflicting logics can amplify differences in subcultural values, assumptions, and beliefs, rendering institutional logics even more internally incompatible (Kok et al., 2019).

6.2.3 The impact of institutional complexity on attention allocation

As decision-makers have limited abilities, only selective issues are attended to (Ocasio, 1997). Institutional logics influence decision-makers' focus of attention by changing the availability (knowledge and information that can be used in cognition), accessibility (knowledge and information that comes to mind), and activation (knowledge and information that are used; Thornton et al., 2012) of certain information. The changes within organisation architectures influence how organisational actors attend to issues (Crilly & Sloan, 2014). Also, the shifts in complex institutions rely on individuals' observations, interpretations, and decisions (Greenwood et al., 2011). Consequently, institutional logic moderates the attention of organisations in making strategic decisions. For example, shifts in different stakeholders' power and influence are linked with the focus of corporate accountability (Morf et al., 2013).

Additionally, according to Thornton and Ocasio (1999), prevailing institutional logics shape the legitimacy of various sources of leadership, power, and authority in organisations. Using the example of the higher education publishing industry, Thornton and Ocasio (1999) demonstrated that the shift from editorial to market logic resulted in the executive attentional shift from focusing on author–editor relationships and internal growth to focusing on resource competition and acquisition growth. In summary, institutional complexity challenges the allocation of attention (Greenwood et al., 2011), and the prevailing, established, or dominant institutional logics can potentially direct most attentional resources.

6.3 Theoretical models of managing competing demands

This section summarises four existing theoretical lenses and redevelops the theoretical models in CLDs. The aim is to generate structural-level insights into why the competing demands within decision-making persist and how to shift the dominance of the prevailing logic in directing attentional resources.

6.3.1 Model 1: Achieving social and business missions

The tensions between social and business is a focus within the hybridity literature, which argues that the two logics compete with each other (Battilana, Lee, et al., 2012). Smith and Besharov (2019) proposed a model and argued that the social-versus-business tensions embedded in hybrid organisations can be managed through the 'structured flexibility constrained by the two guardrails'. Specifically, 'guardrails' refer to an aggregation of 'expertise, external relationships, and formal structures that eventually came to serve as stewards of their social and business missions' (p.13). In the model, the 'stewards' of the business mission raise concerns when drifting far to the social mission side, acting as a guardrail. The model explains that the guardrail between social missions and business missions constrains the competition. Through the 'bumping against the guardrail' process, the business's financial and operational viability is ensured. The competition between contrasting demands is explicitly demonstrated through the exploration of guardrails and stewards.

The model is redeveloped using CLD, as illustrated in Figure 6–1. The model includes two reinforcing loops. The increasing *confronting strategic tensions* will intensify the *demand to reinterpret identity meaning, interpret identity meaning*, and *experiment with practices*. This mechanism can have two results: Firstly, it increases the *achieving social mission*, which prompts more social mission conversations regarding strategic tensions, yielding reinforcing loop ***R1 Growth of social mission***; secondly, it increases the *achievement of the business mission*, which prompts more business mission conversations regarding strategic tensions, resulting in reinforcing loop ***R2 Growth of business mission***. In this model, the competition occurs persistently, and the dominance of loops might shift depending upon which guardrail is more powerful.

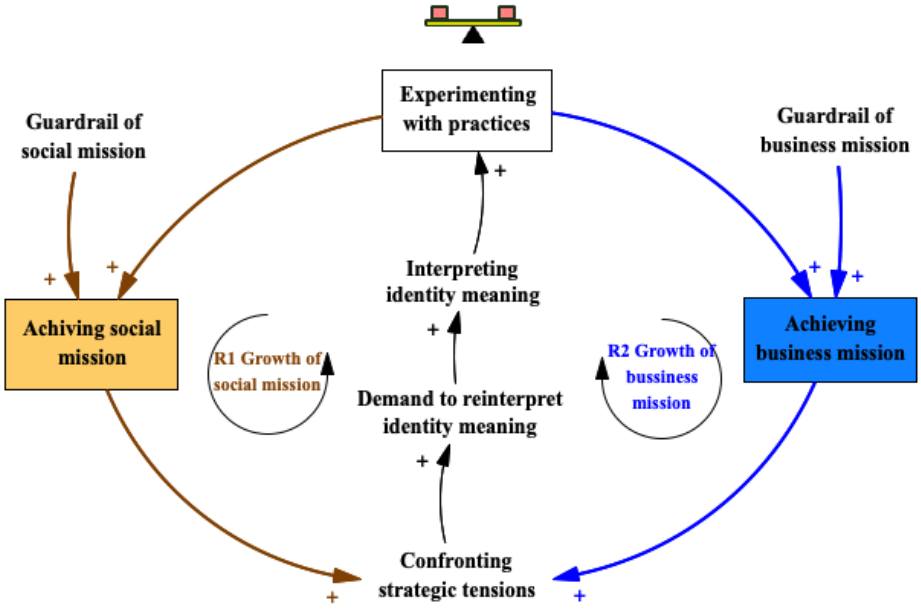


Figure 6–1:A CLD model of sustaining hybridity through structured flexibility, adapted from Smith and Besharov (2019).

The model implies the importance of strategic debates and confrontations regarding the growth of dual missions. The reason is that iterative interpretations of organisational identity require conversations between leaders, resulting in changes in strategic visions. Similarly, the ABV literature also suggests that formal structures (such as *experimenting with practices*, as shown in the model) are essential channels to direct organisational attention. For example, one approach for organisations to address institutional contradictions is to decouple organisations' channels (Ocasio, 2012), which will re-situate the availability, accessibility, and activation of individual attention (Thornton et al., 2012).

6.3.2 Model 2: Combing competing logics

The second model focuses on how organisations combine institutional logics to pursue new opportunities. Dalpiaz et al. (2016) draw from agency theory to argue that institutional logics are not primarily imposed on organisations but can be updated when organisations update their beliefs and expectations (Pache & Santos, 2013b). Rather than focusing on a set of specific competing logics, Dalpiaz et al.'s (2016) model aims to unravel how organisations can combine multiple competing logics to create new market opportunities, highlighting another theoretical alternative to the systems approach of managing competing demands.

Figure 6–2 illustrates that the model through three essential loops. Firstly, *recombined strategies and resolutions* refer to explicit decisions about the competing logics (logics of industrial manufacturing and cultural production) and the applications to organisational activities. The increase in recombined strategies and solutions results in *symbolic rearrangements from different logics*, which refers to changes at the strategic and guiding principles level. It then generates *new goals and strategies* and encourages the organisation to *experiment with new products and audiences* and *search for opportunities through product innovation*, and it yields new *reflections* about the business's legitimacy, forming the first reinforcing loop ***R1 product innovation***.

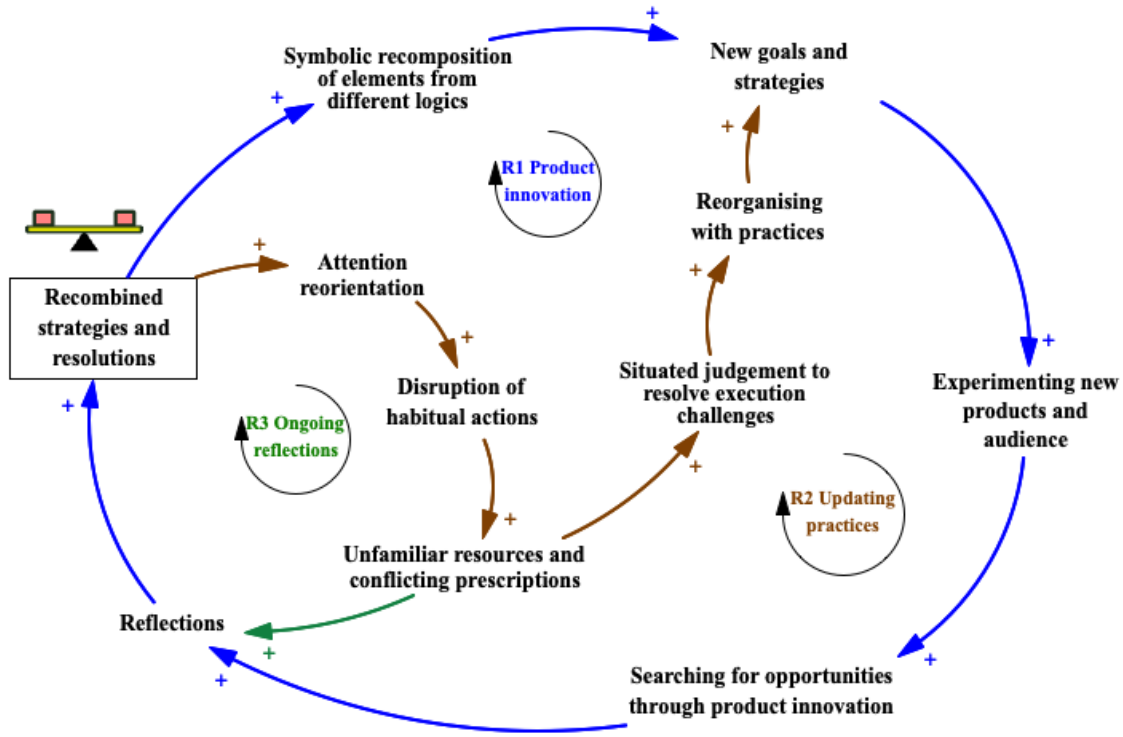


Figure 6–2: A causal model of combing logics for the pursuit of new market opportunities, adapted from Dalpiaz et al. (2016).

Secondly, *recombined strategies and resolutions* lead to attention re-orientation in organisational practices, which induces *disruptions in habitual actions*, shaping reflections and future goals. 'Disruptions' implies that organisational members need to make pragmatic decisions based on their *situated judgement*, which *reorganises practices*, contributing to the new goals and strategies. This mechanism forms the second reinforcing loop ***R2 Updating practices***.

Lastly, the *attention reorientation* and disruption emerged at the cognition level, increasing the *reflections* about future goals and amplifying the recombing strategies and

resolutions to improve products and practices, which helps to establish 'a sense of continuity with future actions' (p375), thereby forming the reinforcing loops ***R3 Ongoing reflections***. Dalpiaz et al. (2016) suggest that recombing strategies and resolutions are foundational to manage competing demands. As shown in the model, the disruptions arising from competing demands engender new opportunities for the organisation to replace conventional practices and products at both practice and cognition level.

6.3.3 Model 3: Sustaining attention to events

When coexisting issues demand decision-making, they compete for attention and resources at the organisational level. The third model drew a more explicit link to attention perspectives. The model by Hoffman and Ocasio (2001) presented the changes in industry attention when external events occur. The model is redeveloped in Figure 6–3.

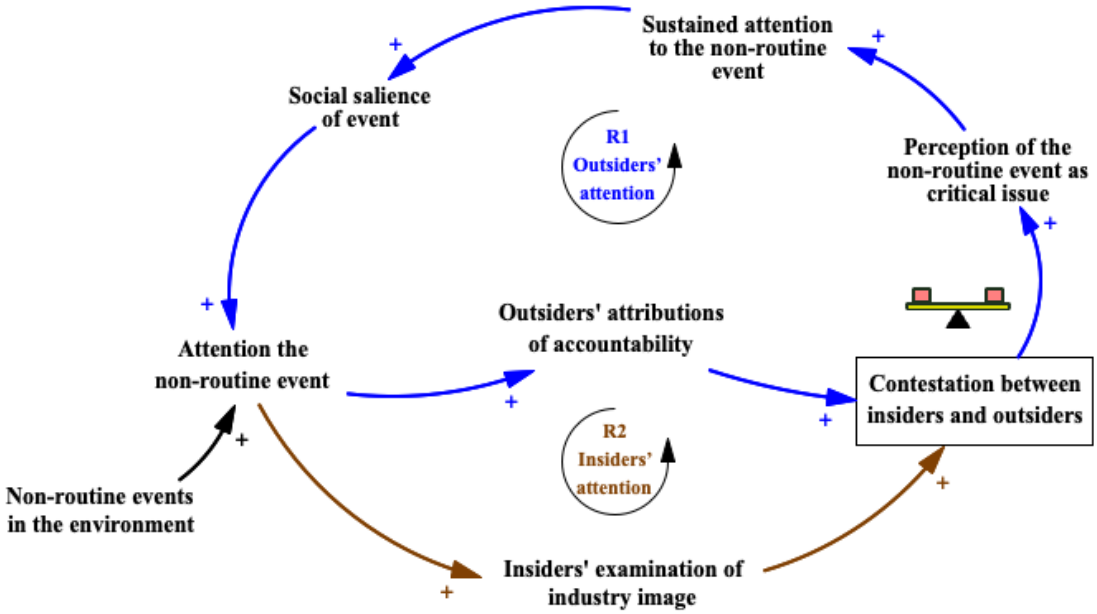


Figure 6–3: A causal model of the industry's attention to external events, adapted from Hoffman and Ocasio (2011).

In the model, when the *non-routine events*, which depart from the industry's conventional business and responses, are recognised as important, the events capture the industry's *attention to the non-routine event*. The model highlighted the role of *contestation* enactments when outsiders and insiders from the industry have different perspectives regarding the issue. In this sense, attention triggers *outsiders' examinations of industry images* and *insiders' attributions of accountability*. Outsides can hold insiders from the industry accountable. The *contestation between insiders and outsiders* increases the *perception of the non-routine event*, which increases *sustained attention to the non-*

routine event and *the social salience of the event* as a result. Social salience refers to the prominence or importance of a stimulus in relation to a particular social context. As the social salience increases, increasing *attention* from both insiders and outsiders is directed toward the non-routine event, forming two reinforcing loops: ***R1 Outsiders' attention***, and ***R2 Insiders' attention***.

The models suggests that while the non-routine event in the environment is only an exogenous trigger of the attention initially, the attention can be sustained endogenously through the contestation between different groups of people. The reinforcing nature of attention also intensifies the salience of the event, which can trigger bottom-up channels of attention. Another attention model from Shepherd et al. (2017) describes environmental change as an exogenous factor that shapes the managers' formation of opportunity-related beliefs. On the other hand, Blettner et al. (2015) is more explicit regarding the feedback view by highlighting that organisational attention and experience will inform learning and the further allocation of attention.

6.3.4 Model 4: Recurring tensions

The last model was developed by Smith and Lewis (2011), who explained why tensions from competing demands are persistent. Tensions form when there are two opposing poles, namely A and B. *Accommodate A and B* refers to finding the synergies between the two poles. *Choose A* and *choose B* both increase the detection of the synergies, which increases *paradoxical resolutions*, as Figure 6-4 illustrates. Paradoxical resolutions are decision-makers' approaches toward splitting and integrating responses and transforming the *latent tensions* to salient tensions when cognitive efforts accentuate the oppositional and relational nature of dualities, which is referred to as *attention to tensions and resource competition* in the model.

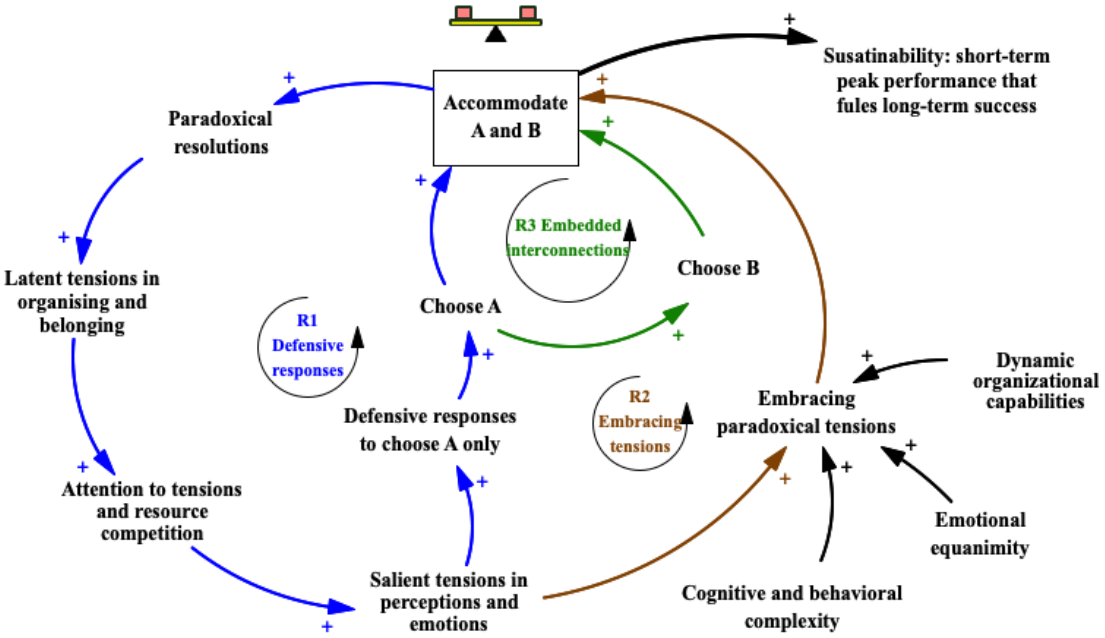


Figure 6–4: CLD of recurring tensions, adapted from Smith and Lewis (2011)

When there are *salient tensions*, two loops are presented. Firstly, the salient tensions can lead to *defensive responses to choose A only* when the decision-makers are overwhelmed by the complexity or are afraid. This pathway can trigger a reinforcing loop ***R1 Defensive responses*** when the decision-makers consistently mitigate the tensions by choosing one response only. In the meantime, the model proposed that alongside the *cognitive and behaviour complexity*, *emotional equanimity*, and *dynamic organisational capabilities*, the decision-maker can *embrace paradoxical tensions*, meaning the acceptance of tensions and finding synergies between the tensions. This mechanism forms the second reinforcing loop ***R2 Embracing tensions.*** Finally, the model proposed that when decision-makers *choose A*, they will increasingly *choose B* because the two depend on one another, generating the third reinforcing loop ***R3 Embedded interconnections.***

The model indicates that as R1 and R3 are directly connected, the competing demands persistently conflict with each other and create cyclical responses over time. Additionally, R2 positively embraces the tensions and suggests that the resolution and responses will induce more latent tensions, forming persistent demands to accommodate A and B.

The model is grounded upon paradox theory. Paradoxes are contradictory yet interrelated elements that persist over time (Smith & Lewis, 2011). In this theory, competition means not choosing one of the institutional demands but managing the contrasting yet inter-connected demands. This theory also contributes to the synergy of the system, as it highlights the importance of understanding why competing issues depend on each other

(Smith & Lewis, 2011). Soderstrom and Heinze's (2021) model of sustainable business also suggests the significance of a cyclical reinforcing mechanism between tensions and solutions in enabling organisational growth and success. In this regard, organisations must embrace competition to increase performance in the face of conflicting demands.

6.4 Towards a systems approach to modelling tensions in decision-making

This section summarises theoretical insights based on representing the theoretical models in CLDs.

6.4.1 Summary of theoretical perspectives

Firstly, model 1 and 4 focused on the hybrid nature of institutional logics that are embedded in decision-making. Overall, the institutional theory assumes that decision-making is bounded by a lack of information or perception of information from institutional logic, which refers to individual or organisational rules and beliefs. This highlights actors' different perceptions and interpretations of decision issues. The models demonstrated that the individuals' integration and differentiation are possible but that they challenge the organisations' decision-making, rendering the space of conflict and negotiations critical in influencing decision-making.

Secondly, models 2 and 3 focused on the attention-related perspectives. The models viewed attention as a corporate asset that determines which issues will prevail in the strategic agenda. The attention-related perspectives are predicated upon the bounded rationality perspective and highlight the limitations of information processing capacity and attention as a resource. The models shows that the attention can be sustained through confronting and resolving tensions and transforming nonroutine events into events with increasing salience in decision-making. The models also indicate that bounded rationality and ABV must be captured, as they form a basis for a systems-thinking approach by highlighting that attention is a limited resource.

Thirdly, model 4 sheds light on the paradoxical nature of the competing demands within decision-making. The institutional approach gives rise to the paradox theory, which emphasises the strategic linkages between opposing but coexisting institutional logics. The changes and shifts in the prevailing logic become the focus issue in decision-making, and managers' responses in accepting, accommodating, integrating, or differentiating the logics influence their strategic decisions. Paradox theory suggests that organisations need to balance the need for stability and change to survive and thrive. Instead of viewing competing logics as disparate and dialectical, the paradox theory views them as interconnected. Figure 6–5 describes the connections between multiple theories.

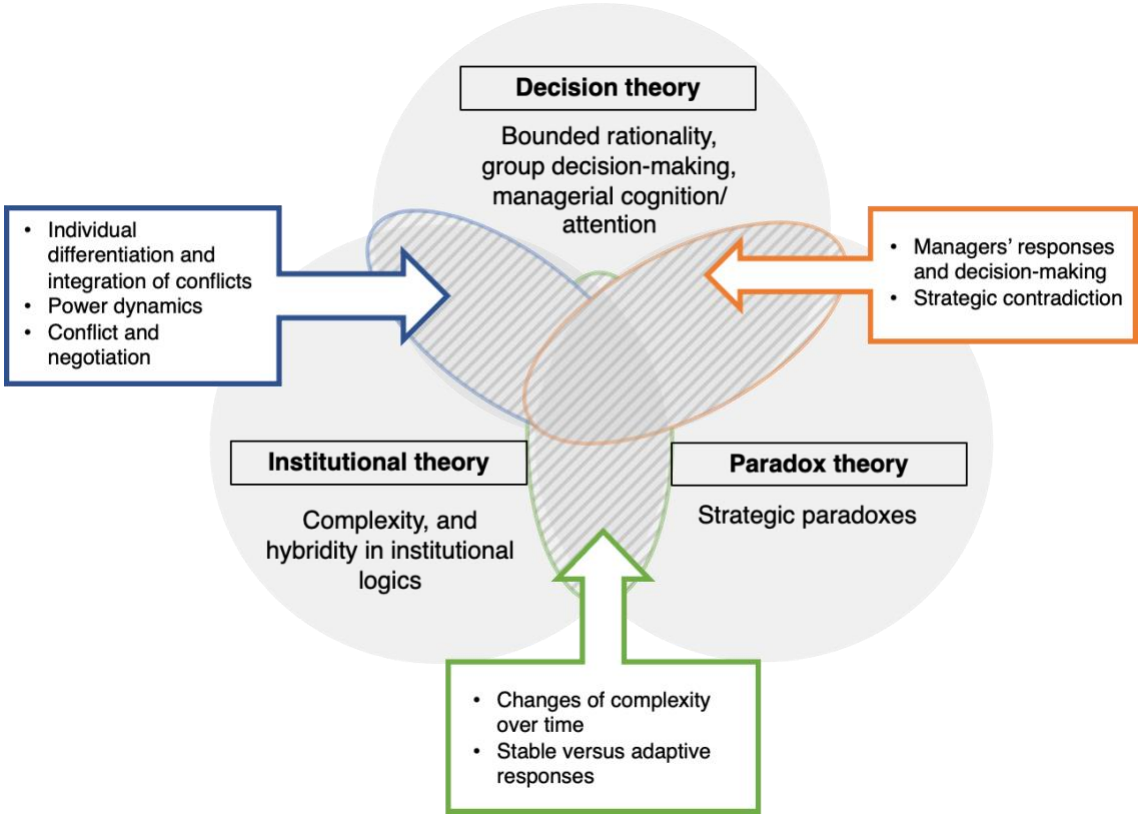


Figure 6–5: Theoretical components relevant to competing demands

6.4.2 Summary of structural characteristics

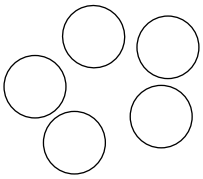
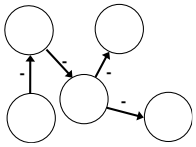
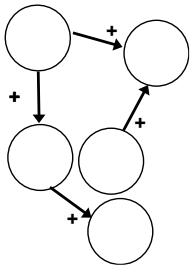
The theoretical models provide an initial understanding of the causal mechanisms underlie institutional complexity, focusing on the logics' tensions, contradictions, and interactions. Several key structural characteristics have been highlighted:

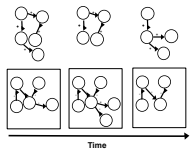
- ***Multiplicity***. The presence of plural and multiple institutional logics is the literature's first and most described aspect of institutional complexity. The presence of multiple logics can be received differently by individuals.
- ***Contradictions***. Contradictions commonly arise when many institutional logics require the attention of the decision-makers. Strategies that focus on compartmentalisation, isolation, contestation, or conflicts of logics are based on the assumption that the logics contradict with each other.
- ***Interrelatedness***. Institutional logics is linked in that decision-makers must attend to the issues due to the coupling of logics. Strategies focused on the co-existence, combining, and blending of logics are based on the assumption that the logic cannot be dealt with separately.

- ***Persistence***. Despite the insights gained in managing and responding to the institutional complexity, it has been highlighted that the contradictions and tensions persist, and ongoing responses are needed.

Table 6-1 summarises the key characteristics identified in the CLDS and within supporting studies from the broader literature.

Table 6-1: Characteristics of institutional complexity: definitions and supporting studies

Complexity characteristics	Definitions	Managerial responses	Sample studies
Multiplicity 	The presence of multiple logics, including dominant and non-dominant ones.	Responses vary in receptivity to different logics. Heterogeneity of institutional logics	Nonmarket logics (regional state logics, and family logics) influence organisations' market behaviours (Greenwood et al., 2010) Impact of organisational culture on the customers' logic and community logic in the HA (Sacranie, 2012) The co-occurrence of market and pro-environmental logics create opportunities for the entrepreneurial entrants to survive in the market (Vedula et al., 2022)
Contradictions 	The combinations of elements that are opposed or contested to one another. The components can be logical when considered in isolation but irrational, inconsistent, or absurd when juxtaposed.	The trade-off (choose to focus on one element or the other) Compartmentalisation or isolation of logics Contestation and conflicts	Actors selectively pick elements from different logics (Meyer & Hammerschmid, 2006) Selectively and purposely enacting with a pool of competing alternatives (Pache & Santos, 2013b) Service-advocacy hybrids compartmentalise logics by creating separate departments (Beaton et al., 2021)
Interrelatedness 	The combinations of elements that are mutually related or connected.	Co-existence, combining and blending of logics	Prioritise and align conflicting objectives and interests to avoid mission drift (Ebrahim et al., 2014) Impact of community logic on filtering the interpretation of broader filed-level logics: state logic and market logic (Lee & Lounsbury, 2015) Combination of the logic of industrial manufacturing and cultural production in

			manufacturing household goods (Dalpiaz et al., 2016). Actors exhibit agency in blending ambiguous logics (professional and policy-driven logic) in organisations (Currie & Spyridonidis, 2016)
Persistence  	The existence of dynamics over a long time; trajectory changes	Employing elastic hybridity which allows organisations to retain competition as both central and incompatible but temporarily decrease the contestation (Besharov & Smith, 2014)	Different diffusion mechanisms in the organisational field could result in different trajectories for each logic and the persistent co-existence of multiple logics (Purdy & Gray, 2009). Practices and actions supported by conflicting logic interact with each other recursively (Purdy & Gray, 2009) Assign responsibility for social and economic activities to distinct groups while creating spaces for members from each group to discuss trade-offs (Battilana et al., 2015) Give different salience to different alternative logics, and fluctuate and move across spatial, temporal, and linguistic spaces (Gümüsay et al., 2020)

6.4.3 Contribution to systems perspectives in decision-making theories

The review of theories and models highlights several findings from a systems perspective that differ somewhat in their focus. Organisations with multiple institutional demands face tensions in legal structures, financing, culture development, and competing desires between customers and beneficiaries (Battilana, Pache, et al., 2012). Tensions could potentially expose organisations to the risk of losing social missions when they focus on other institutional demands, resulting in 'mission drift' (Ebrahim et al., 2014), or creating opportunities for organisations to achieve plural or multiple outcomes (Santos et al., 2015). Decision-making can be a dynamic process wherein organisations must manage competing demands paradoxically and in which the demands co-exist and compete throughout the decision-making. The theoretical models were represented using CLDs, highlighting the systemic lens to understand the underlying structure that produces or alleviates competing demands.

While institutional complexity focuses on the nature of competing dynamics (Smith & Cunha, 2020; Weiser & Laamanen, 2022), minimal tools have shed light on the causal structures that produce persistent challenges and illuminated how to sustain the attention

toward the desired decision-making goals. By representing the theoretical models in CLDs and highlighting the structural characteristics, this chapter contributes to moving towards a systems approach in theorising and modelling tensions in decision-making in the following manner.

Firstly, tensions and competition can be self-reinforcing loops that produce recurring tensions and cyclical competing demands. Choosing innovative products or traditional customers will increase the power of a particular demand, which can activate reinforcing loops that help build institutional power. Organisational structures and professions can act as 'guardrails' to constrain mission drift, which exogenously mitigates the tensions. It remains unclear whether the attention to tensions will resolve tensions or trigger more tensions. In the context of organisational attention theory, it appears that events and their social salience are seen as exogenous variables, capable of triggering attention-related changes but not considered as endogenous factors (Hoffman & Ocasio, 2001; Shepherd et al., 2017). However, it is worth noting that a critical theoretical proposition suggested by the paradox theory: tensions and competition can produce behaviours, and the competing demands and choices depend on each other endogenously (Smith & Besharov, 2019; Smith & Lewis, 2011).

Secondly, competition dynamics arise endogenously or exogenously, as attention resources are limited. The competing demands manifest on both practical capacity and cognition attention levels. While the consequences of competing demands are unclear, the theoretical models suggest that tensions reorient attention and might be critical for organisations to improve performance. Practical decisions such as hiring, and governance are direct responses to tensions. Nevertheless, it depends on whether the insights and reflections regarding tensions can be applied to redefine strategies and goals (Dalpiaz et al., 2016).

Finally, situated decisions within a temporal tension period are critical to evaluate organisations' responses to competing demands. Whether through defensiveness, synthesis and compromise, or negotiation, individuals' perceptions and responses are essential components of the dynamics within the models' connecting tensions and organisational responses (Cholakova & Ravasi, 2019; Pache & Santos, 2021). Individuals' recognition, perception, and experience relevant to tensions also influence how they will make decisions using situated judgements (Hoffman & Ocasio, 2001; Smith & Lewis, 2011). However, the role of contestation and negotiation in influencing attention reorientation is unclear. The attention theories stress the role of 'contestations' between

actors (Hoffman & Ocasio, 2001), while the paradox theory stresses leaders' and top managers' role in interpreting tensions (Smith, 2014; Smith & Tushman, 2005). For institutional theories, it remains unclear whether negations and contestations around trade-offs are necessary for harnessing selected logic (Battilana et al., 2015) or not necessary to gain legitimacy or acceptance (Pache & Santos, 2013b).

Lastly, the models all indicated that the integration or accommodation is essential in managing competing demands. However, Pache and Santos (2021) argue that attempting to accommodate and compromise institutional demands may also lead to 'detrimental organisational complexity and harmful conflicts' (p.646). According to Pache and Santos (2010), organisations with high levels of fragmentation and centralisation are more likely to be exposed to conflicting institutional demands. Pache and Santos (2010) also suggest that the nature of competing demand matters, as it is easier for institutional referents to negotiate means rather than goals. Thus, the research needs to investigate the consequences of different strategies of mitigating tensions.

CHAPTER 7

A simulation model to conceptualise the management of competing institutional logics

7.1 Introduction

This chapter presents the second part of the findings. The motivation of this chapter was elucidated in CHAPTER 5, which discussed the dynamics of the case study HA's delivery of healthy and sustainable housing in regeneration projects. In practice, the inclusion of health or sustainability goals relies heavily upon financial efficiency (e.g., the availability of funding, economic viability, and a budget). It was found that attention to the social mission was not sustained as the projects proceeded.

In CHAPTER 6, relevant theories were reviewed with the aim to explain how organisations frequently face multiple demands in decision-making. While complexity remains pivotal to institutional literature, researchers have only recently started to explore the intrinsic dynamics of incorporating multiple institutional demands within organisational settings in depth (Pradies et al., 2021; Schad & Bansal, 2018; Tsoukas & Cunha, 2017; Smith & Lewis, 2011). For example, Smith and Lewis (2011) framed these dynamics as a 'vicious cycle' and a 'virtuous cycle'. Vicious cycles can be positive or negative, with a reinforcing dynamic involving defensive behaviours that prioritise one logic over another; virtuous cycles involve accepting strategies and an awareness of tensions (Pradies et al., 2021).

While the dynamics of managing competing tensions appear to be crucial in urban regeneration decision-making, there are two main gaps in the theoretical literature regarding managing competing logics:

- Firstly, it is not clear what the underlying structure contributes to the interactions (e.g., emerge, increase, decrease, and dominate) between logics over time; and
- Secondly, how decision-makers allocate their attention to different issues in the presence of competing needs, which is critical for maximising sustainable and health benefits under financial restraints.

Addressing these gaps is essential, as this will allow us to identify how limited attention has been allocated as well as opportunities to sustain attention to specific logics.

This chapter focuses on the theories and perspectives in the decision-making literature to understand the dynamics of managing contradictory, competing, or conflicting demands. Based on the theoretical models and the qualitative results from the case study HA, a theoretical simulation model was developed to capture the dynamics of attention allocation in the face of competing demands. This theoretical chapter employs systems thinking to investigate the structures (connections and feedback loops) underlying the behaviours of systems (Richardson, 2011; Sterman, 2000). The systems thinking approach can contribute to the management of competing demands in two ways: Firstly, it enables an exploration of the unintended consequences of decision-making when competing issues arise. Secondly, it facilitates the conceptualisation of feedback mechanisms that underlie competing decision demands to provide systems insights (Tsoukas & Cunha, 2017; Wolstenholme, 2003).

This chapter first describes the conceptualisation of the model grounded in the qualitative analysis and the results of the change-over-time patterns of attention allocation. The changes in decision-makers' attention to the different issues addressed in meetings, as presented in CHAPTER 5, are further analysed in this chapter with more details. The simulation model of attention is then presented to explain the attention allocation patterns observed in meetings. Finally, the simulation results are presented to explore strategies to identify approaches to support decision-making regarding achieving social missions.

7.2 Methods

The basis for using theoretical simulation models was outlined in CHAPTER 4, specifically in sections 4.3.3 and 4.5. Following the qualitative analysis and attention pattern generation (step 1~3), simulation modelling (step 4) was conducted to explore the micro-level cognitive dynamics within the group. Figure 7–1 illustrates how the step 4 simulation modelling aggregates the knowledge learned from CLDs (structural dynamics) and the changes in decision-making patterns (attention patterns).

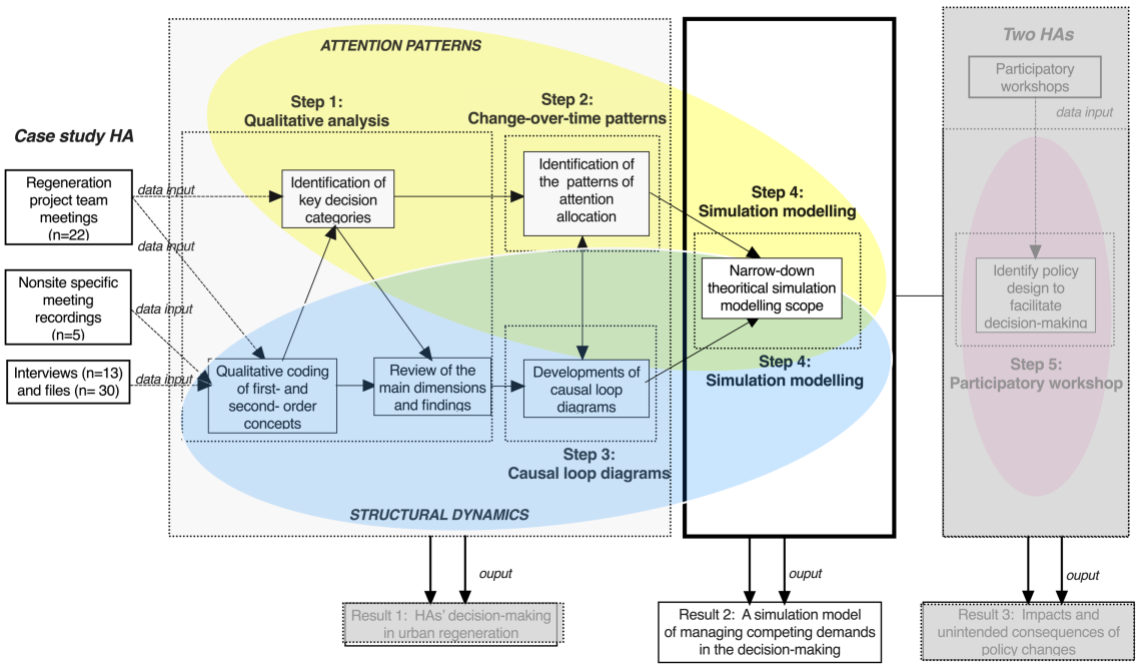


Figure 7–1: Version of Figure 4–4, highlighting the methods relevant to the second part of the findings

Specifically, to develop the theoretical model, several steps were included:

1. **High-level model conceptualisation**. The first step is to identify a conceptualisation of the problem at a high level. The conceptual model and reference modes represent a simplified representation of the simulation model and the behavioural dynamics. Conceptual models are often used in simulations because they can help to identify the key variables and relationships that influence the behaviour of the system or process being studied. Conceptual models can be developed using various methods, such as mathematical modelling, computer simulations, or other analytical techniques. In this research, the conceptual model has been developed based on the insights from CLD (discussed in CHAPTER 5). The aim of a theoretical model is to explore the pivotal factors and fundamental structural dynamics rather than simulating the full system. A crucial step is to identify the core dynamic problem. For this purpose, the overall tensions between social missions and market logic have been used to capture the fundamental challenge in decision-making. Most of the exogenous variables have not been included, such as changes in funding, or policy changes. The attention patterns elicited have been reviewed again to provide the reference modes, with a focus on simplifying the detailed explanations of attention patterns.

2. **Micro-level model development.** The second step involved identifying the micro-level structures that explain the systems behaviours (attention patterns in the meetings). The structures identified in the previous CLD have been included: 1) competing dynamics of attention allocation, 2) self-reinforcing dynamics from traditional routines, and 3) the shifts between the topics. The structures have been reviewed with theoretical perspectives (discussed in CHAPTER 6). In comparison to CLDs, SD simulation models focus on stocks (variables that accumulate over time) and flows (change in stocks). The theoretical modelling focuses explicitly on what triggers the attentional inflows and outflows and the attentional shifts.
3. **Model development and experiments.** The last step entailed simulating the structures identified, testing different scenarios, and analysing the system's resulting behaviours or processes. The model has been simulated to explore attention allocation and has been used to test different scenarios and to explore their potential outcomes in decision-making. Extreme-condition, behavioural sensitivity, and boundary adequacy tests were conducted to build robust and rigorous assessments of the model assumptions (Barlas, 1989, 1996).

7.3 Model conceptualisation from the case study

This section delineates the model conceptualisation and the reference modes.

7.3.1 Primary tensions in decision-making

CHAPTER 5 identified seven types of factors that must be addressed in regeneration; they include health and well-being, environmental sustainability, housing design, policy compliancy, community engagement, operational management, and financial viability and efficiency.

Within the various topics, the opposition between health, well-being, and sustainability (HWS) and financial viability and efficiency was the primary logical tension identified in the HAs' delivery of regeneration projects, which is the key element within the micro-cognitive model. The representation adheres to the literature's categorisation of institutional logics: social mission and market logics (Battilana, Pache, et al., 2012; Ebrahim et al., 2014). Figure 7–2 provides a high-level conceptualisation. This categorisation incorporates the attentional patterns observed in meetings (see 5.4), which revealed that decision-makers prioritised health and well-being topics, particularly in early-stage project meetings but comparatively less in delivery-stage project meetings. In comparison, the market logic remained a relatively high priority throughout both the planning and delivery stages.

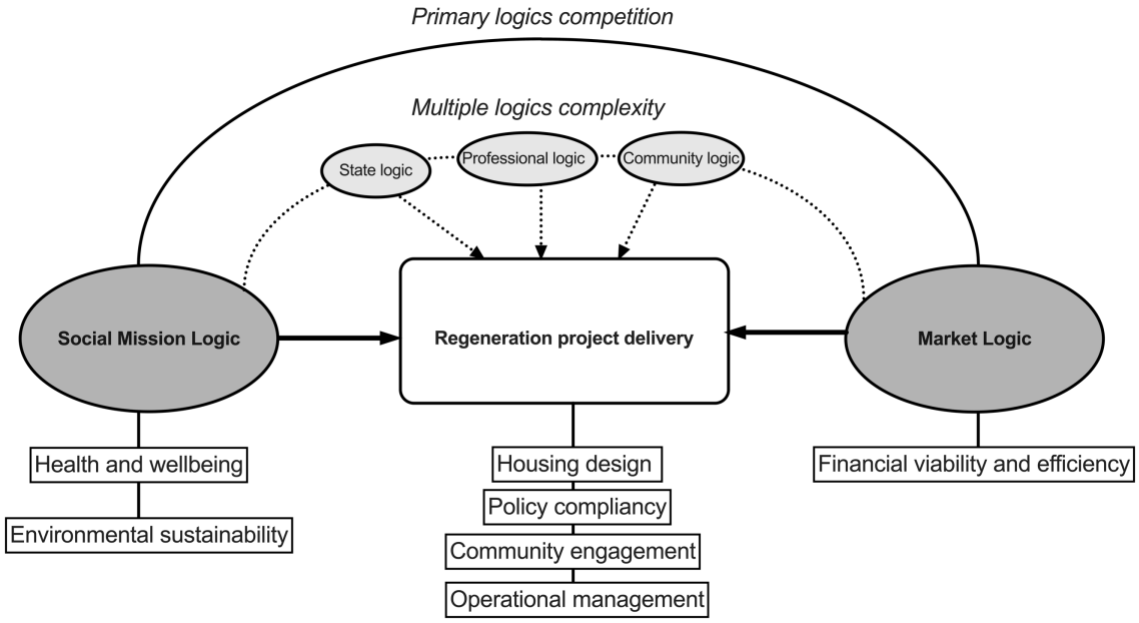


Figure 7–2: Conceptualisation of competition between social mission and market logics in urban regeneration, in relation to decision-making issues identified in Chapter 5.

The conceptualisation model focuses on the primary logical tension. The competition between the two logics impacts other regeneration project delivery activities, including community engagement, housing design, policy compliance, and operation management. Depending on the prevailing logic within the competition between the primary logics, the regeneration project delivery activities would vary. Table 7-1 provides several examples of delivery activities when the prevailing logic differs.

When the social mission dominates in terms of organisational attention, it is likely that decision-makers will devote more attention to resident's needs, such as by tailoring housing design to meet resident's needs, establishing social interventions beyond the policy standards, and incorporating programmes into formal organisational structures. In comparison, when market logic dominates, decision-makers will focus merely on the commercial value of regeneration projects and on meeting the policy requirements related to health and sustainability.

Table 7-1: Examples of regeneration activities with social mission logic and market logic focuses

Regeneration activities	Social mission logic focus	Market logic focus
Community engagement	Residents' interests and approaches to understanding residents' needs	Community engagement with minimal effort to establish project viability in the planning application
Housing design	Building experience and knowledge regarding incorporating health, well-being, and sustainability	Maximise the commercial value of the development
Policy compliance	Establish health and well-being initiatives beyond mandatory policy compliance	For affordable housing and environmental sustainability goals, follow minimum standards where the policy regulations apply
Operational management	Follow well-established routines (formal mechanisms and resources, measurable goals, and strategy directions) through the formal structure to reinforce the idea that healthy housing is at the business's core	External events dictate the perceptions of the importance of issues in operations

7.3.2 Reference mode

The reference mode is a benchmark against which the simulation model can be compared. This section introduces the reference mode that was developed through a review of the attentional patterns in the case study.

7.3.2.1 Role of the agenda

The attention patterns of each regeneration site were reviewed. Figure 7–3 indicates the changes within the attention patterns for each site (the aggregated view of the attentional patterns based on the project timeline was illustrated in Figure 5–3). The further analysis revealed that there are two types of meetings across sites:

- Meetings with prescribed agendas, in which the meeting agenda lists the items, such as updates related to planning progress, community engagement, and design specifics.
- Meetings with an overall agreed-upon meeting focus but no prescribed agenda.

While not all topics triggered sustained attention (for example, the site manager raised questions regarding residential offers and selling issues, but it did not trigger further discussions after the site manager delineated the follow-up plan), the attentional patterns revealed the importance of a meeting agenda. Specifically, the meetings for sites A and

B, which are now in the delivery stage, had agendas that were established in advance. The meeting agenda for sites A and B was dominated by topics related to the project timeline and operational issues; therefore, social goals received minimal emphasis (see the top two boxes in Figure 7–3).

7.3.2.2 Shifts of attention allocation

There was no established agenda for meetings including sites C through G. For meetings with no clear agenda, more shifts in attention to the social mission and market logics were observed, as Figure 7–3 indicates. The shifts can be created when meeting participants pose questions or ask follow-up questions. As an illustration, at one of the site E sessions, while the team was considering the regeneration choices, one member asked a question about policy compliance, bringing up a long conversation about the policy compliancy between meeting participants. The shifts in the prevailing logic were common in pre-planning stage meetings, such as those regarding site E, demonstrating the 'up-and-down' pattern of social missions in which social mission topics eventually regain dominance (see Figure 7–3).

7.3.2.3 Risks of complete dominance

It was also observed in meetings that the topic could completely shift. For example, in site A, for 30 to 35 minutes, attention to social missions increased but then declined rapidly (see Figure 7–3). Attention to sustainability increased when people mentioned the 'energy centre', but no conversations or follow-up questions were identified. This is because the following comment shifted the attention to costs:

> *So we need to look at the enabling work and assume, for example, if we spend on the energy centre, we might spend more on one phase, it's whether we attribute the cost to the phase…In the business plan, it is attached to the cash flow. (Meeting 01, site A)*

Another example was at site F, where the discussion focussed on issues that must be considered to evaluate the regeneration options; one member mentioned how to engage with residents. Although someone mentioned that 'cost is the last thing', the conversations then rapidly shifted to costs related to different options. The conversations may be dominated by social mission topics when there are continuous follow-up activations for the questions.

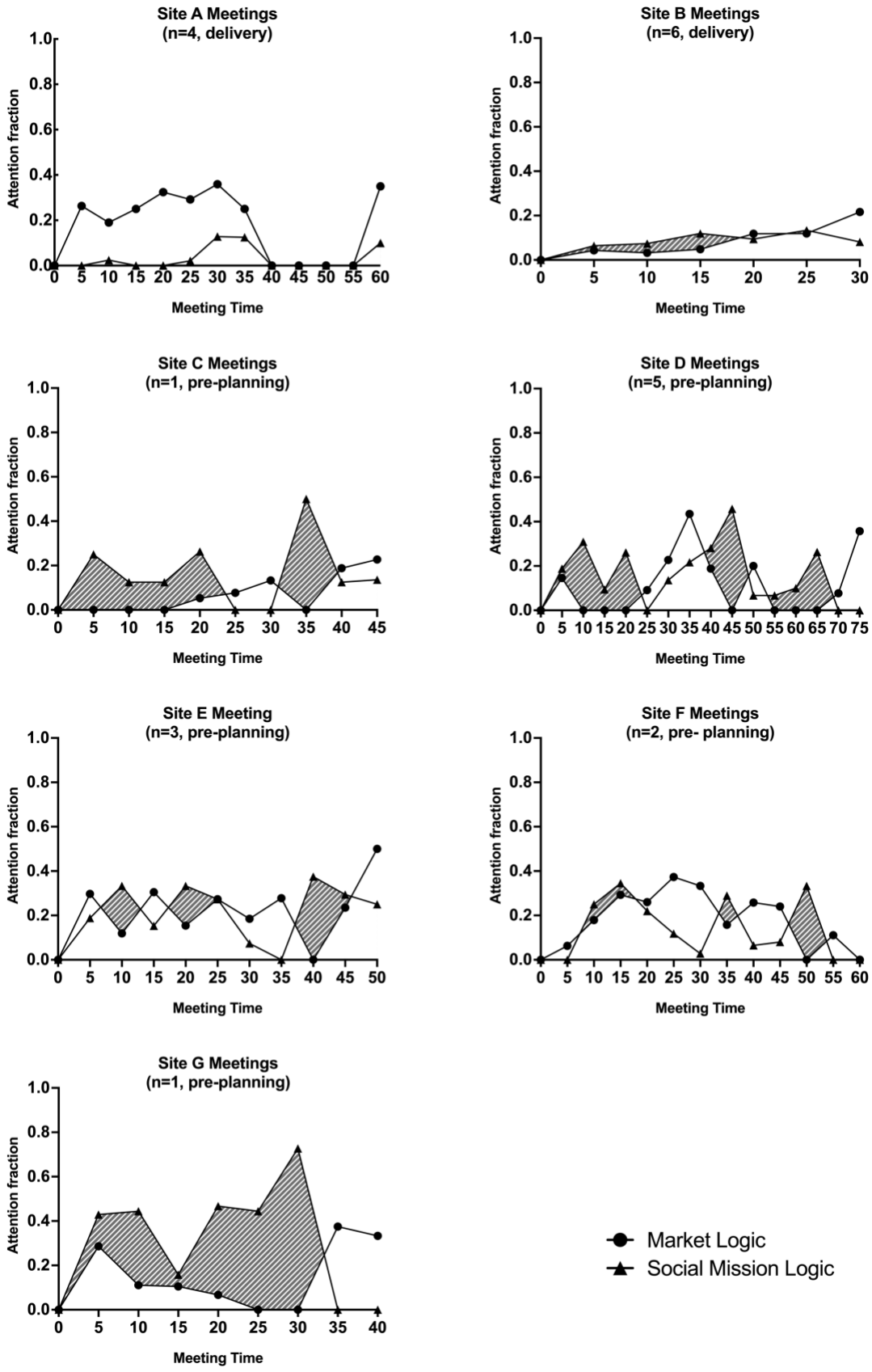


Figure 7–3: Change-over-time patterns for market logic versus social mission logic in regeneration team meetings

A detailed explanation of the behaviour is included in A4.1 Explanations of attention patterns in site meetings**.**

As the theory modelling aims to understand the general elements of the behaviours, the reference mode simplifies the behaviours observed and creates a presentation of the key changes in attentional patterns. Figure 7–4 presents the reference mode, including three key behaviours included in the reference mode regarding attention to the social mission (HWS):

1. Mission achieved: Successfully accomplish a specific goal regarding attention to HWS
2. Oscillation: Back-and-forth motion or oscillations in attention to HWS around a central point
3. Mission drift: Attention to HWS gradually shifts away from the original goal over time

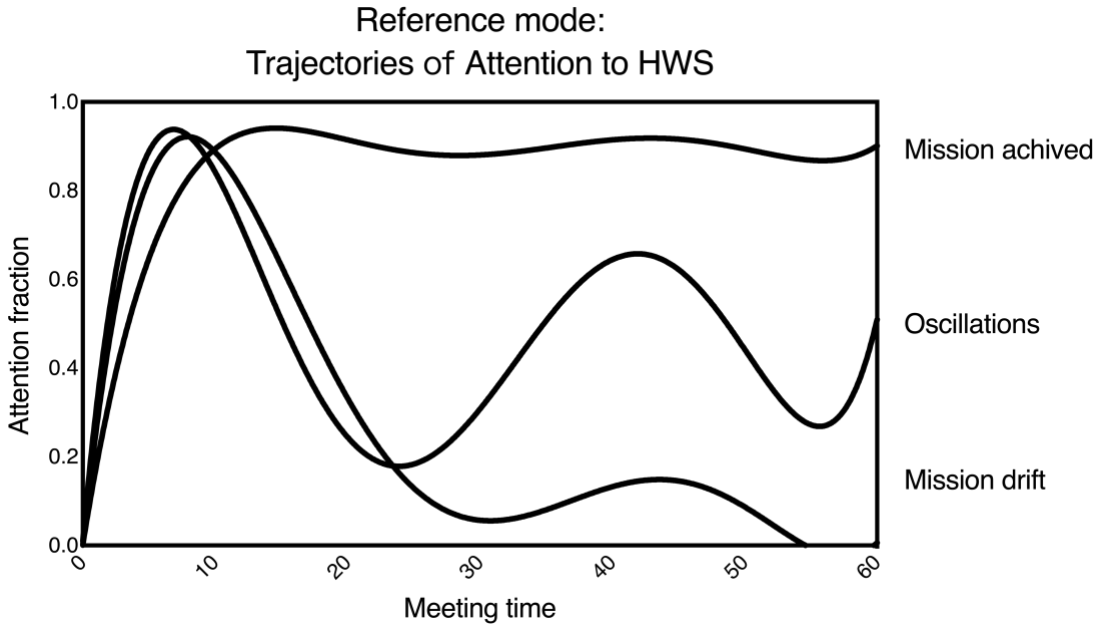


Figure 7–4: Reference mode of attention to HWS

7.4 Model structures

The simulation model focuses on the structural relationship represented by stocks, flows, and variables. Stocks (such as water in a bathtub) and flows (such as the water inflow to and outflow from the bathtub) are essential components of systems dynamics modelling. Stocks are the consequences of accumulating flows into and out of the stocks, as represented by rectangles in the figures. Stocks create delays and inertia in the system, as it takes time to accomplish the inflows and outflows.

In this section, the stocks and flows of attention allocation are presented.

7.4.1 Selecting and processing attention

In the meetings, attention to the topics represents a stock that can accumulate and change. As decision-makers capture attention stimuli, the attention flows into a stock titled ‘Attention to the topic’, which refers to the groups' selective focus of cognitive resources on specific topics, as Figure 7–5 indicates. The first structure concerns paying attention and processing attention. Paying attention means focusing on cognitive resources related to the topic. The accumulation of attention indicates that it is in a highly accessible state such that information can be quickly retrieved and be followed up by other information.

In the context of meetings, the attention can be triggered by the prescribed agenda, which explicitly represents the meeting's prescribed focus and concentration or the meeting’s goals which were agreed upon by participants. The analysis suggested that the agenda represents a key trigger of attention. The meeting's agenda can make the topic of discussion explicit, or the expectations of the decision-makers can suggest it. Decision-makers introduce meeting agenda, eliciting the team's attention and initiating a goal-seeking process. When attention flows into attention stock, it can be processed, thereby outflowing the attention and creating a balancing loop decreasing the attention to the topic.

While paying attention (inflow) corresponds to the process of focusing on the topic, processing attention (outflow) represents the process of making informed decisions or developing solutions, which transitions the topic to another topic. As the example in Figure 7–5 demonstrates, the topic about parking space was addressed because it was on the agenda, which activates attention, and as the team started to discuss the solutions and decisions, the issue regarding parking space was resolved. Other example agenda items such as community engagement, and the social matrix, budget performance, hiring, and project timeline.

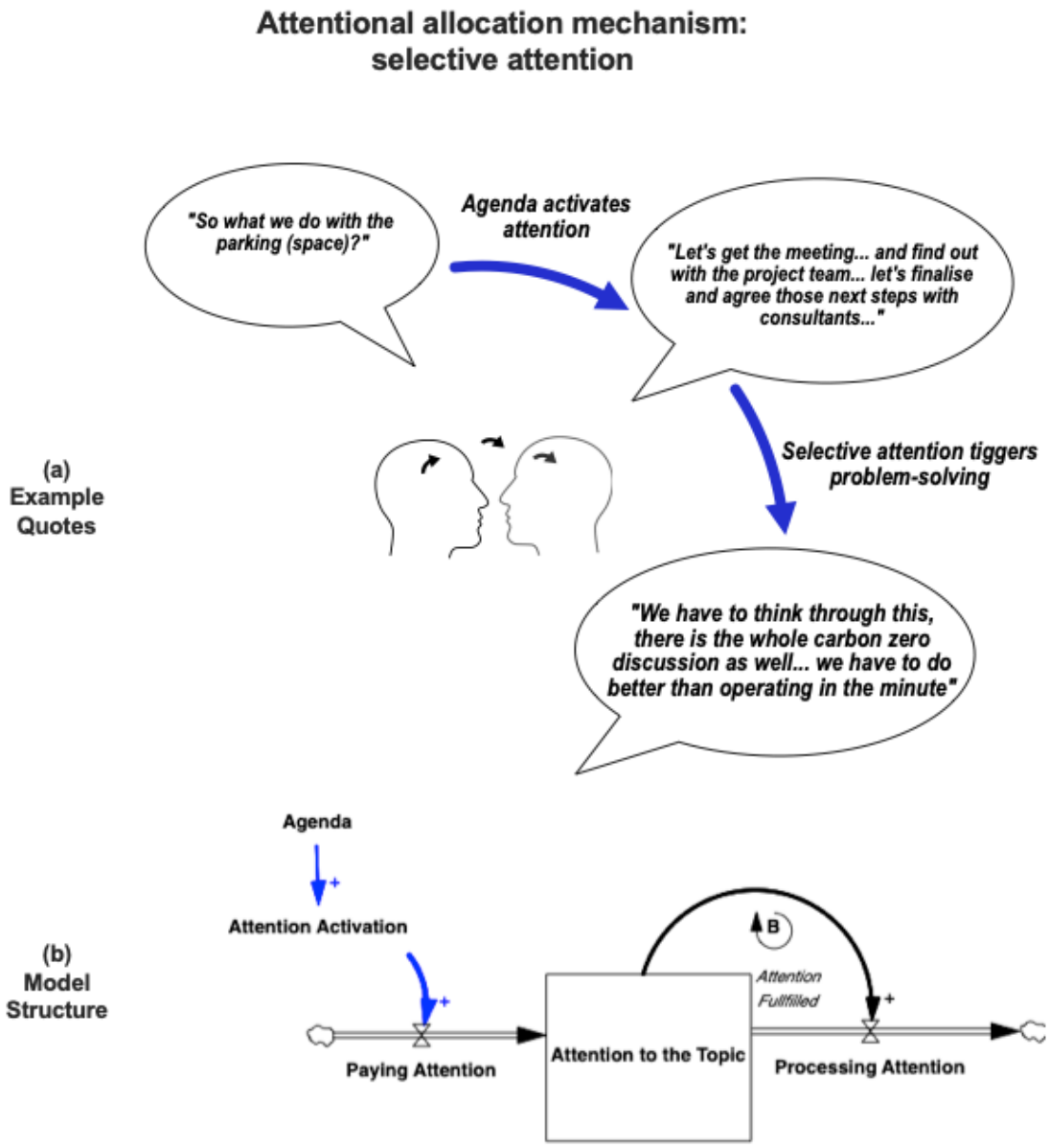


Figure 7–5: Selective attention. Note: Top: Example quotes. Bottom: Simulation model structure. The coloured links in example quotes are mirrored in the simulation model.

7.4.2 Reinforcing attention

The second mechanism is reinforcing attention, which means that the attention to in-depth conversations generates more follow-up questions and discussions of attention to the same topic, thereby increasing the attention and creating a reinforcing loop.

As the example suggests in Figure 7–6, the team had in-depth conversations regarding tenants' engagement. The starting point of the conversation was the question, 'what are the main concerns from the residents?', which directed attention to a list of topics, including 'social behaviour', complaints about the building, windows, and drainage system, which were mentioned by separate individuals in the meeting. The conversation then prompted more discussions about how to address the problem and ongoing discussions about how to improve the quality of the place. The following example also shows the reinforcing mechanism:

> *(Meeting participant) A bit about the social value element of the project. We've invited [peoples' names] from the jobs and training team as well to support that and then field any questions that they might have.*
>
> *(Another meeting participant) There's a couple of interesting, little projects in there... so if we keep an eye of that, particularly those of us understanding the social impact of what's a huge, physical change is incredibly important, so these little things just sort of help bed down the fact that it isn't just about demolition and moving earth around and disconnections. ...We just touched on social matrix as well, obviously, there's a meeting coming up that's going to firm all that up a bit more. I had a look at the social matrix offer for this scheme, it's actually not bad at all... it does look like there's some decent outputs from the scheme, so that's really good.*
>
> *(Continuous conversations regarding the social matrix programme) ... (Meeting 15, site C)*

In the conceptualised model, the activation of the reinforcing mechanism depends on whether the relevant topics were addressed and whether they were captured by other participants. In the model structure, the reinforcing mechanism was simplified to be dependent on two factors:

- firstly, the 'working memory' which is the storage of information relevant to the topic at hand to perceive the contextual focus, influencing 'contextual bias' which is the tendency of the group to perceive information relevant to the current topic while ignoring other information according to the working memory; and
- secondly, if the contextual bias triggers the updating of 'selection bias', which is the tendency of the group to selectively allocate their attention to certain topics based on the perceived context.

The working memory accumulates when the meeting participants focus on certain topics, and decays after certain minutes. The notion captures the transient nature of attention focus. When the working memory is shaped towards one logic over another, the 'contextual bias' is formed that certain topics according to the working memory is preferred. However, the triggering of this mechanism depends on the 'bias threshold'. If the threshold between the market and social mission topics is high, indicating that decision-makers do not update their selection bias unless the gap between topics is large, then a small gap between the two topics does not trigger the attention allocation.

Operationally, when the 'attention to the topic' increases, people store the focus of conversations as information in the working memory, and increasingly perceive the topic as being relevant to the context ('contextual bias'), thereby making meeting participants more likely to follow up on these issues that are relevant to the topic ('selection bias') and activating more attention inflow towards the topic, which creates a reinforcing loop of attention, as illustrated in the bottom of Figure 7–6. While this structure simplifies the group dynamics in meetings, it captures the primary factors necessary to activate attention.

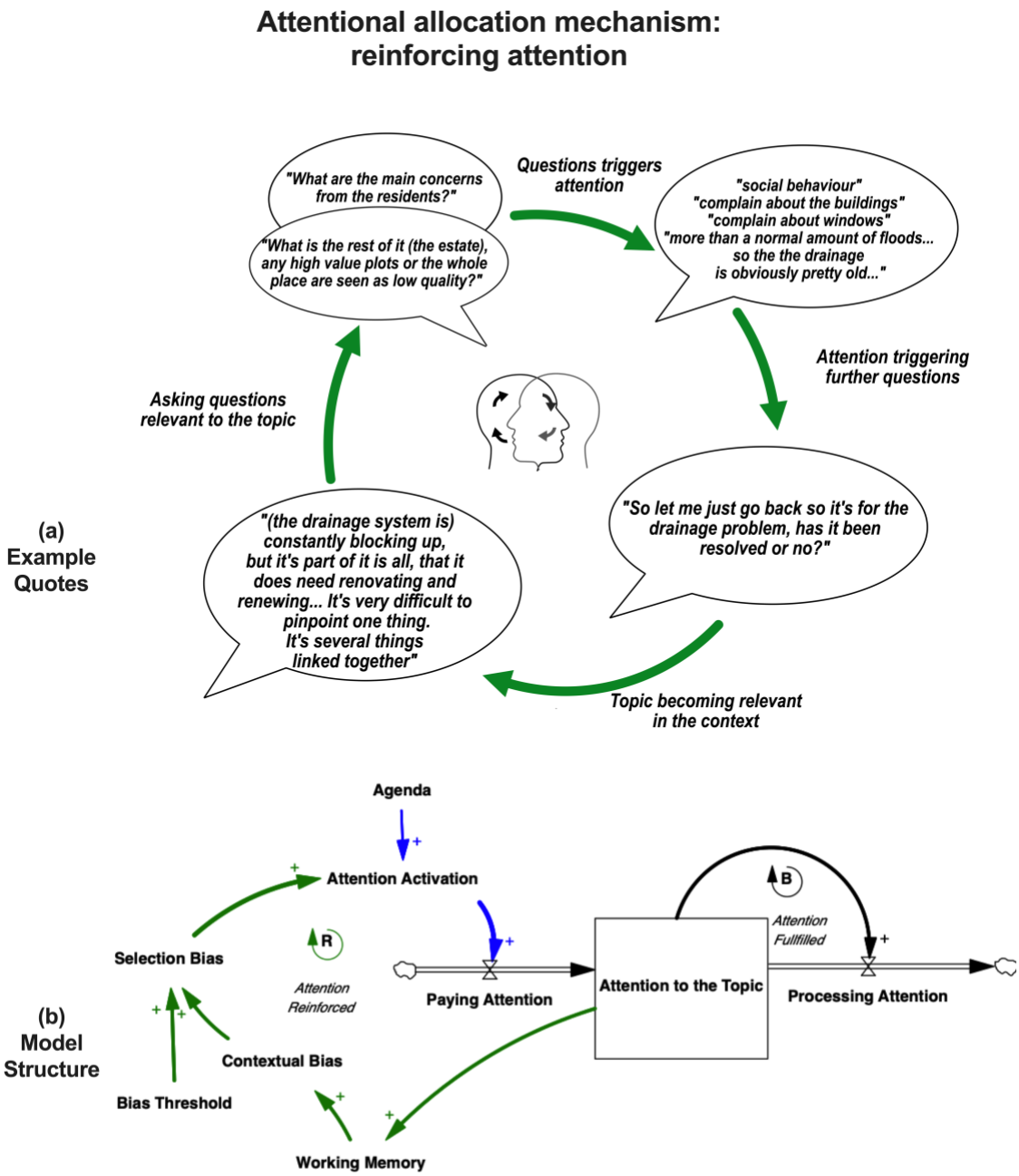


Figure 7–6: Sustaining attention. Quotation source: Site G.

7.4.3 Shifting attention

The third mechanism is shifting attention. As illustrated in Figure 7–7, when attention to one issue increases, it can also increase the 'demanded attention to the other topic' and increase the concentration emanating from the sustained attention stock, creating a balancing loop of shifting attention away.

In the context of complex and limiting attention resources, the group's cognitive resources can be shifted from one topic to another contrasting topic that focuses on different issues. The example in Figure 7–7 demonstrates that the conversation started with an agenda regarding policy compliancy, which activated attention to affordable housing; however, the group's attention was shifted to the market side when a participant raised concerns regarding budgets, which then activated the reinforcing mechanisms related to the market topics.

This attentional shift has been observed in both meetings and interviews. The HA believed that sales from redevelopment should benefit the neighbourhood's people. In pre-planning stage discussions, it was also noted that the regeneration team would analyse the percentages of socially leased dwellings in different regeneration goals. It was noted that the HA must identify financial resources to finance the sustainability initiatives, which means that when individuals discuss various sustainability project ideas, problems regarding the budget are likely to arise.

While the shifts in meeting topics revealed the presence of the connections between the social purpose and the market, the 'black box' of the attention-shifting process is complex and is heavily impacted by individual perceptions, organisational strategies, and policy agendas. In the simulation model, the variable 'demand attention from other topic' was constructed as a proxy to gauge the degree of demand produced for the other issue. It represents the extent to which the group feels that the other topic is important and requires their attention, although it may not be the primary topic of discussion now. The demanded attention was impacted by the 'demand strength (DS) of the other topic'. While this construction also simplifies the factors that contribute to the attentional shifts, the strength variable aggregates the various factors that can impact this mechanism, and the model can test different parameter values of the strength.

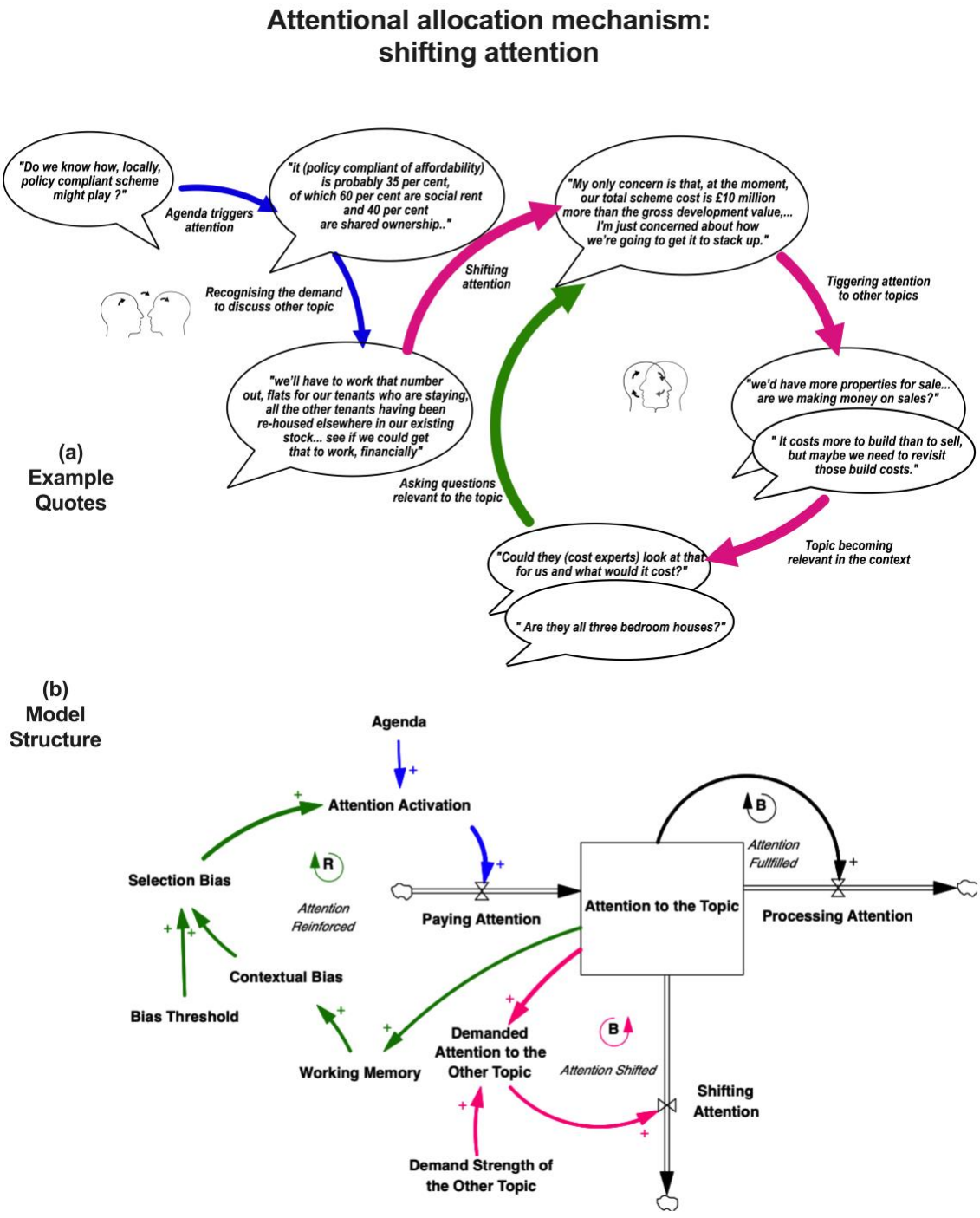


Figure 7–7: Shifting attention. Quotation source: Site E.

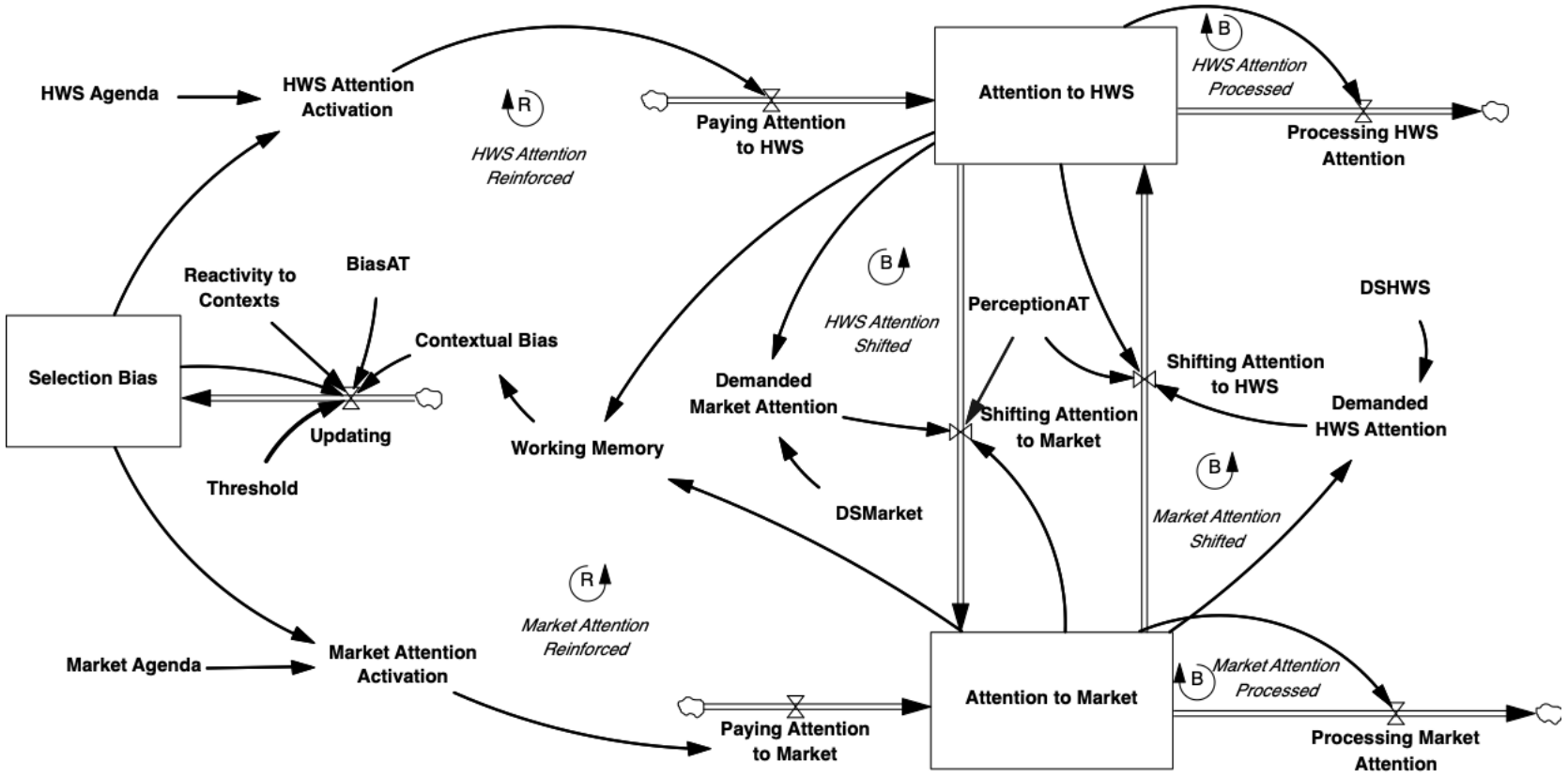


Figure 7–8: Simulation model overview. Note: AT = Adjustment time; DS= Demand Strength; HWS= Health, well-being, and sustainability

7.5 Computational formulations

In summary, three core mechanisms of attentional allocation were identified: selective attention and processing attention (see structure in Figure 7–5), attention reinforcements when the topics are followed up by the team members (see structure in Figure 7–6) and shifts to other topics (see structure in Figure 7–7).

The generic mechanisms were applied to both HWS and the market sector. As shown in the simulation model (Figure 7–8), the upper part represents attention to HWS, and the bottom portion represents the market. The three mechanisms presented are included for both institutional logics.

This section summaries the computational formulations of the model. The definitions of the terms are included in Table 7-2.

Table 7-2: Definitions of model terms

Term	Definition
Attention	Groups' selective focus of cognitive resources on certain topics.
Paying attention	The process of selectively focusing on a particular stimulus or information while ignoring others during discussions.
Processing attention	The process of attending to the topic and making informed decisions or developing solutions.
Working memory	The storage of information relevant to the task at hand, while filtering out irrelevant information.
Contextual bias	The tendency of the group to perceive information relevant to the current topic while ignoring other information according to the working memory.
Selection bias	The tendency of the group to selectively allocate their attention to certain topics based on the perceived context.
Bias threshold	The minimum level of difference between contextual bias to attract the group's and update the preference of topics.
Shifting attention	The process of redirecting the group's cognitive resources from one object or idea to another.
Demand strength of the other topic	The degree of cognitive resources required for a topic that is not currently being discussed in a meeting.

Attention stocks. The simulation model assumes that the attention to HWS and the market are two stocks. Attention stocks refer to the allocation of limited processing resources to certain sources of information over concurrently competing sources. The 'attention to HWS' and 'attention to market' are represented as stocks wherein the level of attention to a specific goal or stimulus is accumulated over time. The equations for the two stocks are

the same (see Equation 7-1). The inflows and outflows are the rates of change for the stock.

Equation 7-1: Attention stocks. Note, 'i' in the subscript refers to the two categories of attention (HWS, Market).

$$Attention_i = INTEGRAL\big(PayingAttention_i - ProcessingAttention_i - ShiftingAttention_i, Attention_{i(0)}\big)$$

Attention inflow and activation. The inflow 'paying attention' into the stock represents the attention activation process that increases attention to the agenda or stimulus and the remaining available attention (see Equation 7-2). The increase in both attention stocks decreases the remaining attention.

Equation 7-2: Equation of attention inflow for Equation 7-1.

$$PayingAttention_i = RemainingAttention * AttentionActivation_i$$

The attention activation process is dependent upon whether there is a clear agenda (see Equation 7-3). When there are agendas (when the agenda switch=1), the attention activation equals the agenda multiplied by the selection bias presented at the meeting.

Equation 7-3: Equation of attention activation for Equation 7-2. Note: Agenda switch = 0 (no agenda) or 1 (agenda)

$$AttentionActivation_i = \big((1 - AgendaSwitch) + AgendaSwitch * Agenda_i\big) * SelectionBias_i$$

Attention selection bias. The selection bias can include a range of factors, such as the task's perceived importance or personal interest. In the model, it was assumed that the selection bias could be updated by decision-makers in the meetings (see Equation 7-4).

Equation 7-4: Equation of selection bias for Equation 7-3.

$$SelectionBias_i = INTEGRAL\big(Updating_i, SelectionBias_{i(0)}\big)$$

The flow of updating bias account for the influence of contextual bias and the threshold for bias activation. As Equation 7-5 indicates, the updating process depends upon the following:

- The contextual bias (the perceptions of attention focus on the working memory, capturing the impact of information from topics being discussed).

- Individuals' reactivity to the contexts (to what extent people feel strongly about responding to the contextual bias).
- The selection bias that was present in the previous time step, which reflects the extent to which the individual's attention was biased towards one logic.
- The updating switch, which is on if the contextual bias arise from difference of working memory of the two attention categories exceeds the bias threshold. Otherwise, the updating switch equals 0, and the selection bias is not updated.

Equation 7-5: Equation regarding the updating selection bias for Equation 7-4.

$$Updating_i = \frac{(ContextualBias_i - SelectionBias_i) * ReactivityToContexts}{BiasAT} * UpdatingSwitch$$

Attention outflow. The outflow could include distractions, such as notifications, interruptions, or competing tasks. There are two outflows for each attention stock. The first outflow is 'processing attention', which equals the attention stock divided by the time needed to process the attention. The second outflow, 'shifting attention' from the stock, represents how the attention is shifted from one focus to another one. As Equation 7-6 indicates, as the attention stock (attention i1) increases, it increases the demanded attention from the other stock (attention i2), depending on the demand strength of the competing task (DS of i2). The attention gap generated by the attention demand in comparison to the existing amount of attention to the competing task is then divided by the perception adjustment time (AT), determining the rate of shifting attention away. The shifting outflow represents the amount of attention that is shifted away from the current attention stock (attention i1).

Equation 7-6: Equation regarding shifting attention for Equation 7-1.

$$ShiftingAttention_{i1} = \frac{Attention_{i1} * DemandSrength_{i2} - Attention_{i2}}{PerceptionAT}$$

In the model, as illustrated in Figure 7–8, the two demand strength variables are 'demand strength of market' (DSMarket) and 'demand strength of HWS' (DSHWS). Operationally, DSMarket represents to what extent market topics will be demanded as decision-makers pay more attention to HWS. For example, when decision-makers determine social matrix indicators, they discuss the finances and costs associated with implementing social value

initiatives. To what extent the topics needed to be mentioned together is captured by the variable DSMarket. Equally, while discussing expenses and budget, demand for HWS attention can be created when decision-makers agree that the budget should be invested in social value projects. DSHWS quantifies the strength of the HWS demand created by market attention.

The equations in the SD model are included in **Appendix A4.2 Model technical documentation**. In summary, the model applies the generic structures to two sub-sectors: HWS and market logic. The model captures various scenarios:

- For example, when the social value matrix is included as an agenda, it increases the *HWS goal*, triggering the decision-makers to *pay attention to HWS* issues, transitioning the attention toward *attention* to *HWS* (paying attention).
- If the topic is quickly addressed without extensive discussion, the stock of selective HWS attention is reduced when the meeting *processes HWS attention* (processing attention). In this case, it frees up the *available attention input* and allows more attention toward social mission logic or market logic.
- If the topic is thoroughly discussed, for example, the meeting participants *follow up on HWS topics*, generating more relevant HWS topics that can be discussed, and the attention is reinforced (reinforcing attention) as participants store information in their working memory, and increases selection bias towards HWS topics as the contexts focus is on HWS topics .
- On the other hand, the *attention to HWS* could be shifted when the topic is *shifted from HWS to market* topics (shifting attention), transitioning the topics towards *market attention*.

The same rationale of attention allocation applies to the market sub-sector. The HWS sector and market sector have symmetrical structures, as illustrated in Figure 7–8.

7.6 Simulation results

This section summarises the simulation experiments, sensitivity analysis, and policy explorations.

7.6.1 Experiment conditions

To test how to sustain the attention to social missions and its connections with attention to markets, five simulations have been conducted.

7.6.1.1 Experiment 0: Equal goals

The baseline simulation run assumes that the decision-makers started the meeting to focus on HWS and market topics equally (goal= 0.5) and that the demand strength from each is equal (DSHWS= DSMarket=1). In this scenario, it is assumed that the goals regarding attention to the two institutional logics are the same. Attention increases quickly for both types of logics. As the attention demand from each is equal, no gaps shift the attention. The stimuli for both types of attention decrease over time as the remaining attention decreases.

As Figure 7–9 illustrates, attention to HWS and the market catches up to the attention goals in the first 15 min and then remains the same (=0.5) throughout the 60 min simulation time. The contextual bias regarding HWS equals 0.5 as the baseline throughout the simulation time, as no topics dominate over the others. Consequently, the selection bias regarding HWS also does not change and equals 0.5 as the baseline, indicating that there are no preferences for HWS over market topics from participants.

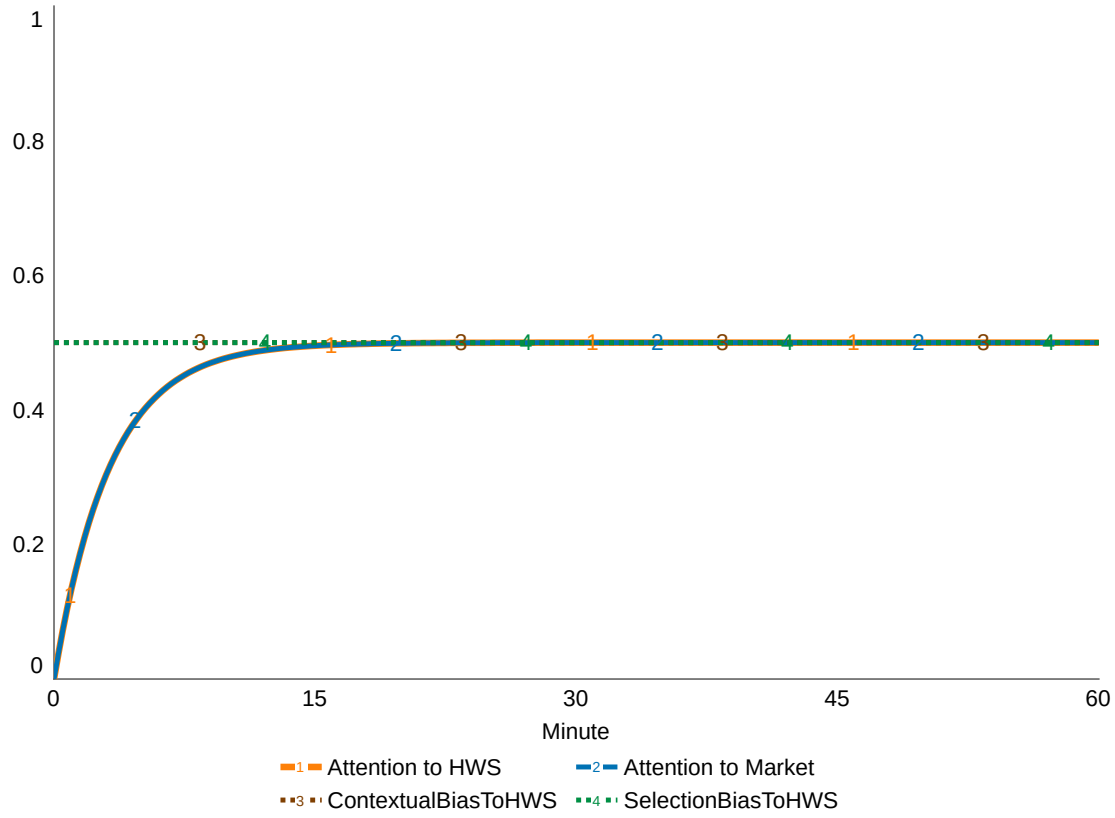


Figure 7–9: E0: Equilibrium. Initial market goal =0.5. Initial HWS goal =0.5. DSMarket= 1. DSHWS=1.

7.6.1.2 Experiment 1: Risks of HWS mission drifts

This experiment assumes that the stakeholders start with higher market goals in the meeting. In this case, the initial attention to marHWSket logics equals 0.75, which is triple the social mission logic (Market goal =0.25), indicating that the participants agree the meeting will focus on the HWS issues. As Figure 7–10 (a) indicates, due to the inflow of selective attention during the first 10 minutes, both attention stocks continue to increase. While the attention to the market swiftly increases in the first 15 minutes, the selective attention to the HWS does so more quickly, as the goal is substantially higher. The increase in the attention to HWS exerts two impacts in the model:

- Firstly, HWS attention increases the baseline of selection bias towards HWS, as the Figure 7–10 (a) illustrates; the bias towards HWS is above 0.5 throughout the simulation time due to the dominance of the attention to HWS, indicating that HWS topics are preferred.
- Secondly, the quick increase in attention to HWS generates an equal amount of demanded attention to the market (DSMarket=1); consequently, attention starts to shift from HWS to the market from 15 minutes onwards. Thus, the attention to the market starts to increase faster after minute 15.
- Thirdly, the contextual bias towards HWS starts to decrease first, as attention to market increase, which decreases the selection bias towards HWS. However, because the attention to HWS still dominates, the selection bias is towards HWS, despite the slow decline of the selection bias.

E1 (a) indicates that while the goal of HWS is higher, the dominance of HWS can generate risks of mission drift wherein the attention to HWS starts to decrease, even if there is equal demand regarding other types of attention.

Subsequently, the experiment further tested whether the changes in demand strengths can change the attentional patterns. E1 (b) assumes that the market's attention demand strength was considered higher (DSMarket=2), whereas the HWS's strength of attention demand was assumed to be lower (DSHWS=0.5). Operationally, in this case, the decision-makers attempt to introduce market topics when there are HWS conversations. For example, if someone speaks about social mission topics, such as sustainability and social value, cues (such as ‘how much that will cost?’) would shift the conversations.

As Figure 7–10 (b) indicates, due to the inflow of selective attention during the first 10 minutes, both attention stocks continue to increase as E2 (a). However, the attention to the market increases rapidly in this condition, and at about minute 20, attention to the market surpasses the attention to HWS. There are several key observations regarding the two experiments:

- Firstly, the shifting attention from HWS to the market is faster in E1 (b) in comparison to E1 (a); this is because the strength of the market demand (DSMarket) is higher, resulting in a more dramatic shift from the HWS focus. As the DSHWS is lower, the dominance of the attention to the market, conversely, generates minimal demand for HWS attention, reinforcing the dominance of market attention.
- Secondly, the selection bias towards HWS declines from the initial conditions more rapidly in E1 (b) in comparison to E1 (a) at about minute 35, which represents half of the simulation time, the selection bias towards HWS is under 0.5, meaning that market topics are more favoured in the meeting contexts, which results in more attentional inflow towards market attention, further increasing the dominance of market attention.
- Thirdly, even the initial contextual and selection bias are the same in E1(a) and E1 (b), as the initial goals are the same in both scenarios; due to the quick increase in market attention in E1 (b), the contextual and selection bias started to decrease faster and went below 0.5, indicating that more topics will be linked to the market, reinforcing the market attention.

The two conditions demonstrated the risks of HWS mission drift when the attention to HWS is not sustained or is surpassed.

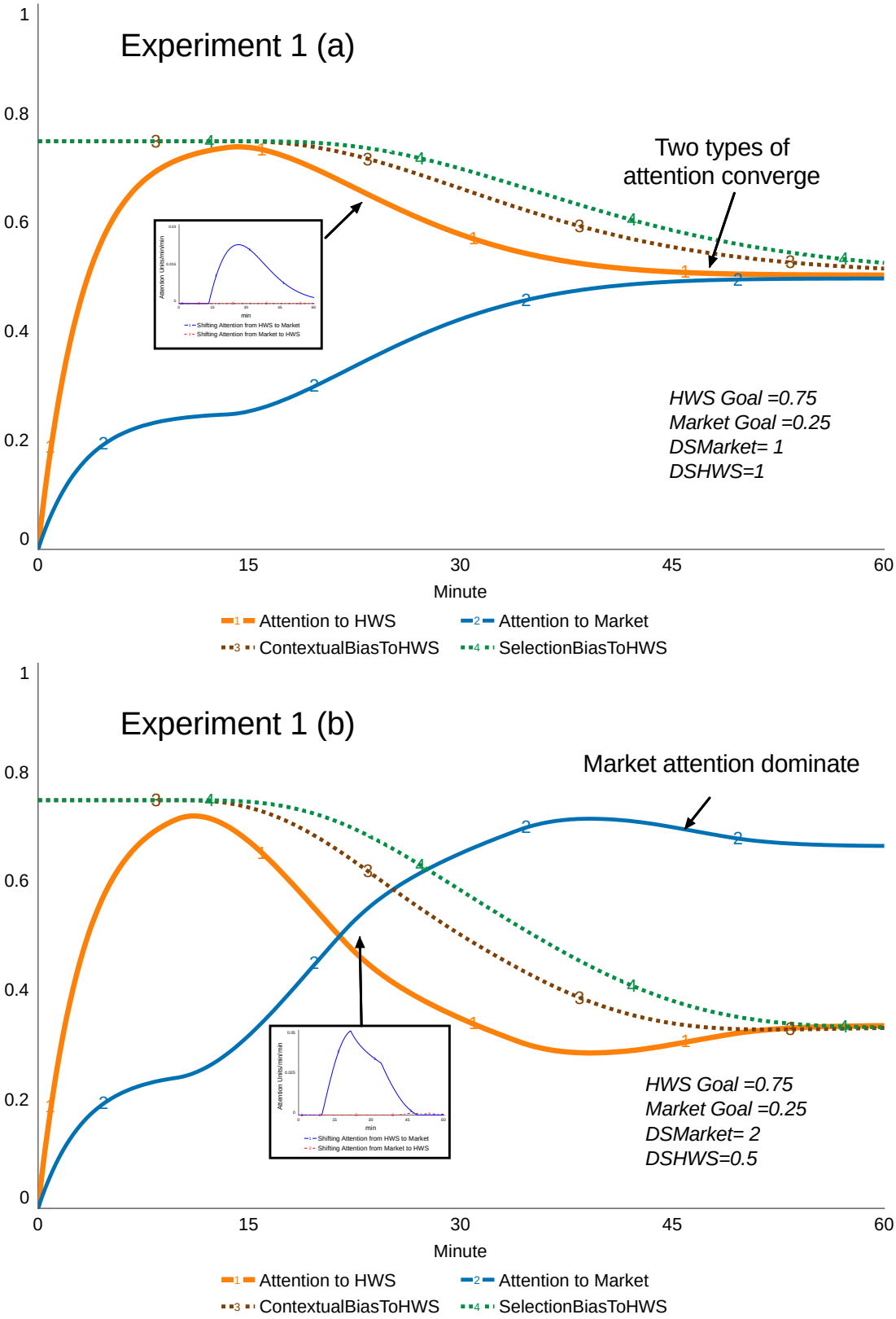


Figure 7–10: E1: Stronger HWS goal with high market strength. HWS Goal =0.75. Market Goal=0.25. Top: E1 (a): DSMarket=1, DSHWS=1; E1 (b): DSMarket=2. DSHWS=0.5.

7.6.1.3 Experiment 2: Oscillations in attentional allocation

Experiments 2 (a) and (b) further explored the shifts in attention allocation. It was assumed that the initial market goal was higher than the initial HWS goal and that the demand strength was the same for both types of attention. The patterns of oscillations were observed in this parameter setup. To observe the long-term trajectories of the attention allocation, the attention shifting adjustment time was shortened from 10 min to 5 min.

Figure 7–11 (a) presents the experimental results. Within the first 15 min, attention to the market quickly increases due to the high initial goal of market. Between 15 and 20 minutes, attention to the market started to decline, while prolonged attention to the HWS increased. The explanation, which is similar to E1, is that when the market focus increases, HWS is also required to provide an equivalent level of attention, which causes some market attention to be diverted to HWS. The HWS attention continues to increase for about 15 minutes until it declines again, as seen in the figure. From 15 to about 25 minutes, the market attention began to increase again because as the HWS grew, more market attention was required, which caused the themes to change again. Throughout the simulation, the shifting cycles continued, but the gap between the two attentional stocks narrowed. Both attentional stocks converge at around 0.5.

To test to what extent the selection bias can influence the oscillations, in E2 (b), the bias threshold was increased from 0, which was the baseline value in all previous experiments, to 0.2. When the bias threshold equals 0, it means that meeting participants invariably transition the conversations toward the current focus of conversation, whenever there is a difference between the two attention categories. When the threshold equals 1, it means that meeting participants do not transition the conversations toward the current focus of conversation. The increase in the threshold indicates that it is now more difficult to update the conversations according to the focus of attention.

As the E2 (b) result indicates at the bottom of Figure 7–11, when the bias threshold increases to 0.2, the updating selection bias process exhibits limited changes as a result. The system continues to oscillate, but it takes longer to converge. The reason for this is that even when the attention to HWS tries to catch up and the contextual preference to HWS increases, the selection bias regarding HWS increases limitedly and slowly at about 10min when there is great gap between the attentional stocks, and remain same afterwards despite the oscillations. Consequently, even when HWS attention attempts to catch up, the selection bias is not updated despite the rising of contextual bias.

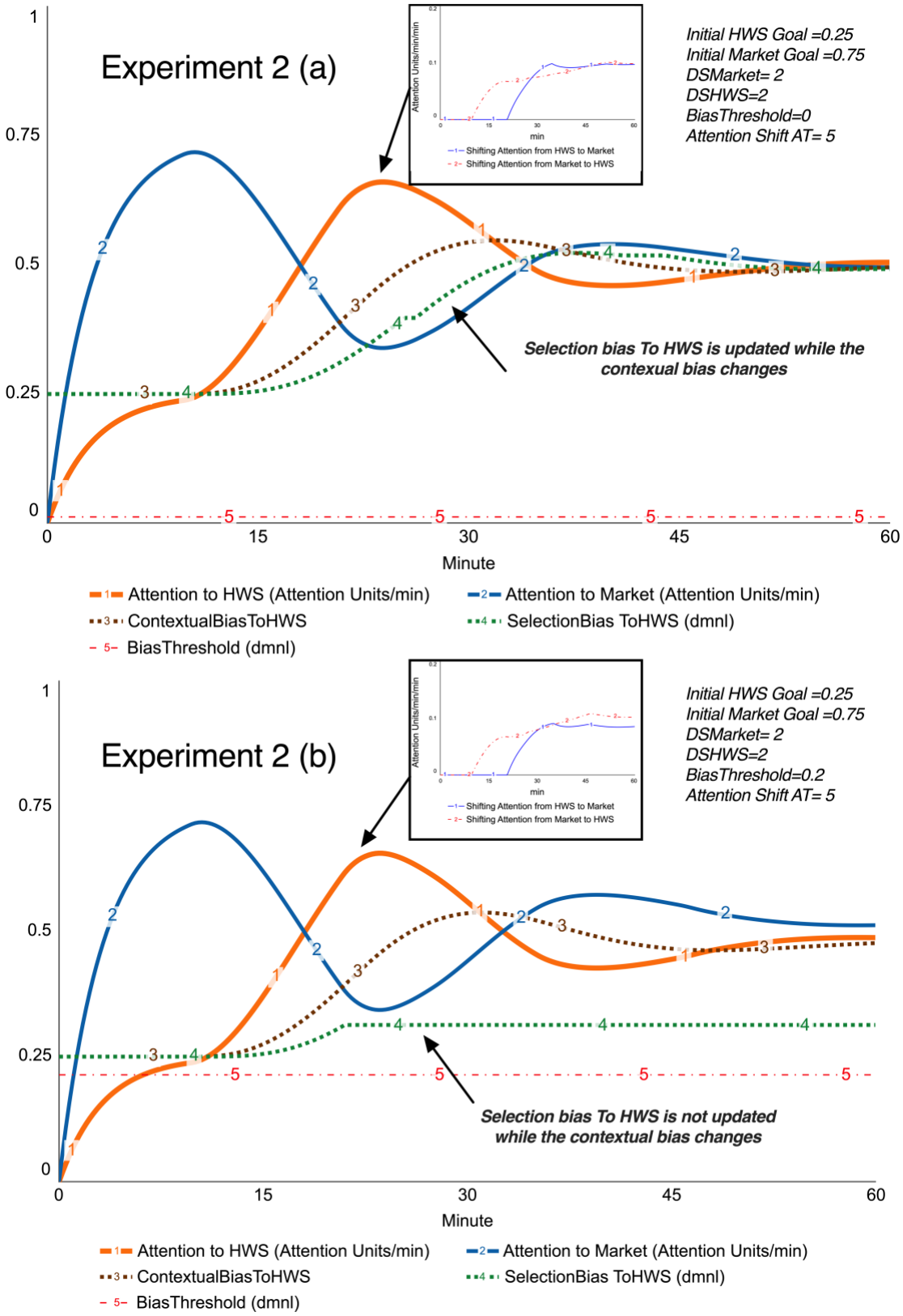


Figure 7–11: E2: Agenda switches with equal goals. Meeting agenda switch is on. Market goal=0.5. HWS goal=0.5. DSMarket=1. DSHWS=1.

There are two insights from the two scenarios:

- Firstly, the structural connections between the two attentional types caused the oscillations. Despite the initial dominance of market attention, the oscillations and shifts in attention made it possible for HWS attention to catch up when the demand strength of HWS is high.
- Secondly, the adjustments of selection bias can help to closing the gap between the attentional stocks. The oscillations continued and were dampened when the perceptions were adjusted to meet both demands. But if meeting participants have higher tolerance of the oscillations (when the bias threshold is high), it is more challenging for HWS to catch up when attention is primarily assigned to market.

7.6.1.4 Experiment 3: Switching the agenda

This experiment presumed that there were clear agenda items and that the agenda for the meeting would change between subjects related to the social purpose and the market. The rationale for this set-up is to test the role of meeting agenda.

As the left of Figure 7–12 indicates, the goals of HWS and the market topic are interchangeable. The initial goal regarding two types of attention is same (HWS goal = 0.5, Market goal = 0.5), indicating that the participants agreed that the meeting should address both the market and HWS topics. As part of the setup, six agenda items were used as input. The market was the focus of the agenda during the first 10 minutes.

In the first condition E3 (a), the demand strength for the two attention types were the same, and the bias threshold equalled 1, indicating that the meeting participants adhere to the agenda and do not change the conversations according to the current focus of the conversation (see Experiment 2 (b) for the testing of the bias threshold when there is no agenda). As Experiment 3 (a) reveals, there are ongoing oscillations/shifts between the attention categories. This experiment demonstrates that a switching agenda can also produce attention oscillations. While there are oscillations in the contextual bias, the participants adhered to the agenda and did not change the focus.

For Experiment 3 (b), DSHWS is lower while DSMarket is higher. As a result, when the attention was shifted toward HWS agenda items, it generated an additional and stronger demand regarding discussing market items, resulting in the attention shifting within the duration of the HWS agenda. It is intriguing that despite HWS being on the same agenda list as the market and the fact that there were no additional efforts to shift the conversations according to the focus of the current topic (bias threshold still equals 1 as experiment 3 (a)), there were higher risks of attention drifting in this scenario.

Subsequently, for Experiment 3 (c), the bias threshold was lowered to 0, indicating that the follow-up conversations depended upon the current focus of conversation. As a result, the risks of attentional drifting were further enlarged, and the market logic received more attention when the meeting focused on the market agenda. This is because when the strength of the market demand was greater, the attentional shifting process was greater from HWS towards the market; once meeting participants started to adjust the conversations basing on the attentional focus (contextual and selection bias), it generated further attentional inflow towards the market.

Within the few scenarios, the agenda items are interchangeable, and each one is scheduled to be debated for 10 minutes. It is assumed that the agenda for one item is only swiftly checked in after extensive discussion of another issue. There are a few insights from the experiments.

- Firstly, while the shift in attention is inevitable because of the switches in the agenda, there are still high risks of attentional drift. When it comes to HWS agenda items the conversation can still deviates from the original plan. The demand strength of the attentional focus continues to generate dynamics of shifting attention away, and the impact on attention allocation accumulates when the meeting proceeds.
- Secondly, in cases when market attention dominates, if participants attempt to adjust the topics based on the current focus of conversations, the market attention will be reinforced, presenting higher risks of attentional drifts.
- Thirdly, if the demand strength are same and meeting participants adheres to the agenda, the risks of mission drifts can be mitigated if the initial goals of attention types are same.

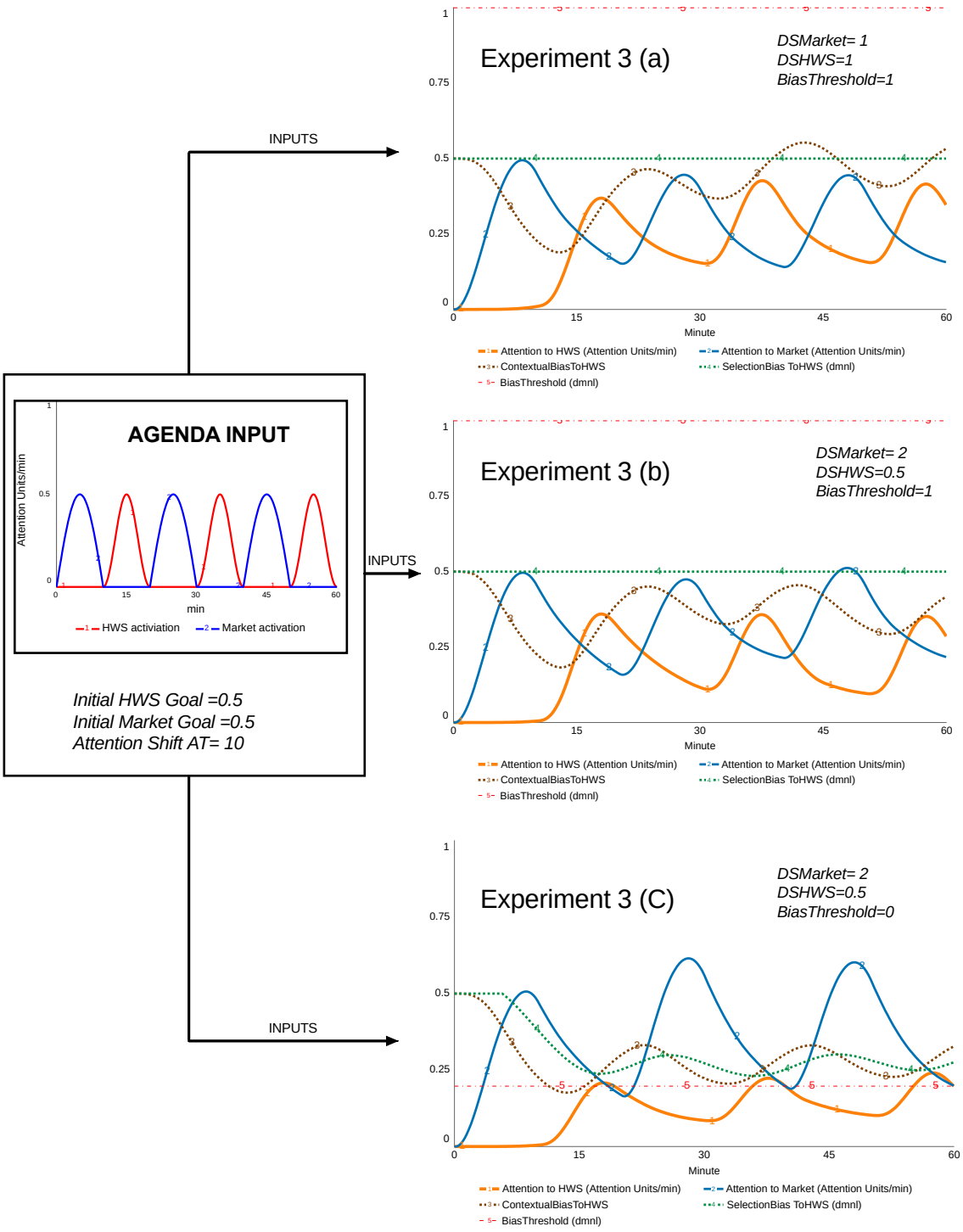


Figure 7–12: E3: Agenda switches. Market goal=0.5. HWS goal=0.5. Agenda switches.

7.6.2 Sensitivity analysis

The previous experiments demonstrated the impact of changes in variables on the trajectories of attentional patterns. The sensitivity testing was performed to determine the sensitivity of specific parameters to the accumulations of changes. The sensitivity tests had two objectives: The first was to investigate the relationship between the two attentional types, and the second was to evaluate how the structure's design affects the system's behaviour.

Rather than merely focusing on selective attention, the sensitivity tests specifically aimed to explore how the changes in the parameters changed the focus and concentration on a task or stimulus over an extended period.

In the meetings, sustained attention can be understood as the cumulative attention when decision-makers selectively focus on certain topics over time. In this sense, selective attention is the rate of change at which the sustained attention accumulates. To facilitate the exploration of sustained attention, an auxiliary variable was developed called 'HWS dominance'. The changes in HWS dominance represent the difference between sustained attention to HWS and the market, as the following equation conveys:

Equation 7-7: Changes in HWS dominance

$$\frac{d_{HWSDominance}}{d(t)} = Attention_{HWS}(t) - Attention_{Market}(t)$$

Three variables (DSMarket, DSHWS, and bias threshold) were included in the sensitivity analysis, as they generate primary changes in the model's behaviours, as previous tests have revealed. Both demand strength variables range from 0 to 5 using uniform distribution. The bias threshold ranges from 0 to 1 using uniform distribution. The use of uniform distribution allows for an equal probability of any value within a given range being selected. It helps to identify which input parameters exert the greatest impact on the model's output. In comparison to the normal distribution, which assumes that the parameter value is normally distributed, uniform distribution does not presume any prior knowledge or preference for values. This sensitivity parameter setup suggests that the values have an equal probability of occurring within the specified range.

The sensitivity analysis employs Latin hypercube sampling, which divides each parameter space into equal probability bins and randomly selects samples from each bin, creating a collection of parameter combinations. In comparison to the other type of sensitivity analysis (e.g., random sampling), this technique allows for a more complete search of the combinations of parameters and a focus on the exploration of parameter interactions.

As the bottom-right corner of Figure 7–13 indicates, the dominance of HWS is greater when DSHWS is high; despite the changes in the threshold (whether the bias threshold is high or low), the attention to HWS can strongly dominate over market attention. Conversely, as the upper-left corner of Figure 7–13 illustrates, when DSMarket is high, attention to the market dominates (as the HWS dominance becomes negative),

particularly when the bias threshold is high. When the demand strength of HWS and Market is relatively close to each other, there are high levels of oscillations, but overall, HWS can still have satisfying outcomes.

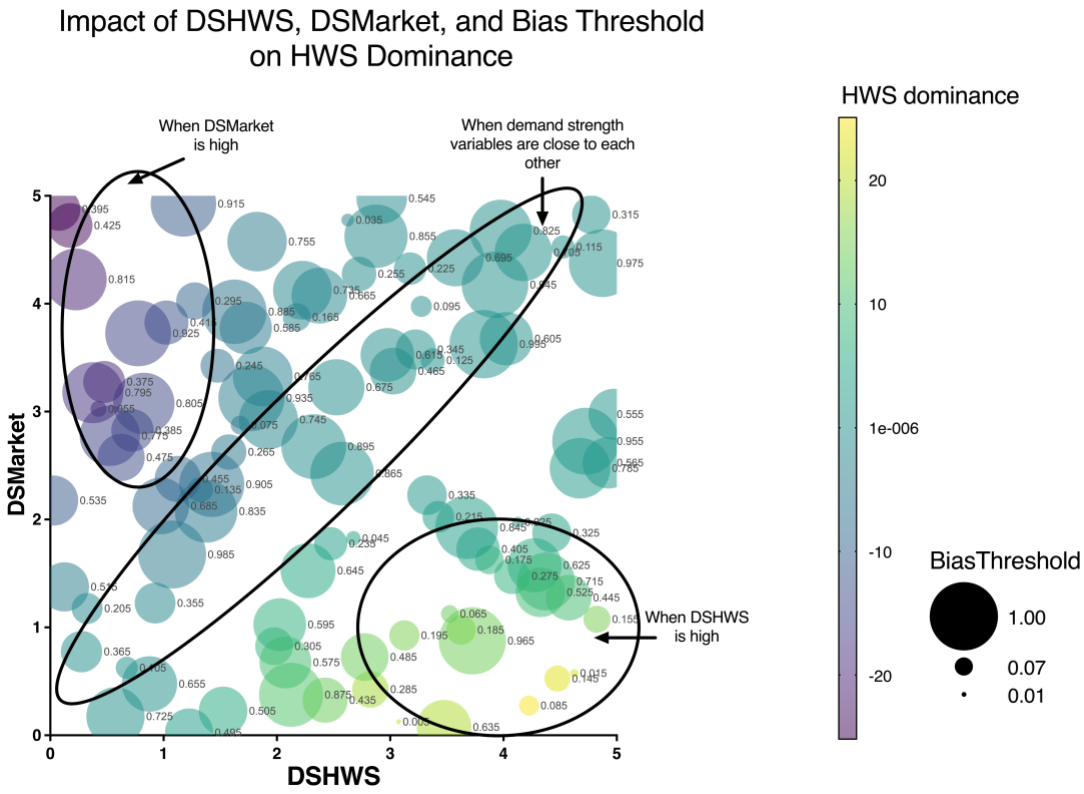


Figure 7–13: Exploring the impact of DSHWS, DSMarket, and bias threshold on HWS dominance. X-axis: DSHWS. Y-axis: DSMarket. Bubble size: bias threshold. Bubble colour: HWS dominance. Note: Initial goal of HWS=0.5.

To further explore how the initial goals of HWS skewed the results, the sensitivity tests were conducted again with different initial goals of HWS: 1) high level of the initial goal of HWS when it equals 0.75; and 2) low level of the initial goal of HWS, which equals 0.25. The results are presented on the left and right sides of Figure 7–14 separately. The left side of the figure indicates that when there are high goals regarding HWS, the high strength for the market (DSMarket) can immensely increase the probability of HWS mission drift so that the attention to HWS does not become the focus of the conversations at all. Particularly when the bias threshold is low, the bias reinforces the dominance of market attention. In cases when the initial goal of HWS is low, the HWS mission can catch up slightly when the strength of market demand is minimal and when the bias threshold is quite high.

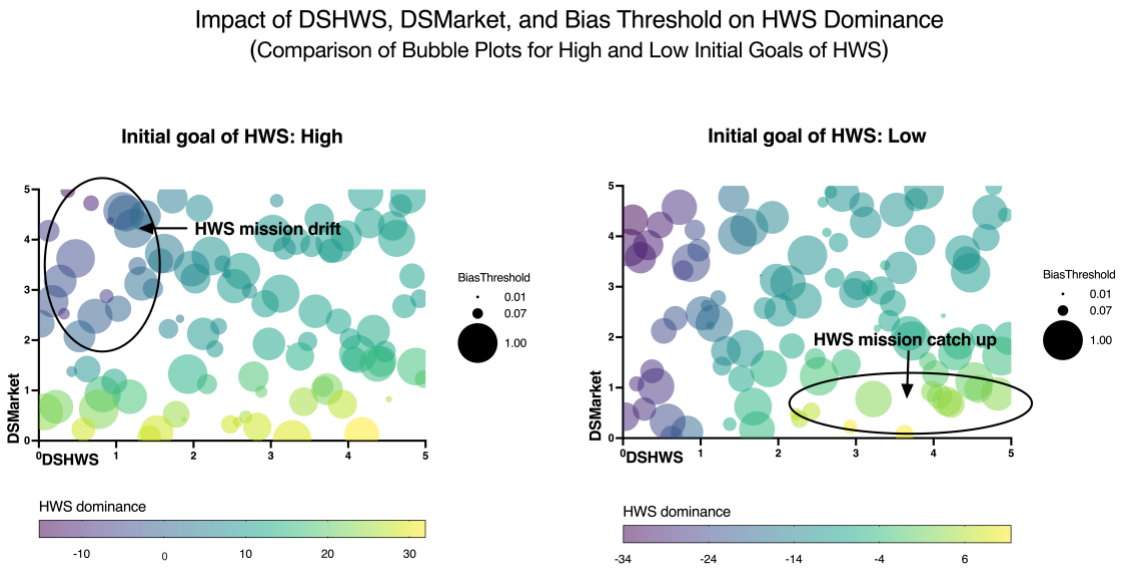


Figure 7–14: Comparisons of high and low initial goals regarding HWS, exploring the impact of DSHWS, DSMarket, and bias threshold on HWS dominance. X-axis: DSHWS. Y-axis: DSMarket. Bubble size: bias threshold. Bubble colour: HWS dominance. Note: Left: initial goals of HWS=0.75; Right: initial goals of HWS=0.25.

There are several key insights from the experiments and sensitivity tests.

- The relative strength of HWS in comparison to the market determines whether HWS can dominate over time despite the value of the initial goal regarding HWS.
- In situations where market logic dominates the discussions, a low bias threshold exacerbates the risks of attention drifts towards market-oriented topics. This occurs because the meeting's direction is heavily influenced by the dominance of market-related factors, and a low bias threshold makes it easier for the conversation to shift in that direction. This can potentially lead to a lack of diversity in discussion topics.
- On the other hand, when efforts are made to refocus attention on HWS topics, a low bias threshold becomes beneficial. In this context, a low bias threshold aids meeting participants in quickly recognising relevant cues within the discussions and effectively aligning with the intended focus on HWS topics. This sensitivity to contextual cues helps participants respond appropriately and maintain the desired conversation direction.

7.7 Discussion

CHAPTER 6 summarised three theoretical perspectives regarding managing tensions, namely organisational attention, institutional complexity, and paradox theory, and elucidated relevant theoretical models using CLDs, highlighting the systems approach to understanding the underlying structure that produces or alleviates competing demands.

This chapter described a SD model of attention allocation under competing institutional logics, grounded on a case study of HAs in the UK and a review of the theoretical models. This section summarises the model's contributions and potential uses.

7.7.1 Contribution to complex institutional logics and decision-making

During the last decade, researchers employing the ideas of institutional complexity have examined the consequences of logic competition and the implications of managing grand challenges. While much research has shown interest in long-term trajectory changes of the competing decision demands, especially in socioeconomic implications, theories, and tools for explaining the complexities and dynamics are limited.

The simulation model contributes to understand the tensions of decision-making when multiple logics compete, and demonstrates the various mechanisms of how attention toward a certain institutional logic can be triggered and sustained, offering generic insights into the management of competing institutional needs in relation to attention allocation.

7.7.1.1 Structural competition regarding attention allocation facing institutional tensions

Organisations with multiple institutional demands face tensions regarding legal structures, financing, cultural development, and the needs of customers and beneficiaries (Battilana, Lee, et al., 2012). Tensions could potentially expose organisations to the risk of losing social missions when they focus on other institutional demands, resulting in 'mission drift' (Ebrahim et al., 2014) or creating opportunities for organisations to achieve plural or multiple outcomes (Santos et al., 2015). Although several models have been developed to demonstrate the persistence of tensions (Smith & Lewis, 2011; Weiser & Laamanen, 2022), the nature of the competition, oscillations between logics, and how to sustain organisations' attention to certain institutional logics, as opposed to mission drift, remain undertheorised.

The model contributes to theorise the underlying causal mechanisms in institutional complexity and competing demands by extending current theories (see CHAPTER 6).

This simulation model contributes insights regarding understanding the reinforcing and balancing mechanisms at the structural level, thereby explaining recurring tensions and competing demands (Smith & Besharov, 2019; Smith & Lewis, 2011). Structurally, the model indicates that in the context of embracing two goals, the increased attention toward one goal increases the demands regarding another goal, which creates a tension between the two goals, wherein progress towards one goal requires sacrificing attentional resources towards the other. This structural paradox produces the risk of mission drift when the desired tasks no longer receive sufficient attention or when a cycle of oscillation arises.

The model thus contributes to strategic development when there are conflicting but interconnected logics. While the attention goals represent a potential intervention to establish the initial meeting's focus, the model suggests that the understanding of the structural dynamics is critical for sustaining attentional inflow toward social missions. Specifically, strategies to increase attention to sustainability should focus on the interconnections between different attention allocation mechanisms, and the strength of connections between the two logics. The existing strategies of managing competing tensions emphasise the adoption of both logics required by external institutional constituents (Jay, 2013; Oliver, 1991; Pache & Santos, 2010, 2021). It was proposed that decision-makers can acquiesce, compromise, avoid, or defy one institutional logic to increase the salience of the other institutional logic (see summary in CHAPTER 6, in particular Table 6-1). The strategic tendency when mitigating tensions is to defy (explicit rejection or removal of the institutional demands) or avoid (conceal nonconformity behind a facade of acquiescence through pure symbolic compliance) at least one institutional logic; however, the model shows that such strategies can fail. As the complexities arise from the structural interconnections, the attempt to completely remove the structural tensions can be challenging for hybrid organisations or actors that embrace multiple institutional logics. Especially when the structural tensions between the logics are strong, it can be difficult to resolve the conflict and identify a satisfactory solution by simply removing one of the logics.

Operationally, to effectively manage these mission drifts when managing competing institutional logics, it is important to recognise the structural tension between the two goals. This means creating a continuous flow of input towards both goals, even when progress towards one goal may appear to be counterproductive in relation to the other. However, if one demand strength from one logic is substantially higher than another one,

the strategy to simply increase meeting goal may also not be successful, as the meeting can be easily dominated by one specific institutional logic when the shifting attention mechanism kicks in. In the case of when demand strength of market is significantly higher, attention to social mission cannot catch up unless the goal of social mission is significant high. It is possible that achieving partial conformity with both institutional expectations through the mild alteration of the goals or responses can contribute to mitigating the persistence of tensions. However, the model shows that such strategies can only be effective when the demand strengths of logics are close to the other.

7.7.1.2 Temporal and contextual judgement

The ABV theory appears to view events and their salience as exogenous variables that trigger attention changes but cannot be influenced by the attentional outcomes (Hoffman & Ocasio, 2001; Shepherd et al., 2017). However, the model stresses the idea of shifting attention and situational judgement. Rather than acting as exogenous 'guardrails' to constrain mission drift Smith & Besharov, 2019), attention salience can be influenced by the context. In particular, the model shares the view that the insights and reflections regarding tensions appear to be critical to redefine strategies and goals (Dalpiaz et al., 2016), even during temporal moments in the meetings.

The model contributes to understanding the importance of situated decisions when there are tensions, highlighting the importance of the awareness of potential biases in attentional allocation. Situated decisions within a temporal tension period can be critical to trigger decision-makers' responses toward competing demands. The model reveals that while the goal formation process is critical to guiding the initial attentional allocation, ultimately it is the ongoing goals updating in the meetings that generates the inflow to the attention stocks. The temporal characteristics of the institutional logic's competition are critical, as they indicate that strategies to comply with specific contexts can reinforce the dominance of institutional logics. Consequently, individuals' recognition, perception, and experience relevant to tensions determine how they will make decisions using situated judgement (Hoffman & Ocasio, 2001; Smith & Lewis, 2011), which be critical for decision-making based on contextual demands.

Operationally, this model highlights the importance of understanding how individuals or organisations adopt and conform to a dominant institutional logic. It uncovers the risks of accepting the dominant institutional logics, often without questioning the underlying assumptions or values. Especially in the case of when the market attention dominates and the meeting deviates from the original social mission focus, the models shows that if

meeting participants does not react in time, the meeting can easily be dominated by market topics completely. On the other hand, if meeting participants react and attempts to bring back social mission topics, in the case of when the social mission is also perceived as an important focus, the attention to social mission can still catch up.

7.7.2 Contributions to system dynamics theoretical modelling

Qualitative analysis methods, such as grounded theory coding and thematic analysis, are frequently used in the SD field to aid the development of effective models. The foundation of SD is the feedback loops that interconnect the structure and rules and the system's behaviours (Morecroft, 1985). However, qualitative modelling that only focuses on causal relationships can potentially lose the dynamic perspective in connecting systems' structures and behaviours, which limits the potential of using qualitative methods to form a dynamic hypothesis of the target problem.

Previous SD theory models described how to conceptualise useful models from complex phenomenon or case studies (e.g., Larsen & Lomi, 2002; Repenning, 2002; Zhou & Zhang, 2022). The model contributes to SD theoretical modelling by reinforcing the integration of theoretical lens and case study learnings in simulation modelling. The development of a simulation model that focuses on generic challenges presented by the CLD helps to explore the primary tensions within the target problem without simulating the whole system. This narrow-down theory simulation approach contributes to the exploration of the synergy between qualitative and quantitative simulation modelling.

7.7.3 Implications for decision-making in urban regeneration

In practice, the HA confronts competing dynamics between attention to its social mission logic (logic A: sustainable and healthy housing) as opposed to market activities (logic B: market activities) in relation to regeneration. When social missions and market attention compete in the context of urban regeneration, it implies that there are conflicting institutional logics at play. There may be a social mission to address issues such as affordable housing, poverty, inequality, and environmental degradation. Conversely, there may be a market-oriented logic that prioritises profit and economic growth.

This model contributes to understanding how HAs manage the tensions relevant to urban regeneration and maximise the outcomes related to sustainability and health. Firstly, it is important to recognise and understand the underlying tensions between market and social missions and how they interact with each other, which involves engaging with diverse stakeholders and communities to identify shared values and goals, as well as recognising and addressing power dynamics that may favour one logic over the other. Additionally,

this may involve developing strategies that balance social and economic outcomes, such as using market mechanisms to support social goals or leveraging social capital to support economic development.

When market attention is dominant, while complying with social missions can be helpful, the embedded tensions between the market and social mission can still impose the risk of mission drifts. Considering the embedded tensions that HAs face as hybrid organisations, it is critical to adopt measures to ensure a balanced representation of different institutional logics. Successfully managing institutional competition in urban regeneration requires a nuanced understanding of the multiple, competing logics at play, as well as the ability to navigate and balance these logics in a manner that promotes both social and economic well-being.

Drawing from the model, some general justifications, and approaches to maintaining the health and sustainability considerations in the meetings were offered, which may assist HAs and private housing developers in understanding how to maintain the sustainability and health focus in projects meetings (see Table 7-3).

Table 7-3: Strategies to sustain attention to social missions in meetings.

Target attention mode	Strategies
Activating attention	• Make the agenda available relevant to the social missions explicit before the meeting • Ensure a reasonable balance of the attentional goals allocated to the social missions, market, and delivery issues • Facilitate a shared understanding that part of the meeting's focus is to understand and execute the social missions
Shifting attention	• Embed the discussions of social missions in the delivery activities • Increase decision-makers' vigilance in relation to noticing attentional shifts toward market activities, and make deliberate attempts to shift conversations toward social missions • Link the social mission's agenda to market agenda by mentioning co-benefits and interconnections between them
Adjusting attention	• Be aware of the impact of the meeting conversations on the meeting goals, especially when the meeting is dominated by the market conversations

	• Mention the meeting's goal when the meeting is dominated by market-related conversation

7.8 Limitations and next steps

7.8.1 Limitations and future research

The first limitation is that while the model allows us to explore how the group of meeting participants can shift or redirect attention, the role of decision-making power was not included. Consequently, the role of contestation and negotiation in influencing attentional reorientation is not fully clear. Group attention may differ from individual attention; group attention can be more diffuse and variable than individual attention, as it may be influenced by the goals and perspectives of different group members. Attention theories stress the role of 'contestations' between actors (Hoffman & Ocasio, 2001), while the paradox theory emphasises leaders' and top managers' roles in interpreting tensions (Smith, 2014; Smith & Tushman, 2005). Future research can look into the role of communication in group dynamics that shift the decision-making (Poole, 1983). For example, shifts in attention might also produce 'positive confrontations' and negotiations to achieve satisfactory results for both sides (Battilana et al., 2015).

Additionally, the model does not engage with specific behaviours in orienting attention. The research suggests that whether through defensiveness, synthesis and compromise, or negotiation, individuals' perceptions and responses are critical components of the dynamics in the models connecting tensions and organisational responses (Cholakova & Ravasi, 2019; Pache & Santos, 2021). For institutional theories, it remains unclear whether negations and contestations regarding trade-offs are necessary for harnessing selected logics (Battilana et al., 2015) or unnecessary to gain legitimacy or acceptance (Pache & Santos, 2013b). While the model highlights the impact of selection bias, individual responses and strategies were not considered. Future research can provide individuals with a range of insights to improve groups' attention to specific institutional logics.

Furthermore, there could be multiple attentional sub-categories under each logic or multiple sets of competing institutional logics rather than merely two. In the case study, social mission delivery encompasses two sub-categories: attention to sustainable housing and attention to healthy housing. The results of Chapter 5 showed that the perceptions of the two social missions' logics are different. Broader factors, such as routines, strategies, capacities, and individual beliefs, could indicate different strengths of triggers related to sub-level attentional categories. Future work can expand the generic structure to explore

more possibilities regarding the coupling of sub-categories of attention to logics, which could create either reinforcing or balancing loops on sub-levels. On the other hand, the model provides a basis structure to explain why delivering social mission goals (focusing on one of the logics) is challenging regardless of the specific social mission goal.

Lastly, the structural observations were grounded within the case study meeting observations. However, individual responses can be difficult to observe. For example, while shifting attention can be observed when participants overtly challenge or contest the norms imposed, dismissing, or ignoring cues is more subtle.

7.8.2 Next steps

In the qualitative analysis in CHAPTER 5, it was demonstrated that when the policy stringently focuses on specific goals, the decision-makers will reduce the number of social mission areas more than the mandatory requirements. On the application level, the planning systems require housing developers' attention toward health and sustainability and can impose strong impacts on decision-making. This chapter highlighted the importance of considering the structural tensions within urban regeneration, but the role of policy-making in influencing HAs' decision-making is unclear. The next chapter focuses on exploring the role of policies, interconnections between policies and decisions, and how systems methods can be used to support decision-making.

CHAPTER 8

Impacts and unintended consequences of policy on Housing Association's decision-making

8.1 Introduction

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). 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 high level of uncertainty, interconnectedness and dynamics that challenges simple solutions (Rittel & Webber, 1973). Therefore, for complex policy issues, an approach to identifying interventions 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 remaining limitedly explored (Foote et al., 2021).

Urban regeneration is greatly shaped by the policy and regulations, as summarised in CHAPTER 3. The case study found that policies and regulations impacted the focus of attention, across the planning and delivery stages in regeneration projects (see CHAPTER 5). HAs' goals in health and well-being, and especially sustainability goals are strongly impacted by the policy and regulation requirements, suggesting the role of well-designed policy in supporting the decision-making. However, within the policy design literature, tools to support exploration of the interconnections, trade-offs and unintended consequences of the focused policy issue is limited. Therefore, understanding how to incorporate systems-based policy design is also crucial for designing effective policy interventions.

Through a case study with two HAs in England, this chapter[9] aims to understand 1) the impact of policy on HAs' decision-making in regeneration; and 2) how GMB workshop, as a system thinking tool, can elicit complex causal mechanisms to facilitate policy design. GMB workshops were conducted with two large HAs based in England. This chapter presents a CLD derived from GMB workshops and the subsequent qualitative analysis of

[9] This chapter is adapted from a peer-reviewed paper (see the Published Paper Declaration) with only minor changes of the sections.

these workshops. The CLD highlights the underlying dynamics contributing to tensions between HAs' long-term and short-term decisions when there are disjointed and frequent policy changes.

The chapter is organised as follows. The first section introduces systems thinking in policy design and proposes a process model of incorporating causal mechanisms in policy design. Then the GMB workshop process and methods are summarised. Finally, the CLD elicited from the workshop is presented. Finally, policy levers basing on the proposed tool are summarised and discussed.

8.2 Systems perspectives policy design

This section explores how systems thinking could be elicited and incorporated into policy design. Firstly, it describes relevant research of causal mechanisms in policy design and OR field. Then it proposes the use of GMB and CLD to generate systems insights in policy design.

8.2.1 Causal mechanisms in policy design

Policy cycle is a multi-stage process including agenda-setting, policy formulation, decision-making, implementation, and evaluation (Howlett et al., 2017). Specifically, policy design is critical step to understand the links between policies and desired goals (Howlett & Mukherjee, 2018). Several factors such as information or knowledge gaps, a lack of resources, limited bureaucratic support, and political corruption can result in policy failures (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 & Howlett, 2019).

Capano and Howlett (2019) introduced a policy design tool with a mechanist perspective attempting better to 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 environment (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 the issue (Howlett, 2019; 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.

8.2.2 Causal mechanisms in operational research

In the soft operational research (OR) field, the exploration of causal mechanisms to form decision tools is a recurring interest (Alberto Franco, 2013; Eden & Ackermann, 2013; Mingers & Rosenhead, 2004). Researchers have used different types of problem structuring methods to elicit experts' knowledge and understanding of issues (Mingers & Rosenhead, 2004), such as cognitive mapping (Eden, 1988), facilitated modelling (Franco & Montibeller, 2010), and 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 workshops is a participatory modelling method involving stakeholders in the modelling process through group exercises (P. S. Hovmand et al., 2012). GMB workshops produce systems maps, such as CLDs and qualitative stock-and-flow structures, sometimes providing causal pathways for formal simulation models. 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 (Rouwette et al., 2002).

Various model-based approaches have been developed to support eliciting causal mechanisms from clients or stakeholders. For example, facilitated modelling is based on knowledge and structure problem statements (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 models 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 SD modelling, take an explicit on a systems perspective of causal mechanisms (Vennix et al., 1996). Specifically, CLDs are a set of causal loops and pathways elicited from participants to visualise the interconnections between variables in the system. Causal loops in system thinking 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 (Ackermann et al., 2010; Eker & Ilmola-Sheppard, 2020; Meadows, 2008; Morecroft, 1985, 1988; Zimmerman et al., 2018).

8.2.3 Embedding systems thinking in policy design

Wicked policy issues are often multidimensional and require structural and collaborative instead of simple solutions. Understanding actors' decision-making is significant as they decide the implementation of the policy design. An underlying assumption in policy design and OR tools is that the 'means/ends' chain depends on individuals and organisations' decisions and behaviours. For example, (Howlett & Mukherjee, 2018) argue for the importance of understanding institutional and behavioural contexts when designing policy interventions. They suggest that effectiveness of policy design depends on the decisions, knowledge, and interests of multiple actors in the problem environment. In the OR field arose 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)attempts to build bridges 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, decisions and behaviours are often endogenous in the system's causal mechanisms, being critical 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.

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. Scott et al., (2013) discovered that GMB sessions could trigger long-term changes in mental model refinement and alignment, but it can depend on the lessons directly from the qualitative workshop sessions. A critical step to facilitate the knowledge-building is to understand what insights can be generated from the causal maps, and how can systems perspectives be included in understanding good policy design. Analysis of loops is not new in the OR community. For example, analysis of cognitive

maps, which maps the hierarchy of goals, involves detecting the reinforcing and feedback loops in the system (Eden, 2004). This chapter argues that the system thinking lens can effectively explore the complex causal mechanisms of wicked policy issues, identifying the underlying drivers of first-order and second-order mechanisms within the system. Also, the success of policy design depends on relevant actors' implementation, as they decide if and how to bring in endogenous changes beneficial for resolving wicked policy issues, requiring the explicit exploration of organisational responses in policy design.

8.2.4 A systems-thinking based approach in policy design

The policy design literature was drawn to explore how the causal dynamics underlying elicited CLDs from GMB can be considered in the policy design. The policy design tool Capano & Howlett (2019) was adapted to highlight endogenous feedbacks in the causal mechanisms. The element 'tools' was replaced with 'systems interventions' to be specific about intervention points derived from the systems map. (Capano & 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. 'Behaviour' from the original design tool was replaced to 'organisational responses' to consider which organisational decisions and general responses would be influenced. Table 8-1 summarises the terms in the systems-based approach in policy design.

Table 8-1: Terms and definitions of policy design elements and loops.

	Term	Definition
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 systems model, 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 systems map
	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 the circularity in which a change of one variable loop back on itself after travelling the causal chain
	Reinforcing loops	Feedback loops that are self-reinforcing, indicating the change in one direction is compounded by more change. This will be detected when the number of negative causal signs (-) in the loop is even
	Balancing loops	Feedback loops that are self-correcting, indicating the change would counteract the change. This will be detected when the number of negative causal signs (-) in the loop is single

Figure 8–1 introduces the systems-thinking based policy design approach, and corresponding policy design elements. As the right part of the Figure 8–1 shows, the policy design elements include: policy outputs, organisational responses, causal mechanisms, loops influenced, systems interventions, and resources.

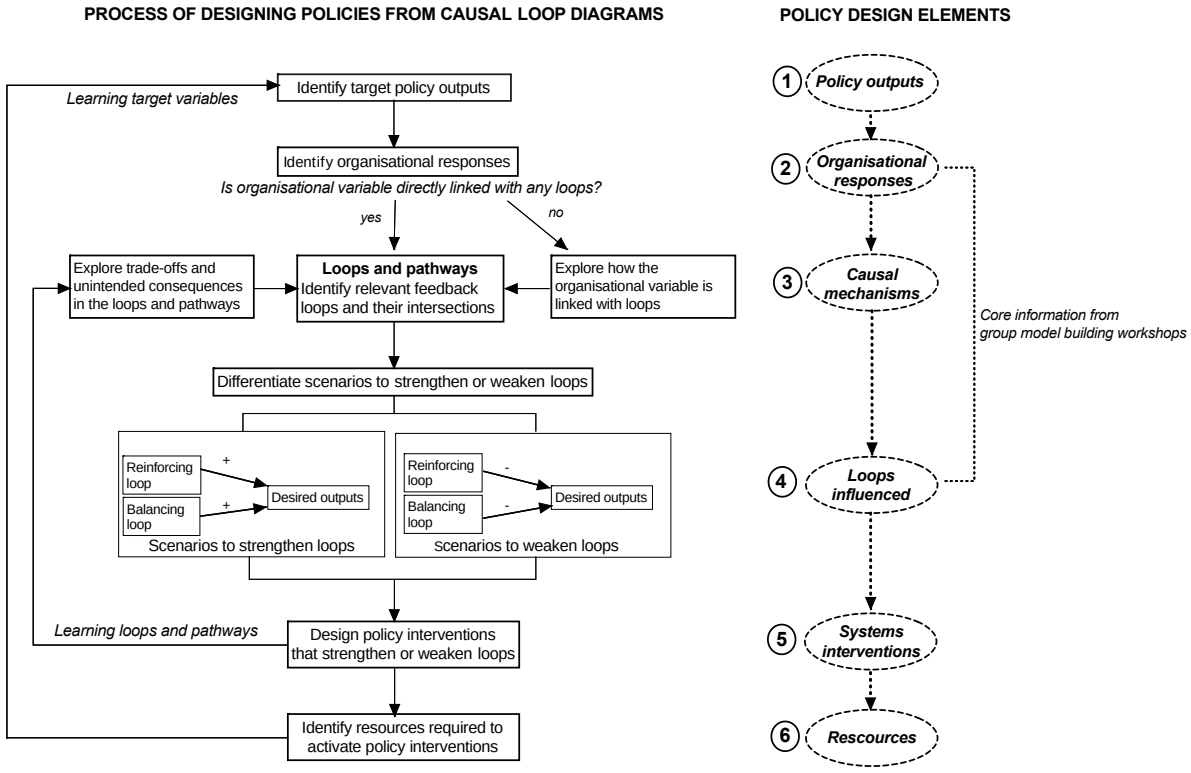


Figure 8–1: Systems-thinking based policy design approach. The right part of the figure shows elements of policy design adapted from Capano and Howlett (2019), whereas the left part outlines the process for analysing causal information from GMB workshops.

For the policy design process, it needs to 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 the simulation model, the pectisation of structure and the systems 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, scenarios to strengthen or weaken the loops need to be identified. 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. Interventions to strengthen loops increase the weighting and potential dominance of the loops. Interventions to weaken loops break the loop or decrease the weighting and potential dominance of the loops.

Finally, learning from the analysing process, which is a critical in GMB workshops, can generate new understandings of the target policy outputs, loops and pathways. New variables and connections can be added to the model to refine variables and loops. The process of policy design from CLDs embed the system structural information in identifying policy options. The next section describes the case study contexts and the workshop process.

8.3 Methods

The basis for methods has been outlined in the CHAPTER 4, specifically in section 4.6. As Figure 8–2 illustrates, the data collection for this part is a series of GMB workshops are conducted with two HAs.

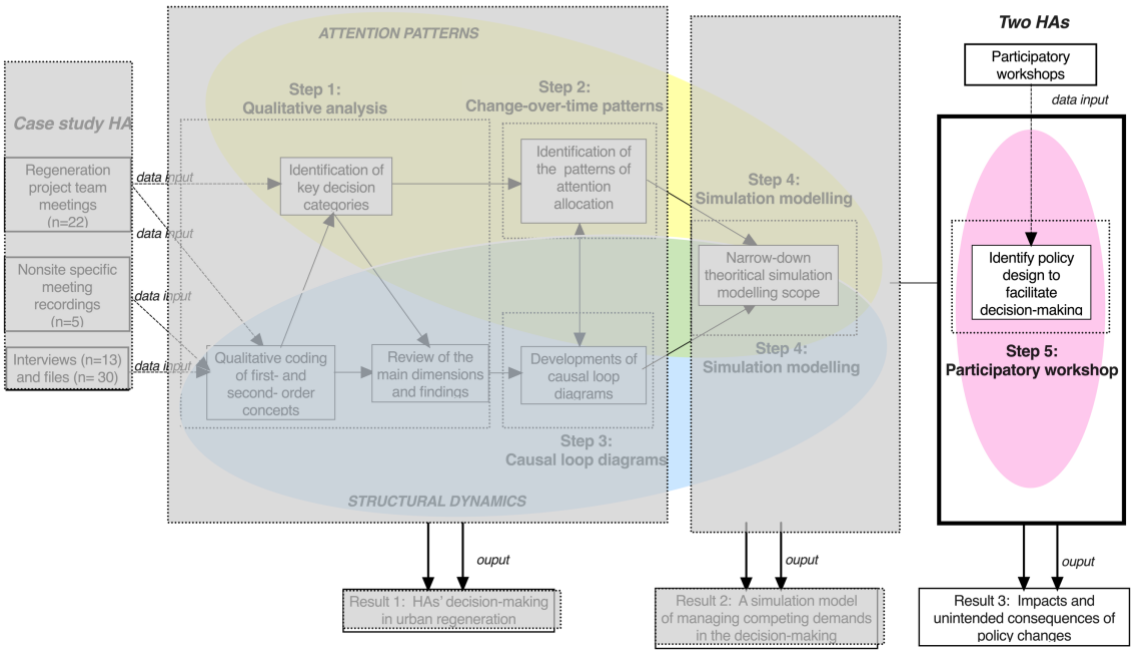


Figure 8–2: Version of Figure 4–4, highlighting the GMB part's methods

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. To suit the online format, a conventional full-day GMB workshop was adapted to a series of 60~90 minutes sessions (Table 8-2).

Table 8-2: 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 Mapping from seed structure
	3	November 2020	60 minutes	1 participant from HA-A	Variable elicitation 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
Model Validation	6	December 2020	60 minutes	4 participants from HA-A	Presentation and validation

Before the first workshop session, a 10-minute GMB introduction video was shared with participants introducing systems thinking and workshop information. The workshop's core questions were: (1) how do policies influence decision-makers' attention to and confidence in considering long-term health and sustainability goals versus short-term goals, and (2) how can the organisation increase confidence in long-term decision-making? Long-term decision-making relates to proactive decisions focusing on social, environmental, and economic ambitions.

The workshop sessions explored participants' perceptions of 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. Each session included a series of scripts adapted from Scriptapedia (Hovmand et al., 2011). Information on each script is presented in Table 8-3. Specifically, the first session was to 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 email to reach alignment. The script eliciting seed structure was used in the first session. 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, the script causal structure mapping was used, 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.

The data collection process was completed with the final session Model Validation presenting and validating the final CLD. The modelling process included two facilitators throughout the sessions. Themes and connections between different parts of the model were presented to participants throughout the sessions.

Table 8-3: 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 Stella 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 Stella Architect was used), 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.

The analysis started between GMB workshop sessions. Research in this stage aimed to compare and aggregate models to produce clear CLDs for the next sessions. This process involved reviewing recordings, checking the variable names, aggregating overlapping links, and simplifying the CLDs. After the final workshop session, which generated the final CLD, the leading modeller refined the final CLD to a qualitative CLD model highlighting the critical variable that connects the policies and organisational decision-making. The modeller identified the critical variable that provided the system with inertia and memory. 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 model are grounded on the CLD model developed at the workshop. Details of the final model 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.

8.4 Findings

A CLD was produced from the workshop sessions. The CLD captures six reinforcing loops that drive long-term and short-term decision-making dynamics in HAs' delivery of sustainability and health outputs in regeneration projects, as shown in Figure 8–3. Table 8-4 describes the main variables in the model. The map 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 decision-makers give to sustainability and health issues. Unlike the first output, which depicts the built environment level, the second output focuses on individual cognition level. The model unfolds from here.

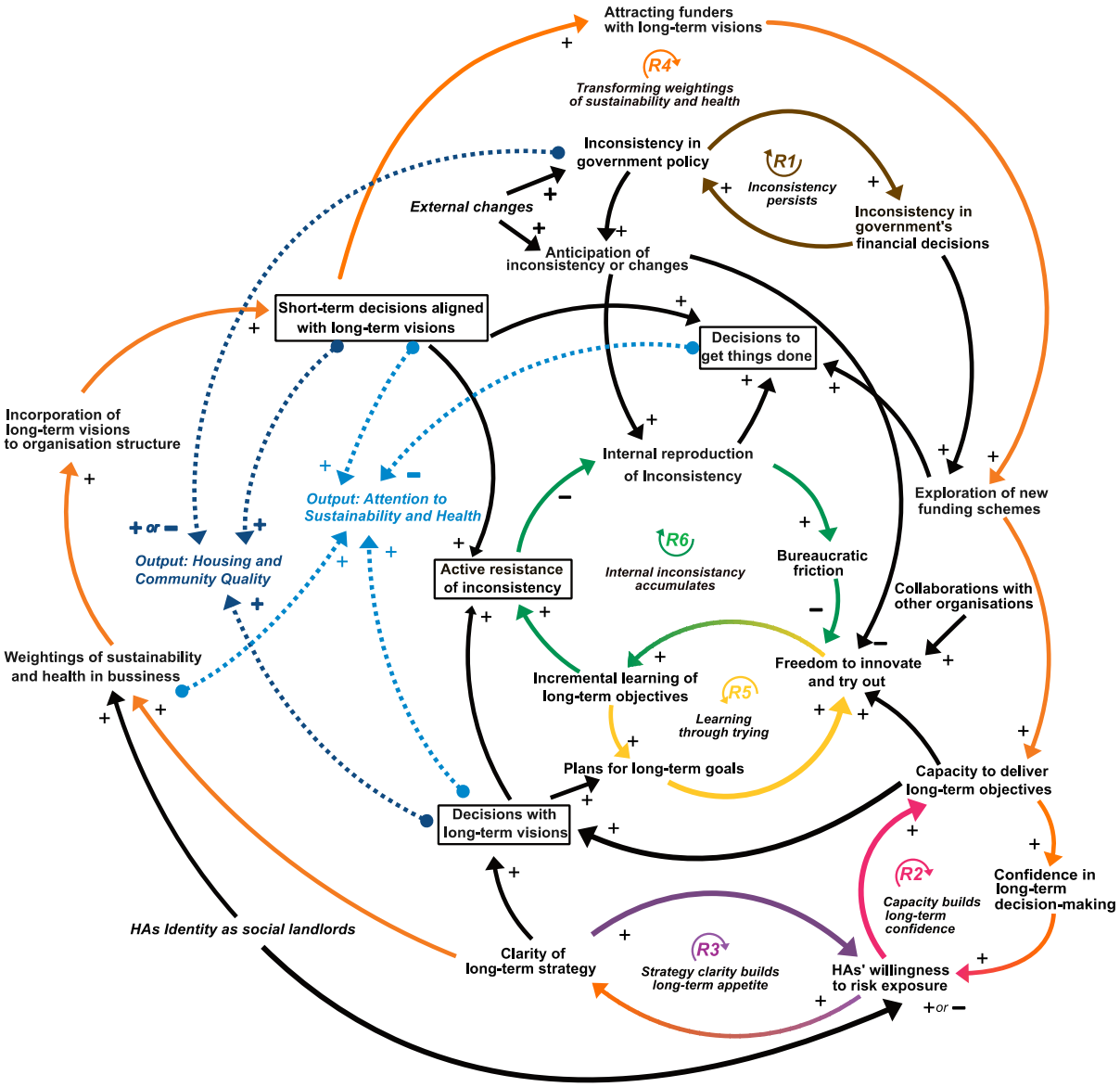


Figure 8–3: A CLD of the dynamics of housing policy changes and HAs' decision-making. Note: dotted lines represent links to the outputs. When polarities are labelled with "+ or -", this indicates that participants have expressed varying opinions regarding the causality associated with those policies.

Table 8-4: Definitions of main variables in the model. Note: quotations explaining the variables are included in appendix A 5.1 Variables and example quotations.

Variable in the model	Definitions
Active resistance of 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 decisions to resolve day-to-day or immediate issues
Decisions with long-term visions	Proactive decisions focusing on implications over the next few decades' horizons.
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 disjoint 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 disjoint 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	A category of short-term decisions that are relevant to 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

8.4.1 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 8-4). Inconsistent decisions are charactered by two features: 1) frequent changes of directions over a short-term time horizon; or 2) disjoint 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 be apparent 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."*

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 8-4) 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 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 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 push 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 pushes 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 link sign 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.

8.4.2 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 8-4) 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, a sign of *"+ or –"* was added 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: strategy clarity builds long-term appetite)*** describes another way to build long-term vision by increasing *clarity of long-term strategy* (see Table 8-4). 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 8-4). Strategy development was described as "what we want to do, to resist some of the pressures (of policy inconsistency)." Clear strategies not only suggest the "strategic direction" but also develop clear 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 itselves are often intangible. The ESG example earlier mentioned by HA-A suggests the benefits of reporting long-term decisions required by the new financing sources. ESG bonds underline the demand to deliver environmental and social principles, which pushes 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. Strategic level long-term decisions can only be achieved through "accumulations of positive short-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*.

8.4.3 Active resistance of 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 8-4). 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 build 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 trusted actors, 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, the variables discussed above are 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 the resistance 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. Table 8-5 summarises all loops with detailed description of the loops.

Table 8-5: Main feedback loops in the model

Loop ID	Loop name	Description of the loop
R1	Inconsistency persists	Policy inconsistencies incur from inconsistent government spending decisions, which increases policy inconsistency.
R2	Capacity builds long-term confidence	Capacity to deliver long-term objectives boosts confidence in long-term decision-making, increasing the organisation’s willingness (“appetite” as participants called) for financial exposure, which increases the capacity to deliver long-term objectives.
R3	Strategy clarity builds long-term appetite	Corporate strategy that clarifies the long-term direction increases the organisation’s willingness to financial exposure of delivering long-term goals, which in turn build up an increase of the organisation’s clarity of long-term strategy.
R4	Transforming weightings of sustainability and health	Weightings of sustainability and health increases short-term decisions that align with long-term vision, attracting the exploration of new funding schemes, facilitating incorporating long-term visions to decision-making.
R5	Learning through trying	Freedom to innovate and try out projects helps the organisation build up incremental learning on the delivery of long-term objectives, d increasing freedom to innovate.
R6	Internal inconsistency accumulates	Active resistance to inconsistency, building from long-term decisions and incremental learning, can decrease the internal reproduction of inconsistency, decreasing the bureaucratic friction against freedom to innovate, which increases the incremental learning from long-term delivery of objectives.

8.5 Discussion

A qualitative CLD was elicited, describing interconnections of housing policies and HAs' decision-making through participatory workshops with two HAs. This section first discusses influences of policy on HA's decision making, highlighting the importance of systems thinking in policy design. Then it discusses how systems-thinking based policy design can inform housing policy design. Finally, limitations and implications for future research are summarised.

8.5.1 Contributions to HA's decision-making in urban regeneration

The CLD revealed that inconsistent policy changes and HA's internal reproduction of policy changes are closely linked and influence HAs' decision-making. Inconsistency resulting from disruptive events or disjoint thinking has an accumulative nature. Accumulation of policy changes can create a memory in the system, manifesting itself in many forms such as conflictions in cultures and values, and tensions in long-term versus short-term decision-making, as the CLD suggests. In alignment with the research on HAs as hybrid organisations, which states HAs face contradictory institutional logics between delivering social outputs and addressing market efficiency (Battilana, 2018; Pache & Santos, 2013b), there are frequent or disjointed shifts in external policy and other changing environments can potentially drive HAs' decision-making towards a firefighting mode to respond to changes. Both HAs described a paradoxical approach to decision-making, transitioning between short-term and long-term modes of decision-making (Smith & Cunha, 2020). It was found that internal inconsistencies can further reinforce the tensions of values between market and social housing, restricting decision-makers' exploration of long-term objectives.

It was also found that disruptive changes can potentially create windows of opportunity as critical juncture moments, depending on if the HAs can build long-term visions for decision-making, transform business modes, and build active resistance to inconsistencies. 'Critical junctures' represent intersections of policy streams before new policy pathways or new streams dominate and open up options (Howlett et al., 2017).

Several loops (R2~R6) in the CLD suggest potential opportunities for incorporating long-term decision-making during policy change moments. However, the CLD suggests helping organisations build long-term financial capacity would be vital to introducing any transformative or new innovative changes to the system. Critically, strategic or capacity level change depends on the availability of funding. And the time needed in building capacity and learning and setting strategic directions can delay delivering desired social

outputs. Specifically, increasing strategy-level clarity and capacity, and building knowledge around long-term goals can generate more decisions with long-term visions in the future. In the meantime, decision-makers' anticipation of frequent changes can push decision-makers to focus on getting things done. This is aligned with the policy literature that policy changes can prevent 'policy lock-ins' by generating new policy pathways (Grabher, 1993)but can also risk sustained learning and creation (Moodysson et al., 2017).

Further, two unintended consequences of frequent policy changes were identified in the CLD: 1) pushing short-term decisions rather than long-term decision-making, and 2) potentially jeopardising the delivery of sustainability and health outputs. Firstly, the CLD showed that policy changes, although exogenous, can pose a relatively fast pressure to the system that the decision-makers need to respond to quickly, pushing towards a short-term focused decision-making trajectory. Regarding policy changes in the built environment, (Gallent & Carmona, 2004) suggested that planning policy changes may create a range of pressure points and frictions between housing providers and local planners across development stages. Competing government agenda 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, it was found that inconsistency in policy can potentially decrease the quality of sustainable and healthy housing if the HAs cannot build long-term visions into decision-making. The finding supports the literature that policy inconsistencies can risk the organisation's capacity to provide quality housing, or potentially worsening social housing affordability (Manzi & Morrison, 2018).

8.5.2 Contributions to system thinking based policy design

The CLD suggested that frequent policy changes can compromise HA's long-term decision-making and the delivery of healthy and sustainable homes. Therefore, effective policy design needs to consider the complex interconnections of policy outcomes, goals and HAs' decision-making. Based on the causal mechanisms from the CLD, points of interventions that need to be considered in policy design were suggested. Figure 8–4 summarises the main interventions points linking with the causal mechanisms from Figure 8–3.

Two policy outputs are considered here: housing and community quality, and HA's attention to sustainability and health. The achievements of these two policy outputs depend on which organisational responses HAs take: decision-making with long-term visions, short-term decisions aligned with long-term visions, and decisions only react to changes to get things done. The last decision-making mode can potentially introduce unintended consequences that comprise policy outputs. Figure 3 listed the critical causal mechanisms that need to be considered in policy design.

R1 and R6 are directly linked with the HAs' responses to disjoint and inconsistent policy changes. Weakening R1 and R6 can 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), the first intervention should 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.

The CLD revealed 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 weightings of long-term goals as a whole. Policymakers should 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 can facilitate HAs to increase capacity and confidence in long-term decision-making. Clear strategies that bridge the organisation's goals and policy targets can provide the vocabulary to communicate long-term objectives. Housing policy design should also consider the importance of learning and knowledge building.

The 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, this chapter argues policymakers need to synthesise and diffuse learnings across the sector. However, delays often characterise long-term decision-making pathways (Rahmandad, 2008). Building capacity, strategy and learnings all require aligned values and actions internally and take time. Thus, 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; Zimmerman et al., 2018).

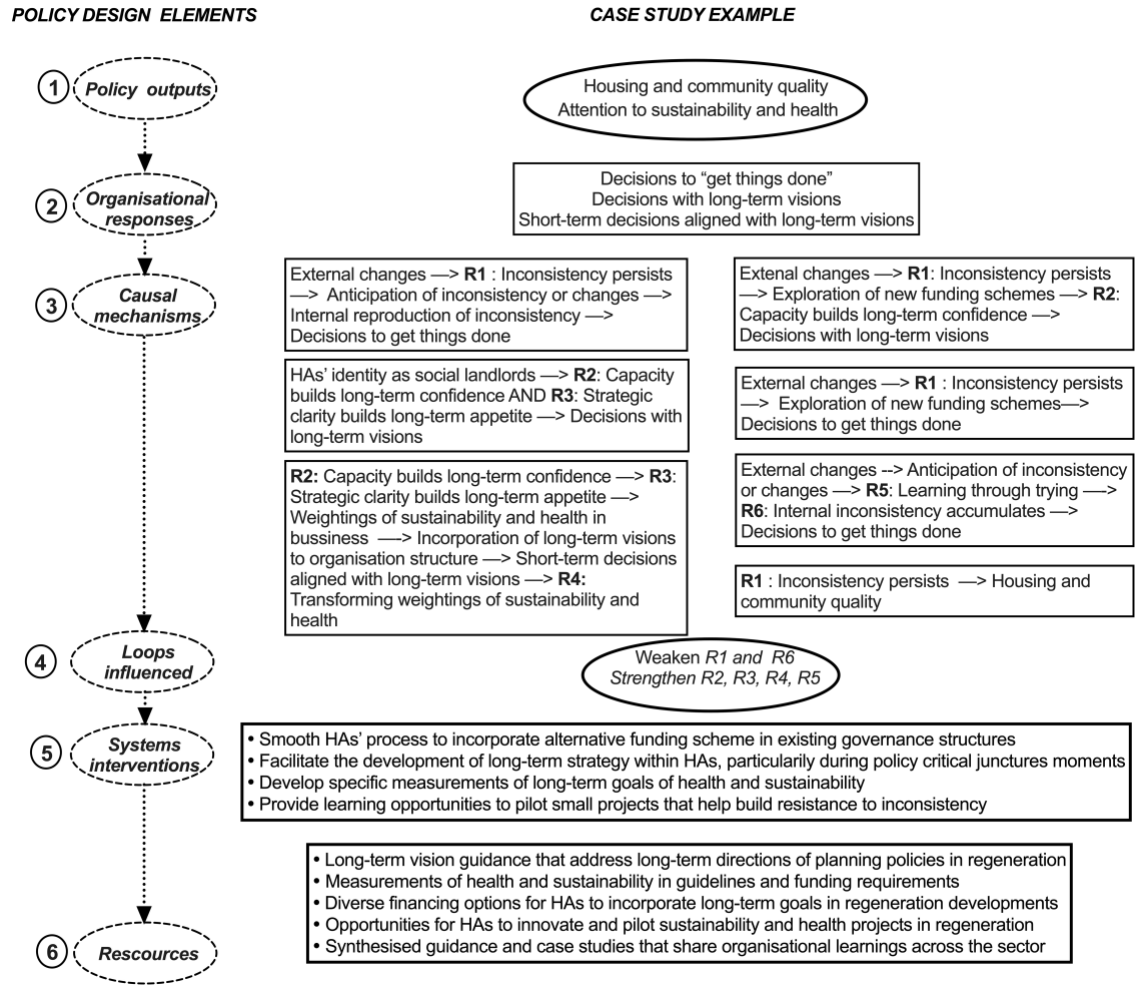


Figure 8–4: Systems-thinking based policy design: the HA case study example

8.6 Limitations and implications for future research

One limitation of the case study is that a small number of participants developed the systems map. 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., 2018). Thus the

systems map is useful and can be tested with other HAs in the sector. Another limitation is that the workshop did not focus on a specific housing policy, 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.

For future research, firstly, further investigation of the nature of policy changes and consequences on HAs' decision-making and policy outputs. In practice, while increasing consistency of spending decisions (as one of the interventions suggests) can facilitate HAs to follow the policy agenda more easily, it can be a more complex process in practice as any new government would attempt to fix problems in past policies. Therefore, future research can continue exploring the nature of policy changes on organisational decision-making. Also, The CLD cautions that rapid and inconsistent changes may push organisations to respond too quickly, jeopardising attention to sustainability and health in the long term. On the policy interventions 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.

A second critical area of future work is to test and refine the systems-thinking based policy design proposed in Figure 8-1. The result demonstrated that GMB workshops, as a systems thinking tool, can be an effective and practical approach to elicit causal mechanisms of complex policy issues such as urban health (e.g. Stave, 2010; Zimmermann et al., 2018). Further investigation of the activities proposed in Figure 8-1, especially the causal mechanisms, loops and systems interventions can be a key area to improve the tool's application in supporting policy design.

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, multiple short sessions were conducted 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. With the 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 (Zimmermann et al., 2021).

CHAPTER 9

Summary, discussion, and conclusion

This chapter summarises the research findings and provides an integrated view of how decisions and regeneration outcomes are interconnected from a systems perspective. It first combines and summarises the three empirical models and describes the critical dynamics identified, aiming to elucidate the overall complexity and connections of the three systemic models. It then describes the overall contributions. Finally, the chapter concludes with limitations and implications for future research.

9.1 Summary of three models

This section outlines the research findings from the three empirical models.

9.1.1 Connections of three models

The motivation of this research is to understand HA's decision-making in relation to regeneration. The results show that various aspects of urban regeneration (housing, neighbourhood conditions, socioeconomic interventions, and investment) compete for attentional resources in decision-making. Depending on how regeneration is approached, implications regarding sustainability and health are different in the long term. As summarised in the literature review in CHAPTER 2, multiple regeneration pathways can provide opportunities to improve outcomes, although the evidence can be mixed.

The thesis presented three models from empirical data. For the first part of the data collection, interviews, meetings, and files were collected and analysed to produce the results presented in CHAPTER 5 (model 1: qualitative, cross-systems urban regeneration and decision-making dynamics) and CHAPTER 7 (model 2: quantitative, theoretical modelling of managing competing decision-making). The findings revealed the complexities of how decision-making and regeneration outcomes interconnect with each other. Model 2 focused specifically on the primary tensions between social missions and financial efficiency in attention allocation, simulating the structural persistence of tensions and exploring strategies to mitigate the tensions.

Regarding the second part of the data collection, the GMB workshops and results were presented in CHAPTER 8 (model 3: qualitative, impacts and unintended consequences of policy changes). Model 3 focused on exploring the role of policies and regulations in depth and demonstrated that frequent policy planning changes might impair decisions regarding long-term visions.

Overall, as shown in Figure 9–1, the three models focused on different levels and aspects of decision-making: organisation-level decision-making, micro-level attention allocation, and macro-level policymaking; these overlap, but they also focus on different aspects of HAs' decision-making in relation to regeneration projects. The subsequent sections summarise the insights from each model.

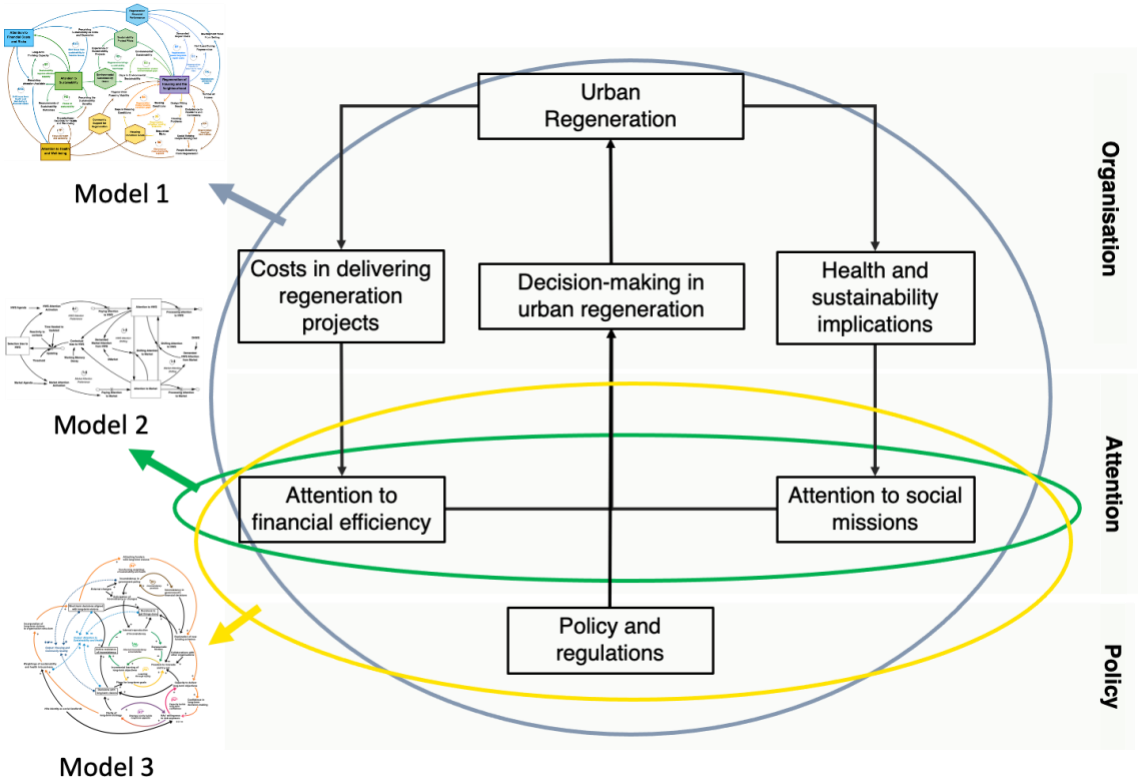


Figure 9–1: Synthesised insights from three systems models. Note: Model 1 is included in Chapter 5; Model 2 is included in Chapter 7; and Model 3 is included in Chapter 8. The circles represent the boundaries of each model.

9.1.2 Model 1: Organisation-level dynamics of decision-making in regeneration

The first model is a CLD presented in CHAPTER 5. Through interviews and meeting observations with a large English HA, attentional patterns of decision-making in relation to regeneration were elicited, revealing how attention changes over time as regeneration projects proceed. The analysis showed that attention toward the social mission (HWS) is not sustained as the regeneration project proceeds from the planning to the delivery stage, potentially risking the delivery of health and sustainability outcomes.

Model 1, a qualitative CLD, was developed with the aim of explaining the attentional patterns observed. The CLD focused on the interconnections between the underlying decision-making structures and the impact on HWS. One of the primary tensions identified is that regeneration activities require significant financial resources to execute

regeneration activities, which triggers attention toward financial activities. While attention to financial resources determines the project's viability, thereby influencing whether the regeneration project persists, the model revealed the complexity and risks of complete dominance of attention to market issues.

The model provided the empirical basis for linking regeneration impacts with attention allocation and highlighted the competition between attention toward social missions versus financial efficiency, as well as the internal dynamics between health and sustainability. It showed that sustainability issues, in comparison to HW issues, were perceived as 'extra' and 'expensive'. The model highlighted the importance of understanding the feedback relationships between the 'decision-making' system and 'place-making' system. And it suggested that, although policy and organisational strategies present strong goals activating for attention allocation, the fundamental conflicts and tensions between social mission and market also strongly impact the place-based approaches to urban revitalisation.

9.1.3 Model 2: Micro level of competing institutional logics in attention allocation

The complexities of interconnections and tensions between decision-making and place-making systems highlight the importance of managing competing demands. Model 1 showed that the competition between attention towards either social or efficiency logic is fundamental in the decisions sector, as attention is a limited resource in the context of decision-making. Based on the theoretical models and the qualitative results from the case study HA and the theories, model 2, a theoretical simulation model focusing on the micro attentional allocation level, was developed in CHAPTER 7 to explore the management of competing demands between social missions and financial efficiency.

Model 2 included three mechanisms of attention allocation: selecting and processing, sustaining, and shifting attention. It helped to understand how structural dynamics lead to tensions in decision-making when there are competing attentional demands (social missions, including HWS versus market demands). The model showed that structural connections between decision-related demands result in oscillations in decision-making, whether there is a meeting agenda or not, or whether the HWS goals are high or not. The model also showed that situated judgement in meeting contexts is important, especially when there are significant deviations of group attention.

For strategies to sustain attention to HWS, the model showed that it is critical to understand the underlying tensions between market and social missions and how they interact with each other. While it is possible that achieving partial conformity with both

goals, the model demonstrated that such strategies can only be effective when the demand strength of each logic is close to the other. When market attention dominates, attention to HWS can potentially catch up if the demand strength is relatively high. For regeneration projects, diverse stakeholders and communities need to be engaged with to identify shared values and goals. The model highlighted the importance for HAs to navigate and balance these logics in a manner that promotes both social and economic well-being. Considering the embedded tensions that HAs face as hybrid organisations, it is critical to adopt strategies to support HAs on balanced representation of different institutional logics in regeneration projects.

9.1.4 Model 3: Macro level of policies' impact on decision-making regarding regeneration

Model 3, which is presented in CHAPTER 8, focused on the role of policies in shaping HAs' decision-making regarding regeneration. The model was developed through a GMB workshop with two HAs, with the aim to understand how policies impact HAs' decision-making and how to design policies with a systems approach.

Consistent with model 1, policy influence was found to be one of the main areas influencing HAs' decision-making. The CLD illustrated how frequent policy changes and disjointed objectives could create disruptive challenges regarding HA's long-term decision-making, increasing short-term decision-making and compromising the delivery of housing policy goals as an unintended consequence. The model revealed the impact of policies and how frequent changes in policies can compromise long-term decision-making. The model also helped to explore how systems thinking workshops, as a system thinking tool, can elicit complex causal mechanisms to facilitate policy design.

The CLD contributed to the housing policy literature by explicitly demonstrating how policy changes affect HA's decision-making. By explaining how systems thinking methodologies provide insights into the nature of decision-making, the method further promoted the merging of the soft OR and policy design domains.

Overall, the HA case study and workshops revealed rich decision-making dynamics related to institutional logics and highlighted the importance of systems investigations at multiple levels. The three models answered the RQs with different level of analysis. Table 9-1 outlines the research findings in relation to the RQs. In the following sections, the contributions are summarised.

Table 9-1: Summary of research findings, linking with RQs

RQs	Research findings	Chapter
What are the dynamics of decision-making regarding urban regeneration across project stages? **How does HAs' decision-making in the context of regeneration projects relate to sustainability and health goals?**	• Housing design, neighbourhood design, socioeconomic interventions in deprived areas, and the strength of investments contribute to better regeneration outcomes, but the direct impact on health is mixed.	2
	• There are seven types of topics requiring decisions: environmental sustainability, health, and well-being, community engagement, housing design, policy compliance and operational management in regeneration project meetings and as suggested by interviewees. • There were a few tensions in decision-making, including the following: 1) determining the prioritisation of financial efficiency or social missions; 2) responding to the minimal pressure regarding sustainability or going beyond this; and 3) balancing the need between health and sustainability or focusing on one over another.	5
	• Frequent policy changes can compromise HA's long-term decision-making and the delivery of healthy and sustainable homes.	8
How do HAs allocate their attention in the context of urban regeneration?	• While attention to social missions (health, wellbeing, and sustainability) contributed to the impact of regeneration, considerations of financial viability can potentially shift attention towards project viability and financial efficiency. The two dominating institutional logics, namely social mission versus market logic, compete for the decision-maker's attention. • Decision-makers devoted greater attention to the health and well-being topics in early-stage project meetings compared to delivery-stage project meetings. In comparison, the social mission logic did not dominate at the delivery stage of regeneration meetings, even though there were moments of increased attention. • There was a paradoxical focus on sustainability and health. When the decision-makers were pressured to reduce the social mission issues more than mandatorily needed, it impacted sustainability to a greater extent than in conventional social missions. • For environmental topics, sustainability is not merely about environmental aspects but also concerns the interconnection between people and nature. However, attention to sustainability topics remained comparatively limited throughout the meetings.	5

How can decision-makers' attention to sustainability and health be sustained?	• The process of synthesising information, developing specific goals, and adjusting the weights of multiple goals in decision-making are key decision rules. Regulations and leadership were presented as critical forces to drive decision-making, especially for sustainability issues. Building insights through pilot projects facilitated the adoption of new ideas in social missions.	5
	• Multiple theoretical lenses can help explain the presence of the competing institutional logics identified in regeneration projects. Multiplicity, contradictions, interrelatedness, and persistence characterise the structural dynamics of decision-making when there are competing demands, such as social missions versus financial efficiency.	6
	• While the attention goals are a potential intervention to set the initial meeting focus, the model suggests that an understanding of the structural dynamics is critical for sustaining attentional inflow to social missions. • Strategies to increase attention to sustainability should focus on the interconnections of different attention modes, and the demand strength between various logics. • In the case of high HWS goals, there can still be risks of mission drifts if the demand strength of market attention is significantly high. The risks can be cascaded if meeting participants allow for the shifting conversations from HWS items towards market issues. • In the case of when the market attention dominates and the meeting deviates from the original social mission focus, if meeting participants react and attempt to bring back social mission topics, in the case of when the social mission is also perceived as an important focus, the attention to social mission can potentially catch up.	7
How do external policies influence HAs' decision-making?	• The GMB workshop with two HAs revealed that inconsistent policy changes and the HAs' internal reproduction of policy changes are closely linked and that they influence HAs' decision-making. Inconsistencies resulting from disruptive events or disjointed thinking have an accumulative nature. • Disruptive changes can potentially create windows of opportunity as critical juncture moments, depending on whether the HAs can build long-term visions for decision-making, transform business modes, and build active resistance to inconsistencies. • Effective policy design needs to consider the complex interconnections between policy outcomes and goals and HAs' decision-making. Based on the causal mechanisms from the CLD, points of intervention that need to be considered in policy design were suggested.	8

9.2 Contributions to decision-making in urban environments

The overall research basis of these studies assumes that enhanced knowledge of the systemic complexity can improve the outcomes of interventions.

9.2.1 Decision-making and systems approaches in regeneration

Increasing research regarding urban environments has focused on the trajectories or pathways of health and wellbeing (Gibson et al., 2011; Walthery et al., 2015) and the co-benefits of sustainability and health (Wilkinson et al., 2007, 2009; Willand et al., 2015). The complexity of the built environment highlights the potential unintended consequences of planning policies that focus narrowly on one aspect of the system (Shrubsole et al., 2014), stressing the directions of the integrated management (Macmillan et al., 2016) and the development of indicators in supporting decision-making in urban environments (Hemphill, Berry, et al., 2004; Hemphill, McGreal, et al., 2004; Maccagnan et al., 2019; Pineo et al., 2018). However, these studies do not underlie decision-making tensions beyond the complex interconnections between various aspects of urban systems.

This study contributes to urban environment decision-making by highlighting the complexities and dynamics involved in well-being and sustainability outcomes, with a specific focus on decision-makers' attentional allocation structures. As suggested in the decision-impact pathway (see CHAPTER 2), the evidence of health-and well-being outcomes in regeneration is mixed, but there are promising areas that can help improve the outcomes such as focusing on housing and neighbourhood quality, socioeconomic initiatives and investment strength for deprived areas. The complexity presented in the pathways stress the idea that decision-makers need to give sustained attention to the social mission areas in regeneration initiatives. In this sense, in urban regeneration, organisations are expected to satisfy multiple and often-conflicting requirements regarding a wide range of topics, and a narrow focus can result in failures in other areas.

This study contributes to moving towards systems approaches in urban environment decision-making. The three models, from organisational, cognitive, and policy level all proposed strategies to sustain decision-makers' attention to the social mission side. Specifically, to achieve outcomes in regeneration, decision-makers must develop the capacity to understand the complexities or interconnections between various aspects of regeneration. And policymakers will need to consider the systems-level complexity when designing the policy goals. While the insights were gleaned from regeneration projects,

the findings can help understand the interconnections between the system of attention-allocation and the system of urban interventions when there are contradictory demands.

9.2.2 Structural tensions and mission drifts in place-making

Research regarding managing sustainability in urban environments has focused mostly on the tensions between social, environmental, and economic goals (Van der Byl et al., 2020). The delivery of sustainable and healthy urban projects requires strong cognition, values, and beliefs favouring environmental issues (Henry & Dietz, 2012). Research has suggested the risks of mission drifts when projects or actors fail to achieve the intended results (Ebrahim et al., 2014; Ometto et al., 2019), but it does not explain how that tensions arise from multiple needs and how decisions can favour the intended outcomes.

This research contributes to understanding the importance and strategies in elucidating the tensions in systems-based approaches to urban regeneration. The study supports the idea that the competing institutional logics between social missions and markets enact and filter into the regeneration projects related to place-making (Slawinski & Bansal, 2017). The three models revealed not only the trajectory, but the structural complexities of urban regeneration involved in multiple aspects in urban environment management. Model 1 and 2 shows that the structural tensions can cause persistent oscillations and that following the goals is not sufficient to sustain the attention toward the intended goals. Model 3 reveals that the policies and regulations not only change the goals of urban regeneration but can also prompt decisions that focus on short-term changes instead of long-term changes, due to the structural complexities in organisations' decision-making. While urban regeneration indicators were proposed to support prioritising goals (Hemphill, Berry, et al., 2004; Huang et al., 2020), this research argues that it is highly critical to understand the structures in the decision-making system that impact place-making elements.

9.3 Contributions to conceptualising hybridity and competing tensions

Previous research has suggested that the tensions of competing institutional demands are persistent (Greenwood et al., 2011; Jay, 2013; Pache & Santos, 2013b). Research in the field of institutional analysis has focused on either individuals' perceptions and responses (Bertels & Lawrence, 2016; Cholakova & Ravasi, 2019; Martin et al., 2017) or strategy responses (Vermeulen et al., 2016). While emerging theoretical models have suggested that tensions, especially between social missions and market efficiency (Battilana & Dorado, 2010), are not only conflicting but also interconnected (Smith & Lewis, 2011),

they have not provided tools to test the proposed strategies that aim to avoid mission drift (Ebrahim et al., 2014; Ometto et al., 2019).

This research contributes to conceptualising hybridity and competing tensions in the organisational theory field. The three models help to theorise that underling causal mechanisms of hybridity and competing tensions at multiple levels. The structural complexity of the primary tensions in decision-making (social missions versus financial efficiency) can shift the trajectories of social missions, and enact in the organisational activities. The research highlights that the achievement of missions in responding to immense challenges must address the complexities of institutional logics and decision-making (George et al., 2016) .

9.4 Reflections of systems approaches in decision-making research

The study has illustrated three types of systems methods in decision-making research. This section outlines several key reflections regarding using systems methods in the field of decision-making.

Firstly, a systems approach to decision-making requires the exploration of how sub-systems interconnect. The models showed the complexities of various aspects that require people's attention at multiple levels. For this reason, I support the idea that decision-making and policy design must consider not only the goals of the system but also the overall structural complexity.

Secondly, a systems approach to environmental issues must consider the decision-systems underlying the target issues, including how attention resources, information flows, and perceptions of certain aspects of the system can be triggered and reinforced. The feedback structures between places and decisions stress the importance of employing the physical and tangible world (places, activities, and interventions), as well as intangible and cognitive resources in decision-making.

Thirdly, it is critical to link behavioural-level patterns with structural dynamics and identify the fundamental structures that contribute to dynamics. Rather than simulating the whole system, the primary tensions were chosen out of the qualitative CLD in the simulation modelling, and theory models were developed. The integration of change-over-time analysis, qualitative analysis, systems modelling, and workshops offers a promising approach to connect causal hypotheses and systems behaviours towards a dynamic hypothesis.

9.5 Limitations and Future research

The limitations and corresponding research directions have been described in the three empirical results chapters separately, linked with the focus of the knowledge content (see section 5.8, 7.8, and 8.6). This section summarises the overall limitations of the research design and implications for future search.

The first limitation is that the case study is grounded in the decision-making of HAs in housing regeneration projects. And the GMB workshops involves only two HAs based in the UK. In future research, further validations of the models with other organisations that has 'hybrid' natures such as different HAs, social entrepreneurship, non-profits, and public or private organisations attempting to integrate social missions into businesses (Billis, 2010) can validate whether the tensions in decision-making and strategies to mitigate unintended consequences can be applied to broader settings.

The second limitation is that it remains unclear how HAs' decision-making process and challenges can be applied to other key decision-makers in the sector, including private developers and local authorities. While the challenge of balancing sustainability development and costs can be applied to other actors in health urban developments (Pineo & Moore, 2021), the regeneration activities may be different and involve other complexities inherent to decision-making. Future research needs to consider other stakeholders' decision-making urban regeneration contexts.

The third limitation is that while a system-based policy design approach was proposed, and the strong role of policy has been suggested, the study did not directly engage with policy-makers. Emerging research in the built environment has demonstrated that participatory GMB workshops can facilitate decision-maker's understanding of complex interactions and support a systems perspective (Macmillan et al., 2016; Sharpe et al., 2018). Future research can apply systems model insights and investigate how direct engagement through participatory approaches with policy-makers (e.g., via workshops) can create awareness of attention allocation and how this may translate into institutional changes (Rouwette et al., 2002; Videira et al., 2011). Future research can also explore the role of systems tools in facilitating hybrid organisations' responses to institutional complexities.

Additionally, while decision-making tensions and challenges were addressed in this study, and strategies to mitigate the risks of mission drifts were suggested, it is unclear how these insights can be transferred to decision-making tools. Future research can further explore how to generate evidence-based information through decision-support tools.

Decision support tools, such as health impact analysis, social value analysis, and value-for-money calculators are increasingly used in urban planning to aid decision-making. It will thus be critical to understand whether such tools address the structural tensions in decision-making rather than merely shifting goals.

The last limitation is that the research was conducted during COVID-19. The qualitative data collection was delayed for over eight months, and the workshop planned was moved online to accommodate the locking-down regulations. Although the majority of regeneration meetings were observed between mid-2020 to mid-2021, the interviews were mainly collected in 2019 before the outbreak of COVID-19. Although the qualitative analysis synthesised the learnings from both interviews and meetings, it is unclear how COVID-19 impacted the HAs' decision-making. Although some results from the workshop analysis showed that disruptive changes such as COVID-19 directed the decision-making towards a short-term decision mode, the impact of pandemic was not the focus of the workshop discussion. Future research can explore how significant events like COVID-19 direct decision-making and if they act as 'critical junctures' that bring new policy streams and open up new pathways in urban regeneration (Howlett et al., 2017).

9.6 Conclusions

In concluding this study, the insights developed from the three systems models were synthesised. This thesis has contributed new knowledge about decision-making related to urban regeneration and strategies in mitigating contradictory yet interconnected decision demands. The research has also shown how GMB workshops can support policy-makers to understand organisations' decision-making and support HWS goals. The thesis has contributed to methodological developments integrating qualitative analysis, simulation modelling for theory developments, and GMB workshops for policy-making. The multi-level findings of this research will be of value to housing developers, planners, and decision-makers in the sector related to the urban environment.

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Appendix 1 Supplementary material for chapter 2

A1.1 Key pathways identified in the literature review

Programme	From A	To B	Relationship	Description from the source	Sources	Study ID
NDC	Housing improvement/ Interventions in deprived areas	Physical health (reducing smoking) , employment	+	"The likelihood of **quitting smoking, finding work and participating in education or training** increased steadily with increasing education."	(Stafford et al., 2008)	1
NDC	Interventions in deprived areas	Physical health (reducing smoking)	+	"The likelihood of smoking reduced between 2002 and 2008. Each 2-year advance in time was associated with a drop in the log-likelihood of **smoking** of −0.056 (95%CI −0.077 to −0.035)."	Stafford et al. 2014	2
NDC	Interventions in deprived areas	Education and qualifications	+	"The likelihood of having no **qualifications** declined over time in the reference group, declined more steeply in NDC intervention and NDC comparator areas and declined less steeply in HSE high-deprivation areas ."	Stafford et al. 2014	2
NDC	Housing improvement/ Interventions in deprived areas	Self-rated health	+	"There was a suggestion of a slightly steeper decline in the likelihood of poor **self-rated health** in NDC intervention areas though this did not attain statistical significance (p=0.09). "	Stafford et al. 2014	2
NDC	Interventions in deprived areas/ Housing improvement	Physical health (Mortality and mobility)	No significant change	"The study was not able to demonstrate any difference in **all-cause mortality and in morbidity association** with CHD or accidents either 'before and after' the implementation of the NDC initiative, nor between NDC areas and constructed control areas."	Cotterill et al. 2008	3
NDC	Interventions in deprived areas	Self-rated health	No significant change	"It was found that there was neither evidence of an overall improvement nor a worsening in **self-rated health** in NDC."	Walthery et al. 2015	4

NDC	Interventions in deprived areas	Life satisfaction	No significant change	"There was no evidence of overall change in **life satisfaction** in NDC or comparator areas."	Walthery et al. 2015	4
NDC	Interventions in deprived areas	Mental health	No significant change	"The slope coefficient of the **mental health** outcome was not statistically significant, indicating no overall change between 2002 and 2008 among residents of NDC areas as a whole."	Walthery et al. 2015	4
GoWell	Housing improvement	Recovery from circulatory conditions	+	"Those who had central heating are more likely (OR = 2.63) to have recovered from **circulatory conditions** between interviews than those who did not have central heating improvements. "	Curl and Kearns 2015	5
GoWell	Housing improvement	Recovery from mental health problems	+	"Fabric works were also associated with a higher likelihood of recovery from a **mental health condition** (anxiety, stress or depression)."	Curl and Kearns 2015	5
GoWell	Housing Improvement	Physical health	Mixed	"Fabric works were associated with a positive gain in **physical health** (+2.03, 95% CI 0.73 to 3.32), whereas central heating was associated with a negative change in physical health (−2.21, 95% CI −3.74 to −0.68). There were no significant interaction effects of the housing improvements on physical health. "	Curl et al., 2015	6
GoWell	Housing Improvement	Mental health	+	"**Mental health** improved slightly over time across the sample, the mean increase being +1.16 between T1 and T2, equivalent to a tenth of a SD."	Curl et al., 2015	6
GoWell	Housing Improvement	Mental health	+	"For the housing improvement group, we found evidence of a small improvement in **mean mental health** scores..."	Egan et al. 2013	7
GoWell	Housing Improvement	Physical health	No significant change	"For the housing improvement group, ... but little change in **physical health** scores relative to the control group."	Egan et al. 2013	7
GoWell	Investment	Mental health	+	"Between baseline and 5 year follow-up, mean SF-12v2 **mental health** scores had decreased by 0.09 in the lower investment group and risen by 1.31 and 3.39 in the medium and higher investment groups respectively."	Egan et al. 2016	8
SHARP	Relocation	Housing problems	-	"After moving there were significant reductions in the proportion of respondents **reporting such problems**."	Petticrew et al. 2009	9

SHARP	Relocation	Self-reported health	No significant change	"..., there was no association between change (increase, same, or decrease) in the number of **housing problems** reported, and **change in health** (worse, better, the same). "	Petticrew et al. 2009	9
SHARP	Antisocial behaviour	Neighbourhood satisfaction	+	"There was a significant increase in **neighbourhood satisfaction** compared with Baseline.... "	Petticrew et al. 2009	9
SHARP	Housing Improvement	Sleeping problems	-	"The only significant reduction was in the prevalence of people reporting **difficulty sleeping"**	Petticrew et al. 2009	9
SHARP	Housing Improvement/ Change of location	Mental health	+	"Changes in self-reported psychosocial benefits were greater than changes in **mental health**.. "	Kearns et al., 2011	10
SHARP	Location rehousing	Safety	+	"For those in adult-only households, improvements in **crime and safety** mattered most."	Kearns et al., 2011	10
Neighbourhoods Law in Catalonia	Public space	Satisfaction with the neighbouhood	+	"All groups also had similar positively perceived clusters related to **public spaces** with statements associated with the construction or repair of these spaces and buildings."	Mehdipanah et al., 2013	11
Neighbourhoods Law in Catalonia	Accessibility	Satisfaction with the neighbourhood	+	"Even though in recent years urban renewal projects had expanded plazas and created pedestrian friendly zones, participants complained about limited accessibility by car throughout the neighborhood."	Mehdipanah et al., 2013	11
Neighbourhoods Law in Catalonia	Investment	Self-rated health	+	"In the intervened group, poor **self-rated health** decreased significantly between 2006 and 2011 with PRyear=0.74 (95% CI 0.56 to 0.97) in women and PRyear = 0.53 (95% CI 0.36 to 0.78) in men."	Mehdipanah et al., 2014	12
Neighbourhoods Law in Catalonia	Investment	Health equality	+	"Within the intervened neighbourhoods, this decrease in **social class health inequalities** was driven by greater improvements in the manual class."	Mehdipanah et al., 2014	12
DDA	Socioeconomic interventions, Intensity of environmental interventions	Leisure time walking	+	"For **walking**, the trend in deprived target districts differed between the pre-intervention and intervention period. In the preintervention period, prevalence decreased from 72% in the first half of 2004 to 63% in the first half of 2008. In the intervention period, prevalence increased from 57% in the second half of 2008 to 70% in the second half of 2011."	Kramer el al. 2014	13

DDA	Intensity of environmental interventions	Mental health	+	"Those districts that implemented an intensive programme experienced an improvement in **mental health**, while residents of the comparably deprived control districts experienced a deterioration, resulting in a statistically significantly more positive trend change between the preintervention and intervention period in those target districts. "	Jongeneel-Grimen et al., 2016	14
NR	Investment	Trust towards government and sense of control	+	"There were statistically significant improvements in the level of **trust** for each of the three levels of government in the Corio Norlane NR group."	Shield et al. 2011	15
NR	Investment	Hope, influence and control over the future	+	"Respondents were asked about their agreement with statements relating to **hope, influence and control** over the future. When asked about whether or not respondents agreed that they had control over decisions made in their community, there were statistically significant positive trends in both NR groups."	Shield et al. 2011	15
NR	Interventions in deprived areas	Life satisfaction	+	"There was a significant interaction between time and changes in satisfaction levels for an NR involved group ...**life satisfaction** of an NR involved sample increased from time 1 to time 2, but the satisfaction of the LGA sample remained stable. "	Kelaher et al 2010	16
NR	Interventions in deprived areas	Health	+	"**Health status** of an NRi group increased from time 1 to time 2, but the health status of the LGA sample remained stable. The health status of an NRi group was slightly worse than an NRni group at time 1, but better than an NRni group at time 2."	Kelaher et al 2010	16

Appendix 2 Supplementary material for chapter 4

A2.1 Interview questions

1. Could you describe your role at [organisation] and your role within the [regeneration project] project?
2. How many years have you held this position at [organisation], and how long have you been involved in the project?
3. Could you begin by outlining [the organisation's] sustainability and health goals? Has the selection of these goals changed over the years?
4. Which parties are typically involved in the decision-making process for sustainable and healthy housing?
5. When it comes to achieving sustainability and health goals, what is the most challenging decision you're currently grappling with?
6. Faced with such a challenging decision, could you guide me through your decision-making process?
7. Who do you collaborate with regarding this decision, and why are their perspectives important? How do you engage in collaboration with these individuals?
8. Do conflicts arise during the decision-making process? If so, how do you navigate and balance those different or competing interests?

A2.2 Meeting coding examples

A2.2.1 Coding example 1

Site	Participants	Quotations	Time Segment	Codes
Site B	**Participant 1:** **Participant 2:**	… I think we've got [xx] (participant 3) on the call who is looking at phase 3 at the moment, so I don't know if you've got anything to add, [xx] (participant 3), on phase 3? [xx] (participant 3), if you want to just describe the work that we're doing around phase 3 now, just to try and make it a little bit more efficient.	Time30s	Focus: sustainable efficiency
	Participant 3:	Sure, so obviously, it's still very early days, but I've just joined the team to look at phase 3 and see if there's opportunities to make it more buildable and more efficient and a better residential scheme, but that's in a very early process at the moment and that will be the new […] development management team which has been newly established and project management team will be looking at that, so obviously, we'll keep in dialogue with yourselves as that progresses, but it's very early stages.	Time30s	Focus: sustainable efficiency Focus: housing and community quality Focus: programme and management
	Participant 2:	I think it's interesting, just from one of our internal discussions the other day, [xx] (the design team) haven't actually done very much with [xx] (the organisation) for a good while. It was obviously, as we talked about before, it was a very competitive bid process here, so our expectation and hope is that [xx] (the design team) do us a good job here, they won it against tight competition	Time30s	Focus: programme and management
		and the quality of their bid was what won it for them, so we're hopeful that we see them do a really good job here, we'll get a feel for that on this kick-off meeting tomorrow morning, just to see how they react. Their social value offer was pretty good, but there's quite a lot of work to do around that. We had a good conversation yesterday, internally, we think we can probably shape that	Time30s	Focus: programme and management Focus: social value Focus: programme and management

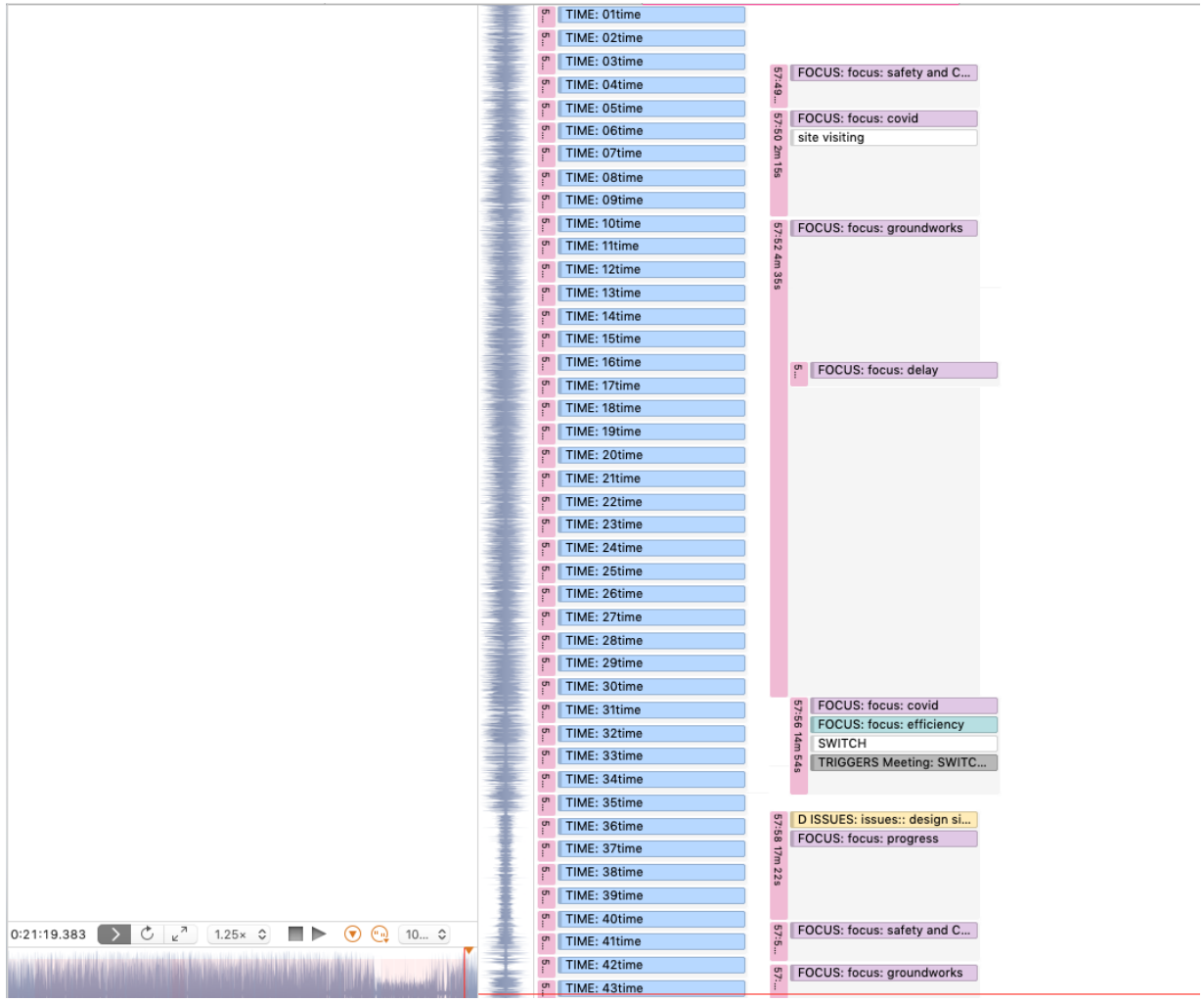
	Participant 4:	to be something that is maybe a better fit with what local residents want, so we'll gently be getting those conversations with [xx] (the design team) tomorrow morning, but it's good, we got the contract signed and we're good to go. So any questions for [xx] (participant 1) there, just around progress? Anything at all? No? Okay. So then we're on design access and decanting.	Time30s	Focus: programme and management
		Anything you want to pick up here? Only in terms of decanting. We are about to do some work around the housing needs, well updating the housing needs survey that we did much earlier for people now living in [xx](house name) House.	Time30s	Focus: housing need and demand

A2.2.2 Coding example 2

Site	Participants	Quotations	Time Segment	Codes
Site F	**Participant 1:** **Participant 2:** **Participant 3:**	… so structural work they are suggesting only gave us a life of 40 years, so the spending of that amount for 40 years is unlikely although obviously we need to review every simple option, but Okay. Will it only be 40 years or can they …?	Time30s	Focus: long term view
	Participant 1: **Participant 4:**	I guess yes we need to scope into that. What the cost then attach to 60 years, what is more of that for original cost, so we need to get into that, but I think what's quite going on is that when we met last time, a lot of that work does not last very long.	Time30s	Focus: project costs
	Participant 2:	So we got to be modelling where we are in terms of 30 years, that's already a life cycle, for 40 years we need to know what other costs it gives us. It might does not give us all but we just need to see what it looks like. I am surprised we are getting a 40 year life cycle.	Time30s	Focus: long-term vision Focus: project costs Focus: long-term vision

	Participant 4: **Participant 2:**	.. (inaudible) 20 or 25 years. Yeah yes (be)cause it's 50 year-old already. Can we picture a 90-year-old of that building?		
	Participant 3: **Participant 2:** **Participant 1:**	You are spending x millions of pounds for the building, you expect a reasonable amount of life. That's it, if you just build it now, we last 40 years isn't it? In terms of with the fire issues, will it last for 40 years? No. Okay, so… Another issue that	Time30s	Focus: project costs Focus: long-term vision
		… original there are three blocks, so two knocked down, I am not sure why, and his one remains and obviously it got handed over to us, I think when we took ownership of this, we assumed some of the structural work has been carried out, but once we have done the reviews, it seems that the council never did them.	Time30s	Focus: council involvement
	Participant 2: **Participant 1:** **Participant 2:**	So the cost now, have we bringing it the 2040 standard) strategy? No we have not done that yet. Okay we need to add that in now presumably.	Time30s	Focus: project costs Focus: organisation strategy
	Participant 4:	So I think today, really is about scoping out the project, getting the project team together, get some actions today to actually get people …. around the table to get partners for the project… One of the things that I am quite keen, and I spoke to x is about you know once we start to think about getting options, this is a very technical…	Time30s	Focus: project management

A2.2.3 Coding example 3 (voice file)



Appendix 3 Supplementary material for chapter 5

A3.1 Quotes of the seven types of topics requiring decisions

Decision issues	Definitions and example quotations
1. Environmental sustainability	Environmental impacts on nature from regenerating the area, including demolition, decanting, rebuilding activities, and neighbourhood sustainability topics, such as green spaces, tree planting, and energy efficiency.
	There's all the other kind of, it has to be zero carbon, it has to be free from plastics, it has to be all the stuff that's about, I guess, the materials and the energy, but ultimately, it's about us, as humans, connected to nature, so you feel connected to your neighbours, but also connected to nature. (S11, 2019)
	In terms of the building, I think we're working to the current legislation in terms of energy performance... One of the things we're looking to do as well, we're not having gas central heating in the property, so there will be no boilers, especially in the apartment blocks, so we're going to have an energy centre and we'll be having under floor heating, so that will be a lot better than what they have at the moment and the way the air circulates in the properties, the MVHR [Mechanical ventilation with Heat Recovery], that's what they're going to be doing, so we're going to be providing our own energy. (RM3, 2019)
2. Health and wellbeing	Housing and neighbourhood quality's influence on residents' physical health, mental health, and well-being and broader topics that focus on affordability, social connection and cohesion, deprivation, crime, and antisocial behaviours.
	We don't look at health as a standalone thing. What we do, when we design, we look at placemaking and we look at how we can design out any risk of crime, how we can make communities better integrated, how we can make public spaces that the people want to use. We look at the existing population and we say that there are a lot of children of that age, so we provide a lot of things for people of that age to do. How we approach it is more like what is a neighbourhood where people want to live, so it's about placemaking and obviously, all of those things will have a positive impact on health. (RM2, 2019)

		So if you can't afford to feed the meter in you E-F rated property, you are going to be really cold and you are going to get health problems and the thing that I wanted to pick up was that there was a virtuous circle in that. You can imagine someone who's on unemployment benefit, who's struggling, who can't necessarily afford to heat their home, they don't heat their home properly, they get sick, they miss a job interview, they lose their benefits, there's, potentially, a spiral effect in terms of poverty, so this is the sort of linkage between what we do on environmental sustainability and what we do on that and to be honest, while the link has been less... it was recognised in terms of the strategy that there are health and well-being benefits from picking up this environmental sustainability strategy. (S10, 2019)
		We have something called the super survey … about 2,000 of our residents who take part in this survey and then, from the survey results, we're able to gauge areas of deprivation, or where people are maybe struggling in certain ways which we can then look at to give us an idea of what the priorities should be. (C8, 2019)
		Also because the existing population are often overcrowded, so again in [site name] for example, one and three household are overcrowded, so we rehouse them in a home with the right size. Overcrowding is a big consideration. (RM1, 2021)
3.	**Community engagement**	Community and resident housing needs and engagement with residents throughout the regeneration project's demolition, decanting, and rebuilding process.
		The whole decant process at [site name] took five years or something, it's a relationship that we have to have with people during and after, when they eventually move in and so it's just a constant communication of asking, 'what does the council need in this area? What do people need out of the area?' It's constantly checking, 'can we try and meet everyone's priorities whilst actually making something that's viable? (RM4, 2020)
		in regeneration, it's difficult to think like that and to act like that because it's a huge risk to your project if you don't get the community on board because that's a material consideration for the planning officers and the planning committee, so when you submit your project, you are spending so much money up front to do with the community consultation, for all the design teams, to develop proposals, to put all the documentation together. You have a project manager, they do the cost, so you've spent all this money up front to go to a planning committee and then you suddenly realise that you have 20 objections and the community makes a riot and it's definitely not gonna happen, so you don't want to risk that, even if, let's say, you are a housing association that is not so community minded, it will be

	unreasonable for you to choose the truth because you need to make sure that people are satisfied and they are happy with the change. (D12, 2019)
	I really can only speak from that community investment, but I guess it's just that if you are moving people or you're moving their physical presence in that space, but also their connection with their community, so if they're being decanted, that can often lead to anxiety. (C9, 2020)
	In terms of buy-in, I mean the residents' support for what we were doing. Like I said, when we started, there was a lot of negative press in terms of regeneration as a whole, the whole gentrification, we're moving people out of London…so residents were clearly anxious and worried about what we were going to do based on what's been happening on other regeneration projects. (RM3, 2019)
4. Housing design	Design topics relevant to the housing layout, mixture, density, and spaces in the surrounding areas.
	In terms of health, we are going to be reducing over-crowding, so people are going to be in homes that are suitable for their housing needs. As you mentioned, we've got access for the balconies, there's going to be more usable outdoor space … so it's built like perimeter blocks, so within each perimeter block, there's going to be communal outdoor space that residents will have access to within that perimeter block, then you've got the big, outdoor park, the neighbourhood park and there's going to be facilities for young people and children, so access for play.(RM3, 2019)
	… we'll just double check on what the local authority's requirements are around housing mix, but the rest of it, parking's there, green space is there, heights are there, we've no overlooking issues, it should be relatively uncontentious from a planning perspective... (Meeting 13, site C)
	…so sometimes it's deliberate fine tuning because you put in a planning in 2016, you get approval 2018 and then the policy changes on what heating systems we all want to do to switch to zero carbon and so, suddenly, we all have to re-decide what we're going to do and we do that and we're like, 'okay, we've changed it now' and then the planning changes again, so there are natural shifts that we make or we are dictated by our own organisational changes and we have to decide, 'right guys, now we're no longer going to do bathrooms that

	are internal, we want bathrooms with external windows, these are in our employer's requirements, this is like the design elements that we prefer to retain' and so we will then have to re-submit new planning with these amended features. (RM4, 2020)
5. Policy compliance	National and local government policies and regulations regarding regeneration projects.
	It's a different scenario and we are a quite highly regulated business, so we have the social housing regulator, we have to conform to their rules in our licence to operate, effectively. We can't just go around throwing money around because we've got very strict controls about how that's done and we've got limitations as well, we can't just change our pricing structure for our customers, for residents because that's regulated, so we can't add costs on, so that limits what we do and we need to collaborate with government then to be able to make the improvements that we want to make, particularly in our housing stock. (S10, 2019)
	…What we ought to try and do is think about…, if we can prove that a policy compliant scheme would work with all these costs involved and after five years, is this what you're thinking? Do we think we could then deliver a policy compliant scheme with 35 per cent affordable for the remaining people who are still there because what you do is get a block, empty it, either refurb it or knock it down. (site C, meeting 08)
6. Operational management	Managing human resources, communication, procurement and contracting site appraisal and analysis, and project timeline and stages.
	for other projects within the organisation, there's much more formal mechanisms around something like that to happen, so in this organisation – particularly when it comes to stuff like sustainability – you will have investment committees and stuff like that which have much more formalised processes around what level of investment you put into these things and what shape these things take, what level of affordable housing. You have to know what level of private housing you have in there, so that's much more formalised. (SR7, 2019)
	… so if I'm procuring architects or engineers or even legal consultants, every procurement has a circular economy question in it. (RM1, 2019)

7.	**Financial viability and efficiency**	Considerations of costs, development value, and financial risks throughout the regeneration project. Evaluation of regeneration viability based on the economic value.

So the way the [site name] works is that in the early years, in the early phases, we were only re-housing the existing residents because that's our priority, we cannot build if we cannot move the residents around, so all the initial phases, we are just providing the homes for the existing residents, so there is not much revenue because either we're providing homes for the home owners or they provide homes at very low rent and it's only in the later phases that we sell, so the project runs at a loss for quite a few years, until income starts coming in and then, now, not only are we running at a loss for the initial few years, but the income that is supposed to start coming in in the second half has reduced because the house prices outlook is not that positive, so it's quite difficult because we carry a lot of debt in that initial year which cannot be recovered in the later years. (RM2, 2019)

I think it was a question about how much is this going to cost and I think there was a discussion about, I guess not so much on the direct cost, but the implications within our corporate strategy, particularly around our housebuilding ambitions, so that's primarily, when we make our surplus each year, that's directed – or the focus of that now is primarily on both improving our existing portfolio – but also on building new homes, that gives us the fire power to go out and build more new, particularly affordable, homes because we have to invest in that social benefit. Again, we're not a commercial housebuilder, we're not making profit for investors, we're making a surplus to return into our core, social purpose, so that puts us on a slightly different path, so we do need to be balanced. (S10, 2019)

A3.2 Code-occurrence data

A3.2.1 Code-occurrence table of decision-issues and time segments in the regeneration planning stage.

Note: The number of codes is marked in bold. The attention fraction is marked in italic.

Time	Health and well-being		Environmental sustainability		Community engagement		Housing design		Policy compliance		Operational management		Financial viability and efficiency		Total number of codes	Sum of fraction
10min	**69**	*0.22*	**4**	*0.01*	**21**	*0.07*	**89**	*0.29*	**41**	*0.13*	**43**	*0.14*	**43**	*0.14*	310	1.00
20min	**50**	*0.16*	**17**	*0.05*	**38**	*0.12*	**79**	*0.25*	**41**	*0.13*	**36**	*0.11*	**56**	*0.18*	317	1.00
30min	**18**	*0.09*	**0**	*0.00*	**26**	*0.14*	**48**	*0.25*	**7**	*0.04*	**43**	*0.23*	**49**	*0.26*	191	1.00
40min	**33**	*0.16*	**0**	*0.00*	**28**	*0.14*	**33**	*0.16*	**23**	*0.11*	**49**	*0.24*	**35**	*0.17*	201	1.00
50min	**16**	*0.15*	**14**	*0.13*	**12**	*0.11*	**20**	*0.19*	**1**	*0.01*	**30**	*0.28*	**15**	*0.14*	108	1.00
60min	**3**	*0.05*	**0**	*0.00*	**15**	*0.25*	**16**	*0.27*	**20**	*0.34*	**4**	*0.07*	**1**	*0.02*	59	1.00
70min	**5**	*0.12*	**0**	*0.00*	**14**	*0.33*	**17**	*0.40*	**2**	*0.05*	**3**	*0.07*	**1**	*0.02*	42	1.00

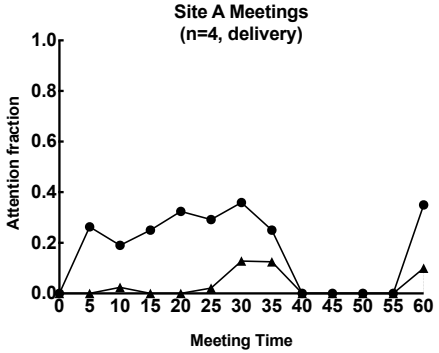
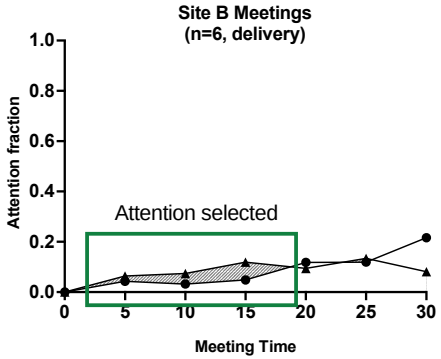
D.2 Code-occurrence table of decision-issues and time segments in the regeneration delivery stage. The number of codes is marked in bold. The attention fraction is marked in italic.

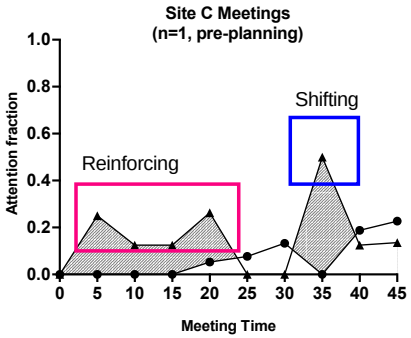
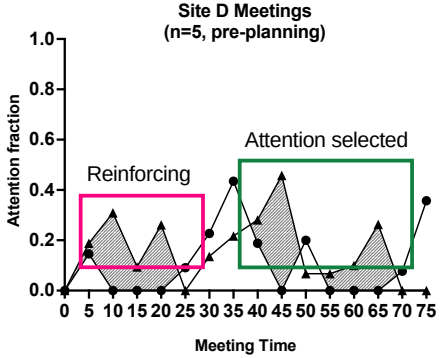
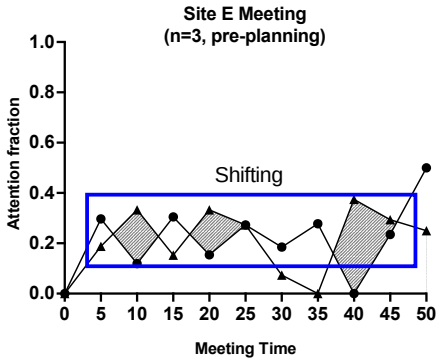
Time	Health and well-being		Environmental sustainability		Community engagement		Housing design		Policy compliance		Operational management		Financial viability and efficiency		Total number of codes	Sum of fraction
10min	**17**	*0.05*	**2**	*0.01*	**64**	*0.19*	**24**	*0.07*	**33**	*0.10*	**161**	*0.49*	**30**	*0.09*	331	1.00
20min	**17**	*0.06*	**8**	*0.03*	**68**	*0.23*	**24**	*0.08*	**43**	*0.14*	**106**	*0.35*	**33**	*0.11*	299	1.00
30min	**13**	*0.05*	**5**	*0.02*	**46**	*0.19*	**11**	*0.05*	**28**	*0.12*	**90**	*0.38*	**47**	*0.20*	240	1.00
40min	**6**	*0.12*	**2**	*0.04*	**4**	*0.08*	**3**	*0.06*	**8**	*0.16*	**19**	*0.39*	**7**	*0.14*	49	1.00
50min	**4**	*0.14*	**0**	*0.00*	**0**	*0.00*	**3**	*0.10*	**4**	*0.14*	**13**	*0.45*	**5**	*0.17*	29	1.00
60min	**2**	*0.07*	**0**	*0.00*	**8**	*0.28*	**3**	*0.10*	**3**	*0.10*	**6**	*0.21*	**7**	*0.24*	29	1.00

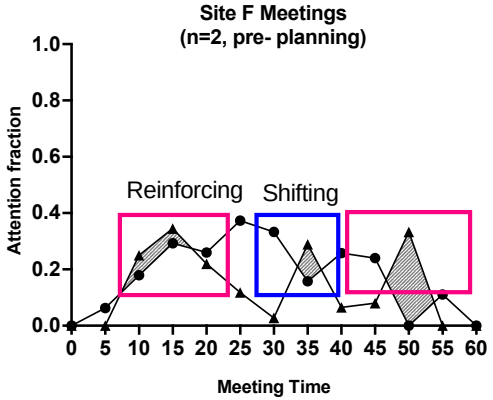
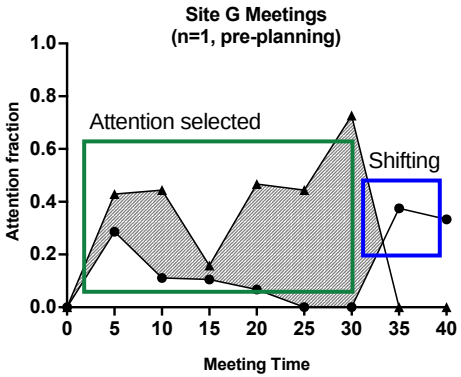
Appendix 4 Simulation model for chapter 7

A4.1 Explanations of attention patterns in site meetings.

Note: social mission logic (HWS) is marked by round dots; market logic is marked by triangle.

Site ID	Behaviours	Social Mission Dominance Behaviour	Attention pattern explanation
A		NA	• As sustainability conversations were strongly linked with the cost plan in different phases, the attention to market logic was building up. • The deficit status of the project and timeline were reviewed at the end of the meetings, increasing the attention to the market logic.
B		The dominance of attention to social mission from meeting start to 20 min	• Progress updates regarding affordable housing plans contributed to the growth of attention at the beginning. • Other agendas include community garden, and parking sites plan. When the meetings progressed towards the end, the agenda moved to the financial side updates, contributing to the growth of market attention. • Typical meeting numbers: meeting 12 & 23

C		Sustained attention to the social mission at the initial 23 min	• At the initial 15 min, costs and financial issues were not mentioned. Instead, the conversation was dominated by the social matrix (selective attention) and the operational details of the social matrix, consultants, projects, and timeline (reinforcing the selective attention through conversations).
		The dominance of attention to the social mission at 35 min	• At the end of the meeting, the issue of aged boilers was raised when the agenda (selective attention) moved to 'estate management'. The attention was shifted and reinforced through conversations.
D		Initial sustained attention to social mission attention from 0~25 min	• The attention to social mission is reinforced with questions and discussions, in particular for meeting 21.
		Two segments of the dominance of attention to social mission from 40~50 min, and 55~70 min	• At 45min, the agenda of ageing-friendly and the circular economy agenda was introduced when the conversation moves to specific site management concerns.
E		Shifts of attention between 5~25min, The dominance of attention at 40min	• The meetings started to discuss the percentage of affordable homes in the scheme. In meetings the shifting patterns were observed, in particular for meeting 08 and 13.

F		Dominance of attention during 10~20min	• The increase of social mission logic started when one member said, "there is a community centre", and "tube stations nearby", focusing the discussion on neighbourhood facilities. • Other meetings also started with an overview of sites. The overview generated follow-up questions (reinforcing attention), including how to provide temporary substations before the new buildings are built.
		Dominance of attention at 35min	• The discussion focused on comparing regeneration and refurbishment options through cost modelling. A member asked about the parking (selective attention), which generated conversations on "carbon zero", and reinforced the focus.
G		Dominance of attention throughout the first 30 min of the meeting	• The meeting started with a list of agenda about the housing conditions, percentages of long-term voids, and housing quality compared to the housing standards. • The shift was because of a question about the green space responsibility, which directed the conversations to percentages of leasehold, freehold, and shared ownership.

A4.2 Model technical documentation

```
**********
Agenda_Sector:
**********
Agenda(t) = Agenda(t - dt) + (AgendaInflow - AgendaOutflow) * dt
   INIT Agenda = 0
   UNITS: dmnl
AGENDA_SWITCH = 0
   UNITS: dmnl
AgendaInflow = PULSE(Max_Amplitude_of_Stimuli, AgendaStartTime,
Intervals_Between_HWS_Stimuli)
   UNITS: per minute
AgendaOutflow = PULSE(Max_Amplitude_of_Stimuli,
AgendaStartTime+Intervals_Between_HWS_Stimuli/2, Intervals_Between_HWS_Stimuli)
   UNITS: per minute
AgendaStartTime = 10
   UNITS: min
HWS_Activiation = (1-AGENDA_SWITCH)*SelectionBias_ToHWS+ MAX(0,
HWS_Agenda)*AGENDA_SWITCH*HWS_Agenda*SelectionBias_ToHWS
   UNITS: dmnl
HWS_Agenda =  -SIN(3.1415*(TIME)/
Intervals_Between_HWS_Stimuli*2)*Max_Amplitude_of_Stimuli
{STEP(Max_Amplitude_of_Stimuli, Intervals_Between_HWS_Stimuli) }
   UNITS: dmnl
Intervals_Between_HWS_Stimuli = 20
   UNITS: min
MarketActivation = (1-
AGENDA_SWITCH)*SelectionBiasToMarket+AGENDA_SWITCH*MAX(0,
MarketAgenda)*SelectionBiasToMarket
   UNITS: dmnl
MarketAgenda = -HWS_Agenda
   UNITS: dmnl
Max_Amplitude_of_Stimuli = 1
   UNITS: dmnl

**********
Attention_Allocation_Sector:
**********
Attention_to_HWS(t) = Attention_to_HWS(t - dt) + (PayingAttentionToHWS +
Shifting_Attention_from_Market_to_HWS - ProcessingAttentionToHWS -
Shifting_Attention_from_HWS_to_Market) * dt
   INIT Attention_to_HWS = 0
   UNITS: Attention Units/min
Attention_to_Market(t) = Attention_to_Market(t - dt) + (PayingAttention_toMarket +
Shifting_Attention_from_HWS_to_Market - ProcessingAttention_toMarket -
Shifting_Attention_from_Market_to_HWS) * dt
   INIT Attention_to_Market = 0
   UNITS: Attention Units/min
```

AttentionShift_AT = 10
   UNITS: min
DelayOrder = 3
   UNITS: dmnl
DemandAttention[HWS] = SMTHN(Attention_to_Market*DSHWS, Perception_AT,
DelayOrder)
   UNITS: Attention Units/min
DemandAttention[Market] = SMTHN(Attention_to_HWS*DSMarket, Perception_AT,
DelayOrder)
   UNITS: Attention Units/min
DemandedHWS_Attention = DemandAttention[HWS]
   UNITS: Attention Units/min
DemandedMarket_Attention = DemandAttention[Market]
   UNITS: Attention Units/min
DSHWS = 1
   UNITS: dmnl
DSMarket = 1
   UNITS: dmnl
HWS_AT = 5
   UNITS: min
HWSAttentionGap = MAX(0, DemandedHWS_Attention-Attention_to_HWS)
   UNITS: Attention Units/min
MarketAT = 5
   UNITS: min
MarketAttentionGap = MAX(0, DemandedMarket_Attention-Attention_to_Market)
   UNITS: Attention Units/min
PayingAttention_toMarket = Remaining_Attention*MAX(0, (MarketActivation))/MarketAT
   UNITS: Attention Units/min/min
PayingAttentionToHWS = Remaining_Attention*MAX(0, (HWS_Activiation))/HWS_AT
   UNITS: Attention Units/min/min
Perception_AT = 15
   UNITS: min
ProcessingAttention_AT = 10
   UNITS: min
ProcessingAttention_toMarket = Attention_to_Market/ProcessingAttention_AT
   UNITS: Attention Units/min/min
ProcessingAttentionToHWS = Attention_to_HWS/ProcessingAttention_AT
   UNITS: Attention Units/min/min
Remaining_Attention = InitialTotalAttention-Attention_to_HWS-Attention_to_Market
   UNITS: Attention Units/min
Shifting_Attention_from_HWS_to_Market = MIN(Attention_to_HWS,
MarketAttentionGap)/AttentionShift_AT
   UNITS: Attention Units/min/min
Shifting_Attention_from_Market_to_HWS = MIN(Attention_to_Market,
HWSAttentionGap)/AttentionShift_AT
   UNITS: Attention Units/min/min

****
Bias_Sector:
****

BiasThreshold = 0
   UNITS: dmnl
ContextualBiasDifferenceRatio = (Working_Memory[HWS]-
Working_Memory[Market])/(Working_Memory[Market]+Working_Memory[HWS])
   UNITS: dmnl
ContextualBiasToHWS =
(Working_Memory[HWS])/(Working_Memory[Market]+Working_Memory[HWS])
   UNITS: dmnl
ReactivitytoContexts = 1
   UNITS: dmnl
SelectionBias_ToHWS(t) = SelectionBias_ToHWS(t - dt) + (Updating) * dt
   INIT SelectionBias_ToHWS = InitialBiasToHWS
   UNITS: dmnl
SelectionBiasToMarket = 1-SelectionBias_ToHWS
   UNITS: dmnl
TimeNeeded_toUpdate = 5
   UNITS: min
Updating = UpdatingSwitch* ReactivitytoContexts*(ContextualBiasToHWS-
SelectionBias_ToHWS)/TimeNeeded_toUpdate
   UNITS: per minute
UpdatingSwitch = IF ABS(ContextualBiasDifferenceRatio)>BiasThreshold THEN 1 ELSE 0
   UNITS: dmnl
WM_PerceptionTime = 5
   UNITS: min
WMBuildingUp[HWS] = Attention_to_HWS/WM_PerceptionTime
   UNITS: Attention Units/min/min
WMBuildingUp[Market] = Attention_to_Market/WM_PerceptionTime
   UNITS: Attention Units/min/min
WMDecay[LogicsCategory] = Working_Memory/WMDecayTime
   UNITS: Attention Units/min/min
WMDecayTime = 10
   UNITS: min
Working_Memory[HWS](t) = Working_Memory[HWS](t - dt) + (WMBuildingUp[HWS] -
WMDecay[HWS]) * dt
   INIT Working_Memory[HWS] = InitialHWSGoal
   UNITS: Attention Units/min
Working_Memory[Market](t) = Working_Memory[Market](t - dt) + (WMBuildingUp[Market]
- WMDecay[Market]) * dt
   INIT Working_Memory[Market] = InitialMarketGoal
   UNITS: Attention Units/min

****
Dominance_Calculation:
****
AttentionDifference = Attention_to_HWS-Attention_to_Market
   UNITS: Attention Units/ min
ChangesOfHWSDominance = AttentionDifference
   UNITS: Attention Units/ min
ChangesofOscillation = IF ABS(AttentionDifference)>0.5 THEN 1 ELSE 0
   UNITS: per minute

```
HWS_Dominance(t) = HWS_Dominance(t - dt) + (ChangesOfHWSDominance) * dt
   INIT HWS_Dominance = 0
   UNITS: Attention Units
LevelofOscillation(t) = LevelofOscillation(t - dt) + (ChangesofOscillation) * dt
   INIT LevelofOscillation = 0
   UNITS: dmnl

**********
Initialisation_Calculation:
**********
InitialBiasToHWS = InitialHWSGoal/(InitialMarketGoal+InitialHWSGoal)
   UNITS: dmnl
InitialHWSGoal = 0.5
   UNITS: Attention Units/min
InitialMarketGoal = 1-InitialHWSGoal
   UNITS: Attention Units/min
InitialTotalAttention =
InitialHWSGoal*HWS_AT/(ProcessingAttention_AT*InitialBiasToHWS)+InitialHWSGoal+In
itialMarketGoal
   UNITS: Attention Units/min
```

A4.3 Sensitivity analysis set up

	DSHWS	DSMarket	Threshold	Accumulation of HWS dominance
Run 1	4.95	2.25	0	3.64749472286
Run 2	2.85	2.95	1	-0.133291788432
Run 3	0.55	1.25	0.75	-2.36266261348
Run 4	4.55	4.75	0.5	-0.0937003421257
Run 5	3.75	0.75	0.75	15.6382223802
Run 6	4.15	3.95	0.25	0.179525349164
Run 7	1.55	4.35	0.75	-6.76355934615
Run 8	1.15	1.75	0.25	-4.93698306664
Run 9	1.25	3.65	1	-9.65312494729
Run 10	4.65	2.45	0.75	2.01949338334
Run 11	2.95	2.05	1	1.88135657813
Run 12	0.45	4.65	0.5	-19.9348054929
Run 13	2.65	0.95	0.25	13.0697227048
Run 14	3.65	0.25	0	24.0352291803
Run 15	3.55	3.75	0.5	-0.153856701159
Run 16	3.95	4.05	0	-0.0925583153878
Run 17	4.85	3.45	1	0.845731072793
Run 18	0.85	1.85	0	-8.29463899496
Run 19	1.05	2.55	0.25	-11.5910715245
Run 20	1.35	4.25	0.5	-8.88034643434
Run 21	2.25	0.55	0.25	14.0529461011
Run 22	1.85	0.05	0.75	8.63192952115
Run 23	1.95	1.65	0.5	2.3257116425
Run 24	1.75	4.55	1	-4.7931571362
Run 25	3.05	2.85	1	0.255008026875
Run 26	4.75	1.35	1	9.09836584403
Run 27	2.05	2.65	0.5	-1.50243028685
Run 28	0.65	1.15	0	-1.4840516656
Run 29	2.45	0.85	0.25	12.7847801039
Run 30	0.25	3.15	0.5	-17.7736525225
Run 31	2.75	2.35	0.5	1.07269210388
Run 32	2.15	4.95	0	-3.98142514169
Run 33	3.25	0.15	0.25	22.5845839696
Run 34	1.45	3.05	0	-8.57775031244
Run 35	3.45	3.55	0.5	-0.0848874503172
Run 36	0.75	4.15	0	-19.5005337113
Run 37	3.15	1.05	0.5	13.9928784574
Run 38	0.15	4.85	1	-21.0642217052
Run 39	3.85	1.95	0.75	2.92874939233
Run 40	0.95	0.65	0.25	0
Run 41	0.05	2.75	0.75	-15.687305608
Run 42	4.35	3.35	1	0.698909078548
Run 43	4.45	0.35	0.75	20.7345970249
Run 44	0.35	1.55	1	-5.61379903995

Run 45	2.35	4.45	0	-3.04076124844
Run 46	3.35	3.25	0.25	0.138498337288
Run 47	1.65	2.15	0.75	-3.30719951308
Run 48	4.25	0.45	0.75	19.6512823355
Run 49	2.55	3.85	0	-2.02750452932
Run 50	4.05	1.45	0.25	9.46898887058

Appendix 5 Supplementary material for chapter 8

A 5.1 Variables and example quotations

Variable in the model	Definitions	Example quotations	Participant
Active resistance of inconsistency	Decisions that represent the organisation's own aspirations or commitment to long-term directions regadless of external environment changes.	*"So the real challenge is what do we as an organization want to achieve around carbon? And that's how that's what I'm planning for."*	HA-A1
		"I'd say the right hand side (private funding) is becoming more important than the left hand side (government funding)... When you're when you're working on projects that have twenty, thirty, or fourty year payoff, we're increasingly reliant on the money we can raise ourselves as organisations which then feeds into the strategic direction we adopt"	HA-A1
		" you know the various different pieces are almost our willingness to try and be obliging because we're seeing that as a source of funding. "	HA-A2
		"we're going to do the stuff which we think is going to be good for us and our residents."	HA-A2
		"go out for the bond issue actually is a really strong indication of our confidence that yeah, we're going to do that in the long term, you know. Regardless, regardless of the requirement for government with the code for sustainable Homes or EPC levels or whatever it is, we've set our x (long-term plan)."	HA-A2
		"Like us are sort of housing associations.. to get larger and sort of better evolved is having the strategic certainty and clarity to know what we want to do and to be able to resist some of those pressures. Like obviously you can't resist all of them 'cause we are regulated "	HA-A4
		"we know that we have an ambitious program... and I suppose if that agenda comes up and then funding comes up that might bring forward that program we would be doing it regardless. But we might be doing it a different scale or a different time."	HA-B1

		"...what we're trying to do is have long term plans which we think are right , given evidence, given all that we know. And then if opportunities come about, then yes, of course we'll go for them. ... Policy always to drive what we do outside. Of course it does through the planning system, etc. There's obviously some you know, really functional pieces there, but I think you couldend up just chasing your tail"	HA-B2
		"we won't need to do some modifications or adjustments or whatever, because that's just what happens when you work with other people. But I think I think it's us being very clear about what we want to do, what we think is the right thing to do for x (regeneration project) and then setting it out very clearly."	HA-B3
Anticipation of inconsistency or changes	Decision-makers' perceptions and predictions of future inconsistency or changes.	*" It could be disruptive rather than negative or something similar. You know it not necessarily negative. OK, but you may have to change your plans unexpectedly"*	HA-A1
		" How do we keep it (long-term planning for projects) loose enough to anticipate kind of changes in technology as it evolves and move on, but also anticipate how it might be steered by government policy as it's kind of emerging? 'cause whilst the goals of the long term goals are clear like the how, how we get there on the subsidies that might become available or the kind of state was different. Energy technologies or sustainability targets, for example, obviously shift.	HA-B3
Clarity of long-term corporate strategy	Transparent and clear long-term business directions	*"Like us are sort of housing associations like X (HA-A) and Y (HA-B) to get larger and sort of better evolved is having the strategic certainty and clarity to know what we want to do and to be able to resist some of those pressures."*	HA-A4
		"It is a long term strategic direction which then gives us that level of freedom in terms of other bits of decision making."	HA-B1
		"X (HA-B), an only recently has are kind of chair ..has put certain stability on the organizational's agenda. I think. Like recently said there's like three things we need to focus on sustainability. And now I think that is going to give us much more freedom to try things out in terms of sustainability with in terms meet,"	HA-B1

		"I think the strategic direction gives us a very strong basis to work up detail and approaches on the back of so it doesn't, as you would expect."	HA-B2
		"organisations who do who give attention to sustainability and health and things like this actually a really clear about what those, those the value and the outcomes of why they're doing it. And they can really articulate it really clearly."	HA-A2
Decisions to get things done	Firefighting decisions to resolve day-to-day or immediate issues	*"my day jobs dominated by short term stuff, So I have every day I do like a list of all my jobs and I tip it to my desk and then I struck them through. Actually when we did that exercise all I was thinking about was long term stuff. "*	HA-A1
		"decisions to get things done is this sort of sense of quite often firefighting about things. I mean, it's this sort of like difference between actually trying to make some real slight fundamental structural changes to what's happening against, say, you know, complaints. "	HA-A2
Decisions with long-term vision	Decisions focusing on implications over the next few decades' horizon.	*"I think if you do that, the more decisions with the long term vision you have, the easier it is. The greater active resistance."*	HA-A2
		"You know we don't have to make the structural changes or the structural investment or the structure that would actually really payout over the long term because we feel now we've got to sort this down."	HA-A2
		"so therefore it is that agreement of long term goals is what influences that place making."	HA-B1
		"I think the reality is that it's a whole series of things which make a place and that will change overtime as well."	HA-B2
External environment changes	An aggregation of external events such as industry trends,	*"constantly anticipate change, so that's obviously corvids the immediate change. But we can start to see emerging pattern different patterns of working lives of how people use their homes in response to community demographic change."*	HA-A1

	technology changes, demographic changes locally, climate change, public crisis events (COVID-19).	*"...COVID we now actually taking seriously, what we've been doing around loneliness and fragmentation health. I think there was a big push around more active placemaking. So there's something about the latest. The latest crisis externally. Yeah, and that's not organizational. That's kind of in the industry, like in there that's in the industry or wider, all latest industry crisis. "*	HA-A2
		"...external government responsiveness and what they're responding to... You know, they have their own versions of predictable but hard to plan for external extent events"	HA-A2
Exploration of new funding schemes	Exploration of subsidy and funding opportunities include bond, equity, and investment market in the industry.	*"because we were not to market specifically around ..commitments around sustainability and we had no difficulty whatsoever in raising money against that and think we're borrowing at one 1.25%.It's practically free money, and that is the market realizing you know that they have something to offer in terms of the delivery of sustainable home sustainable communities."*	HA-A1
		"Government is saying we can't afford to sit like funds health. Industry is going to have to do it."	HA-A2
		"Because ESG funding does at least focus in terms of these types of investment from the long term, from we will change our business to be more environmentally sustainable…"	HA-A3
		"The entire bond market, the entire equity market, the entire investment market, and what we're getting into from non from basically debt financing is all of the different streams that that can come through."	HA-A4
Freedom to innovate and try out	Flexibility in innovating and trying out new ideas in regeneration projects	*"And if it's not specifically set within the strategic direction. So like for individuals or groups or stakeholders to come up with kind of innovative ideas."*	HA-B1
		"I guess with energy and sustainability it's a little bit different because like the government are trying to set more ambitious targets, even if we don't know how we're going to get there. But like some yeah, some of the other aspects, it is quite difficult sometimes to feel like you have that freedom to try or propose different things. "	HA-B2
	HAs' commitment to	*"It's the sort of appetite within X (HA-A) for long term financial exposure or commitment."*	HA-A1

	take financial and reputational risks in long-term decisions	*"... we're in organization have committed to what we call X (HA-A's long-term plan), which is all about sort of quality of life of our residents...so we're going to lose another £20,000,000 on this Y (a new development), but we as an organization have committed to doing this."*	HA-A1
		"It flows entirely from X (HA-B) its sense of itself and its role in society. No one else would have gone near that."	HA-A1
HAs' willingness to risk exposure		*" I think it's the type of organization... Like a private developer (who) has the ability to task can be a bit riskier on certain things, but with X (HA-B) there's kind of a reputational issue. But also like that like it goes back to the kind of organizational values. Again. So like principally we are a social landlord, and that's what we do, so we have to protect existing and vulnerable residents. "*	HA-B1
		"A lot of those are about how are we going to, you know, manage the risk how we're going to manage this like financing so for that."	HA-A2
		"actually the appetite to do that in the 1st place. .. It is like you have to be a specific type of organization with a specific set of beliefs and focus to do that, you know, regardless of all the other stuff that comes up."	HA-A4
Inconsistency in government policy	Frequent changes in housing and planning policy directions at national or local government level, or disjoint policy objectives across departments, or between	*"you end up reinforcing it when you don't mean to, you know, because you know we're talking about health and sustainable communities here and well being and longevity... government still disjointed in its thinking in the planning"*	HA-A1
		"we have things like Code for Sustainable Homes, which was big sort of flagship policy about delivering carbon zero homes. That got bins very quickly and unceremoniously because of lobbying from the industry. Now we're hearing 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 almost, you know, like they completely changed, literally changed direction 180 degrees every couple of years depending."	HA-A1
		"Government is not doesn't have a single cohesive approach to our industry... They want directly contradictory or incompatible things from the organization or from the sector ...There's like a clashing of internal tensions of government and how that manifests itself in policy. "	HA-A4

	national and local level.	*"like GLA and local authorities have different time frames that I think that measuring us devising success, that can be a challenge, and I think different parking for example like on our projects. X (council name) want as much parking possible, in the GLA as little parking as possible. How do you reconcile these different positions as well?"*	HA-B3
Inconsistency in financial decisions	Frequent changes or disjoint 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.	*"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 are sort of get your attention."*	HA-A1
		"it wasn't just housing but a number of budgets and activities that would contribute to government targets, data targets around health and well being, and house building an affordable homes. All the rest of it went out the window because he (a politician) had made a political commitment around saving money against the welfare budget. And that literally just came overnight and we losses owe huge amounts of money out of all our budgets as a result of that."	HA-A1
		"the Public Accounts Committee report which actually went through very sort of like clearly about saying here are government housing spending decisions which have been made.. (the report says) there's no sort of like sense of strategy and you know, and then the money just get thrown there, then it gets thrown somewhere else."	HA-A2
		"government have released a significant amount of funding around enabling people to improve their homes in terms of insulation etc and have made some big noises about it. But the reality is that everything I've heard says they've actually, it's a really difficult thing to actually use and do anything with, so it's causing immense frustration so you know in basic terms, I feel there's a big difference between rhetoric if you like and reality. "	HA-B2
Internal reproductions of inconsistency	Internal decision tensions manifested as frequent	*"you could invest quite a lot of time into like a new technology or into new a new model of delivery that then suddenly becomes unviable."*	HA-B3
		"We want to be on the right side of government, but actually by taking on a lot of their the sort of nudges that they give to us, we end up representing their own inconsistencies."	HA-A4

	changes in long-term directions, priorities, agenda, rules, structures, values and models of delivery.	*"It could be disruptive rather than negative or something similar. You know it not necessarily negative, but you may have to change your plans unexpectedly "*	HA-A1
		"I think there's a push or a tension between the values of the organizational culture and the governance structures and the rules we set ourselves and the roots we set up ..."	HA-A2
Short-term decisions aligned with long-term vision	A category of short-term decisions that are relevant to the daily delivery of long-term strategies.	*"often particularly in regeneration when it gets down to the level of detail of a red line ... (for example) deliver like 300 homes. We will then hand that over to our delivery colleagues with a full brief and they will they will deliver it to the brief ... It's a question of density, site context, and an finance. An when it kind of 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."*	HA-B3
		"I guess that it is not a bad thing to make short-term decisions like somethings have to by nature of the short term like look all the stuff we've done this year with COVID-19 stuff right now. So there is like short term decisions on that....It's more about alignment with the long term vision. Like if you're getting that right like that, because I think that's what you're saying"	HA-A4
		"Increasingly, we're finding that a source of cheap funding because X(HA-A) is especially an environmentally responsible organization, through the ESG funders so that that would drive kind of relatively short term (decisions)"	
		"the long term vision you would be able to see the cumulative affect of yeah positive short term decisions'cause they'll have to happen, but you know they will. They'll be going the right direction rather than you know, drifting off into the ether."	HA-A2

Weighting of sustainability and health in business	Decision-makers' recognition of the importance of long-term goals, or tangible measurements on the intangible goals	*" I think it's the type of organization... Like a private developer (who) has the ability to task can be a bit riskier on certain things, but with X (HA-B) there's kind of a reputational issue. But also like that like it goes back to the kind of organizational values. Again. So like principally we are a social landlord, and that's what we do, so we have to protect existing and vulnerable residents. "*	HA-B1
		"I think ESG is making a connection between sustainability and health and money."	HA-A1
		"I think we talked about it in the past in terms of how do we quantify these intangible 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 so important. "	HA-A2
		"it's not say which mechanism we use it, it's how we recognize that as important within the business"	HA-A4
		"The only reason I'm in front of that group making that pitch is because they case that I've made is aligned with the values of the organization, otherwise they wouldn't even look at it. "	HA-A1