Navigating Complexity in Sustainable Urban Area Development

A research on enabling sustainability ambitions in urban area development through a multi-actor transition perspective

Master Thesis | Lotte Zwolsman

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Preface

This thesis completes the final component of my Master's degree in Construction Management and Engineering at Delft University of Technology, Faculty of Civil Engineering and Geosciences. It is the result of years of learning, effort and dedication.

While pursuing my Bachelor's degree at the Faculty of Architecture and the Built Environment, I developed a passion for sustainability and a growing interest in urban area development. I was surprised that, although there seem to be many sustainable initiatives around the world, sustainable goals often fail to be realized, even in a wealthy country like the Netherlands. If it can be done anywhere, it should be possible here. That curiosity became the starting point for this research.

Writing this thesis has been a journey full of ups and downs. Besides learning about the topic itself, I have also developed valuable skills in doing research and academic writing. But perhaps even more meaningful has been the personal learning process. My internal drive to find solutions often conflicted with the nature of researching a wicked problem, a problem that, by definition, has no clear solution. I often found myself unconsciously trying to solve the issue, which led to uncertainty about the value of my contributions. Over time, however, with the valuable support of others, I gradually gained confidence and clarity in the direction of my research.

I would therefore like to express my gratitude to my TU Delft supervisors, Leonie Koops and Vitalija Danivska. Without their guidance and support, I would not have reached this point. Their confidence in me and my work has been incredibly valuable, especially during moments when I doubted my own research direction. I would also like to thank my chair, Daan Schraven, for always being available from the start and for providing valuable feedback at the official milestones. This support was deeply appreciated.

Additionally, I would like to thank my supervisors at AT Osborne, Alexander Schütte and Sacha Verhulst, who always made time to answer my questions and support my research. They also made sure I experienced the social side of the company, which at times was a welcome distraction from the pressures of graduation.

Lastly, I would like to thank all the participants who contributed to this research. Through open and honest conversations, they shared both professional insights and personal experiences that were essential to this thesis. Each interview was a highlight in itself. I consider it a privilege to have spoken with such a diverse range of people and to have gained insight into their daily work.

I hope you enjoy reading my thesis and that it provides you with insight into the fascinating and complex world of sustainable urban area development.

Lotte Zwolsman
Delft, July 2025

Executive Summary

Climate change is one of the biggest issues the world faces today. Cities are both major contributors to climate change and particularly vulnerable to its consequences. In response, governments on different levels formulate ambitions aimed at creating economic, social and environmental sustainable urban areas. Urban area development is a domain of practice used to translate these ambitions into concrete interventions. However, while sustainability ambitions are increasingly set, their realization in practice often falls short, resulting in a gap between ambitions and their actual realization.

A defining characteristic of urban area development is its complexity. This complexity implies that sustainability ambitions can be constrained by the dynamics of the system itself. Therefore, realizing sustainability ambitions requires a fundamental change of the underlying structures of this system. To understand and navigate such complex processes of change, transition theories have been developed. This study takes the perspective of transition theories to examine how sustainability ambitions can be enabled and addresses the following research question:

How can transition theories contribute to enabling sustainability ambitions in the complex environment of urban area development?

The research consists of two parts. The first part is the theoretical research and is based on a literature review. The second part consists of empirical research with data collection through semi-structured interviews.

Theory

The literature review shows that urban area development is highly complex, as it involves multiple scales, sectors, phases, disciplines, spatial dimensions and actors. In this complex environment, the realization of sustainability ambitions is hindered by a wide range of challenges. These challenges are categorized into financial, policy and regulatory, and organizational challenges.

Achieving sustainability ambitions in urban area development is considered a wicked problem. To better understand the complexity of this problem, transition theories are examined. Literature shows that these theories can be applied to urban area development and highlights that urban area development is undergoing a fundamental transition. At the same time, related domains, such as energy and mobility, are experiencing their own transitions, which interact with and influence the broader transition of urban area development.

As part of the theoretical foundation, the sustainable market transformation theory is introduced. This theory emphasizes that transitions towards sustainable outcomes can be enabled through actions of five actor groups: governments, industry, NGOs, financial institutions and knowledge institutes. These actors are expected to progress through four distinct transition phases: inception, competitive advantage, synergy and institutionalization, with each group holding specific responsibilities within each phase. Applying this framework to the context of urban area development reveals a broad set of actors that are needed to enable sustainability ambitions. It also shows that actors often go beyond their primary roles and take on responsibilities that belong to other groups, adding further complexity to the system.

The insights from theory combines the actor (sub)groups and categories of challenges into a conceptual structure, offering a foundation for the empirical research. In addition, the phase component of the sustainable market transformation is used as a framework to further guide the empirical analysis.

Empirical

The second part of the research consists of 24 semi-structured interviews with representatives from the five actor groups. The conceptual structure developed in the literature review serves as a foundation for structuring the results. The interviews offer a broad and deep understanding of the financial,

policy and regulatory, and organizational challenges actors face in practice. In addition, by using the phase component of the analytical framework, the systemic dependencies underlying the challenges are explored.

Findings

The empirical research shows that all five actor groups see a role for themselves in enabling sustainability ambitions, which highlights that these actors are indeed relevant in the context of urban area development. However, all actors face various financial, policy and regulatory, and organizational challenges in doing so.

Actor Group	**Governments**	**Industry**			**NGOs**	**Financial Institution**				**Knowledge Institutes**
Sub Group	***Municipalities***	***Developers***	***Housing Associations***	***Engineering and Consultancy***	***Environmental Organizations***	***Banks***	***Insurers***	***Institutional investors***	***Property investors***	***Academic Institutions / Research Institutes***
Financial	Lack of financial resources: dependent on national government	High costs	High costs	High costs	Low budget reserved for urban area developments	Financial logic does not incorporate non-financial value	Long-term financial risks of damage	Financial risks	High upfront costs	
	High additional costs	Business model limitations: Reliance on short-term sale-based income	Tension between societal value and financial viability	Lack of financial resources			Shift in risk perception		Short payout cycle limits long-term investment	
	Financial uncertainty		Business model limitations	Risk perception among other actors					Split-incentives between investor and tenant	
	Split-incentives			Split-incentives						
Policy and regulatory	Lack of binding legal instruments	Stacking of requirements	Maximum rent levels	Conflicting requirements		Risk of client loss due to more regulations	Lack of legal instruments			Lack of clear policy vision
	Conflicting policy goals	Conflicting requirements	Stacking of policies and ambitions	Lack of clarity in policies and vision			Fragmented rules			
	Vague goals									
Organizational	Limited coordination between departments			Limited agency	Fragmentation of responsibilities within local government	Lack of measurable financial benchmarks	Lack of long-term data for changing risk perception	Lack of knowledge on evaluating impact	Risk of client loss	Misaligned academic reward system
	Lack of operational knowledge			Lack of operational knowledge among other actors	Lack of capacity		Lack of involvement in development processes	Lack of measurable financial benchmarks	Lack of (early) involvement in development processes	Lack of (early) involvement in development processes
	Lack of expertise			Lack of capacity among other actors	Solely used as a form of legitimacy			Lack of suitable investment products		Limited agency
	Short-term political cycles			Lack of coordination within governments	Limited agency					Short-term research focus
	Limited use of lessons learned			Limited learning across projects	Lack of early involvement					Limited measurability while focused on fixed definitions
					Difficult collaboration with commercial actors					

Figure 1: Actor specific challenges

The phase component of the sustainable market transformation theory proposes that transitions unfold through four phases, each assigning specific responsibilities to different actors. Analyzing the findings with this framework further unpacks the challenges and roles into five illustrative examples:

1. Banks want to integrate sustainability criteria (*institutionalization*) beyond energy when issuing loans to clients, but lack the benchmarks (*competitive advantage*) that knowledge institutes are expected to develop.
2. Municipalities set ambitious sustainability goals (*synergy*) and want to embed them in regulations (*institutionalization*), but depend on developers whose business models (*competitive advantage*) have limitations in including the associated costs.
3. Institutional investors are looking for long term investment products (*synergy*) that industry actors are still piloting (*inception*).
4. Financial actors are reluctant to invest on a large scale (*synergy*) when governments do not provide clear and consistent long-term visions (*competitive advantage*).
5. NGOs are expected to engage in projects (*inception*), but experience limited influence when industry actors dominate decision-making and use them as a form of legitimacy (*inception*).

The examples show that the challenges are not isolated but embedded in the complex system of dependent actor responsibilities across phases in the transition towards sustainable outcomes. Progress by one actor depends on others moving forward as well. The resulting misalignment shows that the complexity of urban area development arises not only from the variety of actors and challenges, but also from their interconnected individual progress within a shared system of change.

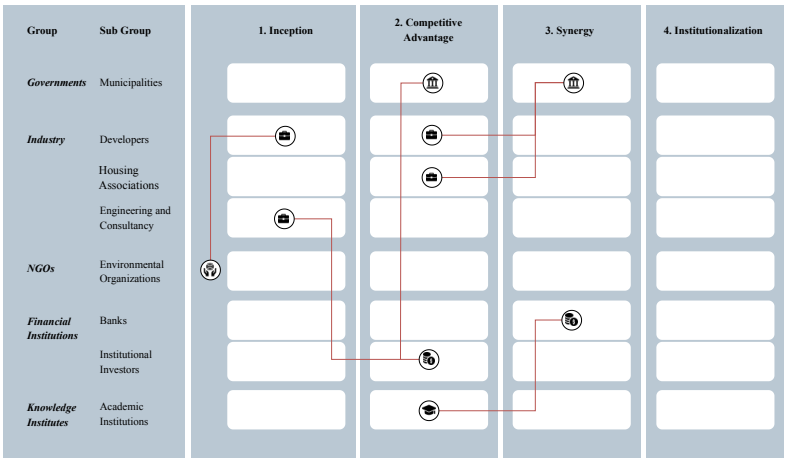

Figure 2: Actors in transition phases

Conclusion

Transition theories contribute to the understanding of the complex environment of the urban area development system in which sustainability ambitions must be realized.

First, it shows that urban area development, as a domain of practice, is undergoing a fundamental transition in response to increasing sustainability demands. Second, by using the sustainable transformation theory as a guiding framework and applying this to urban area development, this study describes the large amount of actors involved in enabling sustainability ambitions in the complex environment of urban area development. Third, by using this framework, actor specific challenges are identified that show the large amount of financial, policy and regulatory, and organizational challenges in the system of urban area development. Fourth, transition theories contribute by providing a phasing perspective. Further complicating individual challenges, dependencies are shown between actors that are operating in different phases of transition. Multiple examples show that actors are currently misaligned, limiting the collective progress necessary for enabling sustainability ambitions.

Summarizing, transition theories contribute to the understanding of the complex environment of the urban area development system in which sustainability ambitions must be realized. By using the sustainable market transformation theory as a guiding framework, this study reveals the large amount of actors and challenges, and further explains these challenges by showing how they are linked to the phased positions of actors within the transition of urban area development. In doing so, the study underscores the relevance of involving all actor groups, as each holds the potential to either enable or hinder collective progress toward sustainable outcomes.

Discussion and Recommendations

This study builds upon, rather than contradicts, current transition literature. It aligns with the foundational concepts of multi-level and multi-phase transition theories, but contributes by offering a distinct perspective on the transition of the urban area development regime. Specifically, it shifts the focus toward the role and positioning of actors within this transition. Existing literature acknowledges the importance of actor collaboration. However, the complexity of actor dependencies and misalignment across transition phases has received limited attention in the context of urban area development.

A practical implication of this research is the importance of actor involvement during the initiation phase, the phase in which sustainability ambitions are formulated. The results indicate that not all actor groups are currently engaged in this phase, or that some experience limited agency when they are involved. It is therefore advisable to bring together representatives from governments, industry, NGOs, financial institutions, and knowledge institutes during this phase. This early dialogue may help for the identification of each actors challenges and potential contributions, and clarify how each actor perceives their role. By making dependencies visible and open to discussion, actors can explore responsibilities and

negotiate what is feasible, both individually and collectively. Such understanding may enable setting shared goals, rather than fragmented agendas pursued without coordination. This highlights the fact that everyone can contribute, even if it means that one actor steps back while another moves forward.

This study reveals a piece of understanding in a highly complex system. During the research, multiple topics for further investigation have emerged. It is therefore recommended to:

- Examine progress in distinct transition domains that are happening inside the urban area development transition.
- Focus on underrepresented actor groups, such as higher levels of government.
- Include end-users as an actor in the study. This group could potentially act as drivers of transitions themselves.
- Conduct a case study research to examine how the five actor groups are involved, which roles they take on, and how the system functions in a project.
- Investigate conflicting ambitions and goals. This is a frequently mentioned challenge, but not explored in depth within this study.
- Explore international contexts to find out whether similar actor groups, challenges and transition dynamics are present in other countries.

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Introduction

Climate change is one of the biggest issues the world faces today. The effects are becoming more visible in various forms, such as rising sea levels, droughts, floods and the loss of biodiversity. These climate issues not only affect vulnerable natural areas, but also have effects on societies, economies and the livability of urban areas. According to the European Commission, cities are particularly vulnerable to the impacts of climate change, due to the concentration of people and infrastructure, spatial constraints and population growth (European Commission, 2025). However, cities are not only the places where the effects of climate change are most visible, they are also an important part of the problem. At the same time, cities offer opportunities to address climate challenges as they serve as hubs of innovation, policy and collaboration. Therefore, substantial impact can be made through interventions in urban areas (Ernst et al., 2015).

In the Netherlands, a specific field emerged in the 1990s to design, coordinate and implement such interventions, and has since developed into a distinct domain of practice: Urban Area Development (Daamen, n.d.). This domain of practice is used by provinces and municipalities as a strategic instrument to guide spatial transformations and achieve broader spatial and societal goals. While the growing urgency of climate change is leading to many goals related to sustainability, they are not always realized in practice and are often deprioritized during the process (de Jonge, 2023).

This research examines why sustainability goals are often difficult to realize and how transition theories can contribute to a better understanding. The following section outlines the central problem and the related concepts, leading to a problem statement. Thereafter, the research objectives and questions are introduced, followed by an explanation of the research design and scope. Finally, the reading guide of this thesis is presented.

1.1. Problem Definition

This research addresses the challenge of achieving sustainability ambitions within the context of urban area development. Although sustainability goals are increasingly integrated into planning policies and development visions, the actual realization of these ambitions in practice remains limited. The following paragraphs explore the foundations leading to this problem.

1.1.1. Urban Area Development

Urban area development involves the integral and long-term development of an area through the integration of buildings, public space and infrastructure. It covers multiple dimensions and requires the involvement of different public and private actors. The process is never solely a governmental responsibility and involves the interaction between private, public and civil society organizations (Verdaas, 2019). The defining characteristic of urban area development is its complexity, as both its content and context are shaped by the dynamic interaction of multiple overlapping elements (Peek & Troxler, 2014).

Urban area development is used as an instrument to guide spatial transformations of areas (de Jonge, 2023). This process is divided into four phases: Initiation phase, Feasibility phase, Realization phase, and Management- and Maintenance phase (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019).

1. Initiation Phase

In the initiation phase, the initiative is born to develop a certain area for development. This first initiative can originate in both private and public sectors. This phase is intended to investigate whether the development is desirable, which parties want and can be involved, and whether the initiative has a chance of success. In this phase, the ambition of the development must be established (Franzen et al., 2011).

2. Feasibility Phase

The Feasibility phase concerns the phase from ambition up until construction work. Within this phase, definition, design and preparation are distinguished (Puylaert et al., 2011). There is simultaneous calculation and drawing and the business case is worked out. If the first idea is not feasible, the parties will sit down together again to revise the plan, principles and ambitions. The collaboration between public and private actors within public-private partnerships is typically established in this phase. The feasibility phase ends with the selection of development partners, often through a tendering process in which private parties can participate via an open market selection or a formal procurement procedure (Franzen et al., 2011; Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019).

3. Realization Phase

The realization phase centers on the implementation of interventions in an area, including the establishment and construction of real estate as defined during the feasibility phase. In this phase significant upfront investments are made. The financial feasibility of the project is largely determined at this stage, as costs become concrete while revenues may still be partially uncertain (Franzen et al., 2011).

4. Management- and Maintenance Phase

In this last phase, the area development is completed. It now comes down to the use, management and maintenance, until the moment that major developments for the area make new planning necessary (Franzen et al., 2011; Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019).

Throughout the development process, sustainability ambitions are introduced by public actors during the initial phases. In the feasibility phase, these ambitions are translated into concrete plans through design and financial calculations. Their actual implementation is expected to take place during the realization phase. This phased process illustrates how sustainability ambitions are shaped by the structure and dynamics of urban area development.

1.1.2. Realizing Sustainability Ambitions

Sustainability is a broad concept that holds many definitions. It is often divided into three dimensions on which multiple theories are built: environmental (planet), social (people) and economic (profit), as illustrated in Figure 1.1.

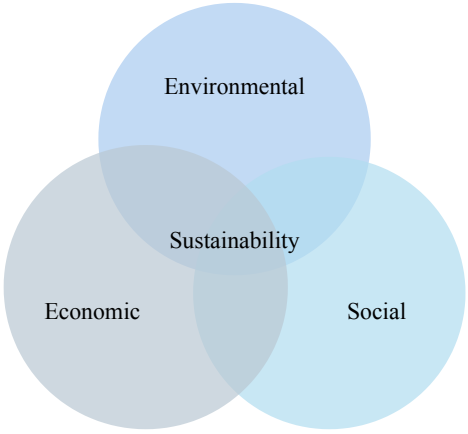

Figure 1.1: The three dimensions of sustainability (Theisz, 2025)

At the beginning of a development process, a wide range of sustainability ambitions are formulated. These ambitions often stem from higher-level strategies, such as the European Unions Regional Policy (European Commission, 2025), and are further specified in national frameworks. For instance, the Dutch government has translated European climate objectives into national goals, including energy guidelines and the ambition to achieve a fully climate-neutral and circular built environment by 2050 (Rijksoverheid, 2022).

These national frameworks are translated into policy objectives by municipalities and specified per individual development project. The resulting ambitions address multiple themes such as energy, water, urban green space, nature, mobility, health, economic vitality, safety and social cohesion (Puylaert et al., 2011). While these ambitions vary in focus, they can generally be linked to the three core dimensions of sustainability. As Puylaert et al. (2011) note, the key to achieving sustainable urban area development is performing well on all three dimensions: environmental, social and economic, and thus in realizing a wide range of ambitions.

In reality, ambitious plans often turn out to be symbolic gestures, as there is an unbridgeable gap between vision and reality. In some cases, projects or ambitions are realized, but this is often achieved by prioritizing one dimension of sustainability, at the expense of others (Puylaert et al., 2011).

This gap between ambition and realization is widely acknowledged in academic literature. For example, Filion et al. (2015) identify a gap between the sustainable urban visions presented in urban planning and the actual development. Other research shows that actors involved in development projects often have divergent values and interests, which leads to ongoing negotiations and compromises throughout the process. As a result, sustainability ambitions are often diluted, delayed or abandoned entirely (Ravesloot, 2005). Especially when challenges arise, implementation of ambitions often fall short and are frequently abandoned (van der Linden, 2018). Similarly Vergerio and Knotten (2024) underlines the recurring gap between ambitious goals and tangible outcomes in sustainable urban development.

1.1.3. Navigating Complexity

As highlighted earlier, the defining characteristic of urban area development is its complexity (Peek & Troxler, 2014). Urban area development covers multiple sustainability dimensions, spatial scales and requires the involvement of different public and private actors. This complexity implies that sustainability ambitions are not only shaped, but also constrained by the dynamics of the system itself. As such, bridging the gap between setting and realizing sustainability ambitions is not just a matter of creating policy goals, but part of a complex process of system change.

To understand and navigate such complex processes of change, transition theories have been developed since the beginning of the 21st century (Biely, 2023). Transitions are processes of structural change in societal systems and come about when dominant cultures, structures and practices in society are put under pressure by innovations or external changes (Peek & Troxler, 2014). Transition

theories provide frameworks to understand past transitions and to hypothesize about how future transitions could unfold (Biely, 2023).

Applying transition thinking to the context of urban area development can provide valuable insights into why sustainability ambitions are often not realized in practice. In addition, it can contribute to identifying what actors should be involved in realizing these ambitions and what responsibilities they have in doing so. A deeper understanding of the problem forms a necessary foundation for addressing it. Therefore, this study builds on transition theories to investigate the gap between ambition and realization in urban area development.

1.1.4. Problem Statement

Urban areas are both major contributors to climate change and particularly vulnerable to its consequences. In response, governments on different levels formulate sustainability ambitions aimed at creating economic, social and environmental sustainable environments. Urban area development is a key practice in translating these ambitions into spatial interventions (de Jonge, 2023).

While sustainability ambitions are increasingly integrated into policies and early phases of urban area developments, their realization in practice often falls short, resulting in a gap between the ambitions and actual outcomes (Filion et al., 2015; Puylaert et al., 2011; Ravesloot, 2005; van der Linden, 2018; Vergerio & Knotten, 2024).

To advance more sustainable urban area developments, it is essential to gain a deeper understanding of the underlying causes of this gap. This study addresses that gap by examining how sustainability ambitions can be enabled in urban area development through the lens of transition theories.

1.2. Research Objective

The objective of this research is to gain a deeper understanding of why sustainability ambitions in urban area development are often not achieved.

The main objective is divided into three specific objectives that guide this study:

i. To understand the characteristics of urban area development.
ii. To explore the challenges that hinder the realization of sustainability ambitions.
iii. To uncover the systemic complexity underlying challenges within urban area development.

1.3. Research Question

Based on the problem statement and research objectives, the following main research question has been formulated:

How can transition theories contribute to enabling sustainability ambitions in the complex environment of urban area development?

1.4. Sub-Questions

1. What does the complex environment of urban area development entail?
2. What are the challenges in realizing sustainability ambitions in urban area development?
3. What insights do transition theories offer into the context of urban area development?
4. How can the relevant actors and their responsibilities be defined by applying these insights to urban area development?
5. What challenges in realizing sustainability ambitions in urban area development do these actors experience?
6. How can the insights from transition theories contribute to further explain these challenges?

1.5. Research Design

To achieve the objective of this study and answer the main research question, a qualitative, descriptive and exploratory research design is used. This approach makes it possible to observe, describe and document key characteristics of sustainable urban area development as it naturally occurs in real-life setting (Shinija, 2024).

Descriptive research helps to identify challenges in current practices, which fits the objective of this study to understand why sustainability ambitions are often not achieved. The exploratory component allows for a deeper investigation into these challenges and the complexity behind them (Shinija, 2024).

As Lim (2024) explains, choosing qualitative research is choosing for engaging with the depth and complexity of social phenomena. It allows researchers to connect with the perspectives, experiences and meanings of those involved. Instead of focusing on solutions, this research aims to explore the *why* and *how* of the problem, rather than to quantify or provide fixed answers. To do so, a combination of theoretical and empirical research is used.

Theory can be used in research in many ways. It can be used to help shape, develop and guide research questions, help decide what data you want to capture, support the interpretation of findings and help explain phenomena of interest (Giles & Harrison, 2023). In this study theory is applied in multiple interconnected ways. First, it is used to help shape the research design. Second, theory is used to deepen the understanding of the proposed sub-questions (sub-questions 1 to 4). Third, theory supports the interpretation of the findings.

The empirical component of this study aims to uncover insights in areas where existing knowledge is limited by collecting and analyzing the perspectives and experiences of actors involved in urban area development (sub-questions 5 and 6). By connecting theoretical understanding with empirical evidence, this research aims to contribute both conceptual and practical to the field.

1.6. Research Scope

This research focuses on urban area development in the Netherlands, with a focus on sustainability ambitions set by municipalities. While national and international frameworks provide the broader policy context, the study concentrates on the development, transformation or expansion of parts of neighbourhoods or cities.

The scope has deliberately been kept broad to enable a systemic understanding of why sustainability ambitions are often not realized. It looks at challenges across different types of developments and among various actors involved. Sustainability is considered in its full scope, encompassing environmental, social and economic dimensions.

1.7. Reading Guide

This thesis is structured into six chapters. Chapter 1 introduces the research topic, problem statement and research questions. Chapter 2 outlines the literature review, presenting the theoretical foundation of the study. This chapter provides a conceptual structure and analytical framework that is further used in the study. Thereafter, Chapter 3 presents the methodology used in the empirical part of the research. Chapter 4 presents the results, structured according to the conceptual structure and further analyzed using the analytical framework established in the literature review. Chapter 5 offers a discussion of the findings, including implications, practical recommendations and limitations, and ends with recommendations for future research. Finally, Chapter 6 provides the conclusion by answering the main research question.

The reading guide is shown in Figure 1.2.

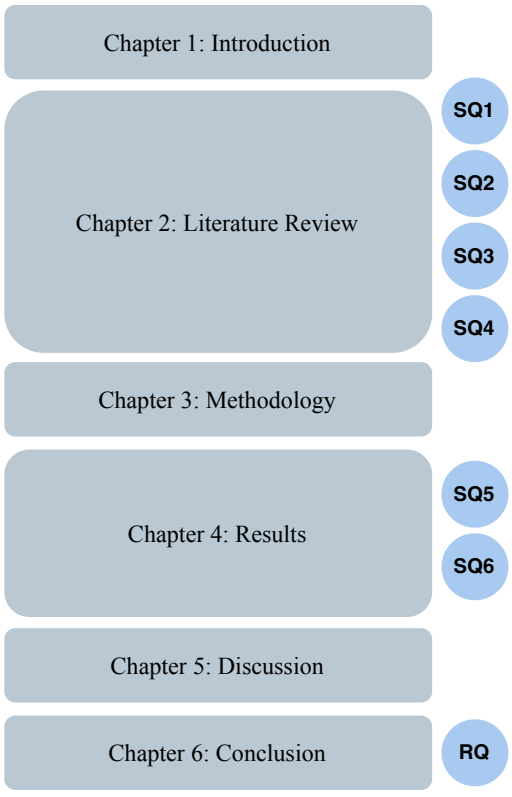

Figure 1.2: Reading guide

2

Literature Review

This chapter presents the theoretical foundation of this study by reviewing relevant literature on the current state of knowledge, thereby addressing sub-questions 1 to 4. This involves reviewing (academic) publications, books, policy documents and government reports related to realizing ambitions, the development of sustainable urban areas and transition theories. The literature study is used to gather existing knowledge on key concepts, identify known challenges in theory and explore theoretical perspectives that help explain the complexity of the field.

The chapter begins by exploring the concept of urban area development and its key characteristics. Next, the challenges associated with realizing sustainability ambitions are discussed. These challenges are then framed as wicked problems and connected to relevant transition theories that help explain the complexity of urban area development. The chapter continues with a theoretical perspective that offers promising insights into how transitions can be enabled. This forms the basis for the following section of this chapter, which examines the actors involved and their responsibilities. The chapter ends with a conclusion on the main insights from the literature review.

2.1. Urban Area Development in the Netherlands

In this section, the concept and principles of urban area development in the Dutch context are introduced. It begins with a general explanation of what urban area development entails, followed by a discussion of its legal frameworks and typical financing structures.

2.1.1. Definition and Core Aspects of Urban Area Development

In the Netherlands, there is a distinct domain of practice dedicated for designing, coordinating and implementing spatial interventions. This domain is known as *gebiedsontwikkeling*. The Dutch term *gebiedsontwikkeling* is commonly translated as urban area development. Urban area development differs from traditional urban planning. Whereas urban planning is typically associated with the specific discipline of urban planners and focuses on spatial design, urban area development is based on a broader foundation. It involves a wide range of activities and disciplines from both public and private actors and requires collaboration to design, finance, realize and manage the transformation of a defined area (Franzen et al., 2011).

As Verdaas and Verheul (2022) describes, urban area development can be understood as *"The art of connecting functions, disciplines, stakeholders, interests and financial flows, with the aim of developing or transforming a given area."* Urban area development is not just about constructing buildings or roads, but includes the creation of spaces for education, culture, sports, and leisure, such as schools, libraries, theatres, parks and community centers, which together contribute to the well-being, development and cohesion of residents.

Urban area development is a long-term process that may take anywhere from five to twenty years or more. Within this process, there are six different aspects that need to be integrated and coordinated: scale, sectors, development phases, disciplines and expertise, physical and spatial coherence and actors (Franzen et al., 2011). These six core aspects are outlined below.

1. Scale

There is no fixed spatial scale for urban area development. The Dutch word *gebied* can refer to anything from a neighbourhood to an entire region. As such, urban area development can occur at various levels depending on the context of the project. This research focuses the development, spatial transformation or expansion of parts of neighbourhoods or cities with their own identity and development objectives. This is the scale at which municipalities enter into agreements with private actors and where strategic visions are translated into concrete projects (Franzen et al., 2011). However, different spatial scales overlap. Decisions made at a national or regional level can influence development at the neighbourhood or city scale (van Randeraat, 2006).

2. Sectors

Urban area development affects and integrates a wide range of sectors. Although housing is often a key driver of urban transformation (Verdaas & Verheul, 2022), urban area development encompasses a broader range of sectoral systems of supply and demand, including working, learning, relaxing, shopping and education (Franzen et al., 2011).

3. Development Phases

Urban area development typically goes through four distinct phases. As outlined in Section 1.1, these include the initiation phase, feasibility phase, realization phase and the management- and maintenance phase (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019). Each phase involves specific decisions, risks, financial commitments and actor involvement.

4. Disciplines and Expertise

Realizing urban area development requires the integration of expertise from many fields. These include urban development, process and project management, real estate and land exploitation, spatial planning, political science and public administration (Franzen et al., 2011).

5. Physical and Spatial Coherence

A central task in urban area development is achieving a coherent spatial structure. This means aligning different urban functions, such as housing, working, mobility, public space and green infrastructure, to create a liveable and accessible area (Franzen et al., 2011).

6. Actors

Urban area development involves a wide range of actors. Each actor has their own interests, responsibilities and resources in the development process and operates or steers based on those. Key actors include public authorities (such as municipalities, provinces and the national government), private developers, investors, housing associations, entrepreneurs and local residents (Franzen et al., 2011). A more detailed overview of the actors involved in urban area development is provided in Section 2.4.

2.1.2. Legal and Policy Frameworks

Understanding the institutional context is essential to understand how urban area development unfolds in practice and what could potentially hinder the realization of ambitions.

The most important national regulatory instrument in urban area development is the Environment and Planning Act (*Dutch: Omgevingswet*). This new legislation came into effect on January 1, 2024, and applies to anyone who wants to make changes in the physical living environment. The act brings together all existing laws related to spatial planning, construction and the environment into one single legal framework. Its main goals are to speed up decision-making, allow for more flexibility, and give local governments more control. In addition, the act creates more space for private initiatives and encourages better public participation in planning and development processes (Hobma & Jong, 2022).

Under the Environment and Planning Act, every municipality is required to have a physical environment plan (*Dutch: Omgevingsplan*) for land-use policy. This plan allows municipalities to set out rules and regulations related to the physical living environment, such as building, environmental protection, noise, nature and sustainability. The physical environment plan plays a key role in shaping the financial and economic value of land and property, as it determines whether or not development is permitted. It is a legally binding document for citizens, businesses, and the government. One important implication is that municipalities can refuse a permit if a proposed building plan does not align with the physical environment plan. In principle, such conflicts mean a permit will not be granted. However, due to the dynamic nature of spatial development, there are cases where permits can still be issued, even if the plan is not in line with the current environment plan (Hobma & Jong, 2022).

In addition to formal legal instruments, municipalities also formulate policy ambitions and objectives. These policies are typically included in municipal spatial visions (*Dutch: Omgevingsvisies*) and serve as soft governance instruments. For smaller areas within these visions, masterplans are often created. While they are not legally binding in the same way as the physical environment plan, they play an important role in guiding urban area development. The visions and plans include goals, such as achieving energy-neutral neighborhoods, stimulating circular construction, or promoting affordable housing (Hobma & Jong, 2022). The ambitions examined in this research are thus embedded in policy frameworks developed by public actors. While not legally binding, they are used as a stimulating instrument for change.

Another regulatory component is the law of tenders, which occurs during the feasibility phase of urban development projects. A tender is required when a public authority, such as a municipality, allocates land or awards a contract to a private party (Franzen et al., 2011). The tender procedure not only ensures compliance with legal and ethical standards but also serves as a mechanism to stimulate innovation and quality by encouraging creative competition among private sector participants. By inviting different parties to submit proposals, public authorities can compare visions, concepts, and financial offers, ultimately selecting the plan that best aligns with objectives and ambitions.

In short, legal and policy frameworks set the boundaries within which development takes place, but also offer instruments to shape ambitions. The following paragraph explores how financing mechanisms work within this context.

2.1.3. Financing Urban Area Development

In addition to legal and policy frameworks, financing is a fundamental condition for realizing urban area development. From the perspective of integrality and scale of urban area developments, it is not unusual for financial resources to be pooled. For example, through the use of shared financing arrangements. In contrast to real estate development, where market parties are mainly in charge, urban area developments always involve a certain form of public-public and public-private co-financing,

because investments in public goals, such as infrastructure, public space and other public facilities, are needed (Heurkens et al., 2020).

To ensure the financial feasibility of urban developments, a sound business case is essential. In the Netherlands, this is traditionally assessed using the land and real estate development methodology known as GREX–VEX (Heurkens et al., 2020). As illustrated in Figure 2.1, this method evaluates feasibility based on two components: land exploitation (GREX) and real estate exploitation (VEX).

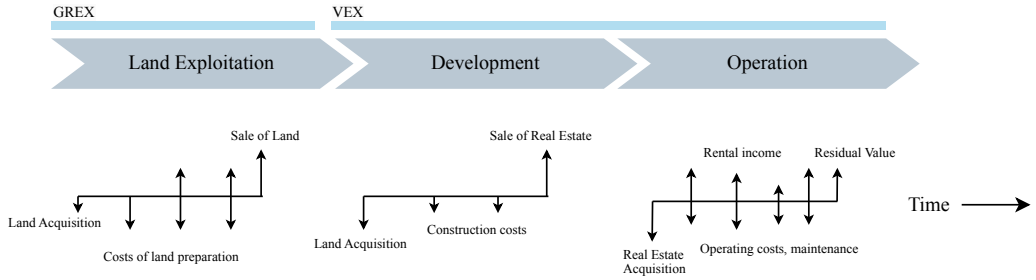

Figure 2.1: Financing urban area development (Based on Uri et al. (2021))

Land exploitation includes the costs and revenues associated with land development, such as land acquisition, preparation and the sale of land (de Zeeuw, 2018). Real estate exploitation encompasses the construction costs, sale of real estate, operating and maintenance costs and revenues from rental income. However, financial feasibility is often under pressure, as the total costs of urban development at the area level tend to exceed the direct returns. Creating a positive business case using the GREX–VEX method is therefore not always feasible in practice (Heurkens et al., 2020).

Figure 2.1 provides a structure to assess the viability of development projects. In the empirical part of this research, this structure is used to explore current challenges related to the practicality of business models.

Overall, this section has shown that urban area development is a complex process involving many actors, disciplines, phases, and legal and financial structures. The next section explores what specific challenges arise when trying to realize sustainability ambitions within this complex environment.

2.2. Challenges in Realizing Ambitions

The problem analysis in Section 1.1 highlights that sustainability ambitions are often not realized in practice. This section provides theoretical insight into this problem. Literature has been reviewed on ambitions, policies and developing sustainable urban areas in general. While not all literature is specific to the Dutch context, they form a foundation for exploring the problem more broadly. The findings from the various studies highlight a wide range of challenges identified for achieving ambitions for sustainable urban development. Given the overlap between many of these challenges, three main clusters have been identified and are discussed in detail in this section. These clusters are Financial, Policy and Regulatory, and Organizational challenges.

2.2.1. Financial Challenges

One of the most significant challenges in the realization of sustainable ambitions in urban area development is the high cost associated with sustainable measures. Candel and Törnå (2022) study the dynamics of ambition and realization of urban development in Sweden and show that developers encounter difficulties in meeting the sustainability ambitions set by municipalities. This is largely due to increased costs, especially when the benefits are unclear or only realized in the long term. Mazutis and Sweet (2022) confirm these findings in their systematic literature review of various empirical case studies. They identify multiple challenges for actors such as developers, architects and engineers, with the most significant barrier being the perception of high costs combined with uncertain returns.

Beyond the costs themselves, a lack of financial resources also forms a challenge. Galego et al. (2024) identify, in their study on barriers to effective public policies for sustainable urban development, five categories of challenges. One of these is the limited availability of financial resources within public institutions, which limits the ability to support or implement sustainability measures.

In addition, financial risk plays a crucial role (Regales, 2017). Candel and Törnå (2022) explain that developers fear rising costs, particularly when the benefits of sustainable measures are unclear or when incentives are lacking. Those risks also play a role when developers fear that consumers will not accept higher sales prices, even if such investments would yield savings in the long run (de Boer & Larsen, 2010). Mazutis and Sweet (2022) emphasize that the perception of high financial risk combined with uncertain returns remains the biggest challenge from the business side. Many companies still operate within a short-term profit maximization model, which makes them hesitant to take on long-term financial risks.

These short-term maximization business models form a challenge to sustainability. Several studies highlight that the dominant models prioritize short-term returns and struggle to account for long-term value. As Candel and Törnå (2022) note, sustainable solutions tend to increase development costs, while the potential long-term savings, such as reduced energy consumption, are difficult for developers to capture. Black et al. (2024) describe this challenge as short-termism, which they define as an excessive focus on short-term gains, such as immediate financial returns, at the expense of longer-term interests like sustainability, health and intergenerational well-being.

Lastly, there is the financial problem of split-incentives, where the party making the investment is not the one who benefits from it (Regales, 2017). This leads to a misalignment between those who bear the costs and risks, and those who receive the benefits (de Boer & Larsen, 2010).

2.2.2. Policy and Regulatory Challenges

Policy and regulatory presents a second cluster of challenges to the realization of sustainability ambitions in urban area development. One of the key challenges is the existence of fragmented or conflicting policy goals. Developers frequently face a mismatch between municipal sustainability goals and national regulations, or between environmental, social and economic goals. These conflicts make it difficult to make clear decisions (Candel & Törnå, 2022). Mazutis and Sweet (2022) describe the same issue as the fragmentation and inconsistency of legislation, regulations and policies across national, regional and municipal levels. They emphasize that regulatory conflicts make it difficult for companies to operate within a coherent and predictable framework.

Ambiguity in policy formulation further intensifies these issues. Galego et al. (2024) point to legislative ambiguity and vague sustainability objectives as key obstacles in the formulation and execution of

effective public policies. Lacking or restrictive legal frameworks can also limit the flexibility needed to implement sustainable solutions (Galego et al., 2024). For example, when legislation on ownership is unclear or missing, climate-resilient measures, such as seasonal water storage, often stall due to uncertainty about responsibilities (de Boer & Larsen, 2010).

In addition to insights from scientific literature, the website Gebiedsontwikkeling.nu offers practical knowledge that helps to understand the Dutch context of area development. Several articles highlight the stacking of ambitions as a significant obstacle. The practice of area development is frequently burdened with a long list of policy objectives, ranging from sustainable energy and climate adaptation to ecology, mobility, affordability, and safety. This so-called “shopping list”, hinders rather than stimulates the process and makes development more complex (de Jonge, 2023; Visser, 2021).

2.2.3. Organizational Challenges

In addition to financial and regulatory challenges, various organizational challenges hinder the realization of sustainability ambitions in urban area development. Although there may be overlap, since organizational problems can often lead to or reinforce financial or regulatory barriers, these challenges are considered a distinct category.

A recurring issue is the lack of sufficient human or technical resources. Galego et al. (2024) mention that the lack of these resources within public organizations, constrain the ability to design, coordinate and implement sustainable strategies. Mazutis and Sweet (2022) relate to this issue as human or technical capacity problems in the construction and real estate sector.

Collaboration across sectors and governance levels is another organizational challenge. Galego et al. (2024) highlight the lack of collaboration among public, private and civil society actors. Effective sustainable measures are often hindered by poor communication and misaligned priorities between sectors. Regales (2017) studies the structural failure to meet sustainability ambitions in area developments and emphasizes that the complexity of interplay between involved parties, each with their own interests and motivations, often leads to hesitation or a lack of meaningful collaboration. Related to this issue of collaboration, insufficient coordination between different levels of government leads to fragmented policy development, which results in sustainability being treated as an isolated issue, rather than being integrated across domains and departments (Galego et al., 2024).

Another challenge concerns knowledge and expertise. This challenge is particularly evident among professionals in the construction and real estate sectors, such as project developers, contractors and engineers, who often lack sufficient understanding of sustainable building technologies and circular design principles (Mazutis & Sweet, 2022). They emphasize that many firms continue to rely on conventional practices due to limited awareness of the latest sustainable innovations or knowledge on how to assess and implement them effectively. In addition, Galego et al. (2024) add that sustainability goals are often difficult to define and operationalize, which increases the demand for skills and expertise, which are often lacking in practice.

An overview of the challenges discussed in this section is presented in Table 2.1.

Table 2.1: Challenges in realizing sustainability ambitions

Type of challenge	Example	
Financial	High costs	(Candel & Törnå, 2022; Mazutis & Sweet, 2022)
	Lack of financial resources	(de Boer & Larsen, 2010; Galego et al., 2024)
	Financial risks	(Candel & Törnå, 2022; de Boer & Larsen, 2010; Mazutis & Sweet, 2022; Regales, 2017)
	Short-termism	(Black et al., 2024; Candel & Törnå, 2022; de Boer & Larsen, 2010; Mazutis & Sweet, 2022)
	Split-incentives	(de Boer & Larsen, 2010; Regales, 2017)
Policy and Regulatory	Conflicting policy goals	(Candel & Törnå, 2022; Mazutis & Sweet, 2022)
	Ambiguity in policy formulation	(Galego et al., 2024)
	Restrictive legal frameworks	(de Boer & Larsen, 2010; Galego et al., 2024)
	Stacking ambitions	(de Jonge, 2023; Visser, 2021)
Organizational	Lack of human or technical resources	(Galego et al., 2024; Mazutis & Sweet, 2022)
	Lack of collaboration	(Galego et al., 2024; Regales, 2017)
	Insufficient coordination	(Galego et al., 2024)
	Lack of knowledge and awareness	(Mazutis & Sweet, 2022)
	Lack of skills and expertise	(Galego et al., 2024)

These challenges and its classification provide a foundation for the empirical part of this research in Chapter 4. In addition, as the challenges go beyond purely technical or operational problems, it suggests deeper systemic issues. To explore this, the next section introduces the concepts of wicked problems and transition theories.

2.3. Wicked Problems and Transition Theories

In Section 2.1, an introduction into urban area development is given, highlighting the involvement of diverse actors, multiple spatial and temporal scales and its regulatory and financial frameworks. Section 2.2 then outlined the main challenges in realizing sustainability ambitions. Both giving insight into the complexity of urban area development and achieving sustainability ambitions within this context.

One possible reaction to this complexity might be to reduce the number of ambitions. Doing so could lead to less complexity, lower costs, fewer knowledge requirements and less conflicts. However, this overlooks the essence of what is behind setting ambitions in the first place. As Marieke van Doorninck, former alderman for Sustainability and Spatial Development in Amsterdam, emphasized: *"This is not about stacking ambitions; it is about working on the ideal city."* (Edens, 2021). Creating the ideal city, then, is not a matter of simplifying ambitions but of fundamentally transforming the systems in which they must be realized. To understand how fundamental change can be achieved and how these complex problems can be approached, scholars have developed various transition theories and frameworks. This section therefore explores the insights offered by transition theories into the complex environment of urban area development.

This section first introduces sustainable urban area development as wicked problem. Thereafter, multiple transition frameworks are introduced to gain deeper understanding into the possible underlying structures of challenges. First, the basis of transition theories is explained by the Multi-Level and Multi-Phase Perspective. These foundational models are then applied to the specific context of urban area development, drawing on insights from existing literature. Finally, this section introduces the sustainable market transformation framework as an analytical tool, that will be used further in this study.

2.3.1. Sustainable Urban Area Development as Wicked Problem

The term wicked problem was first introduced by Rittel and Webber (1973) in the context of social planning. A wicked problem describes a problem that is difficult or impossible to solve, due to their complex and interconnected nature. Wicked problems have several characteristics, including there is no clear definition of the problem, there is no opportunity to learn by trial-and-error, every wicked problem is unique, there is no immediate solution and a solution is not right or wrong (Rittel & Webber, 1973).

Urban area development is recognized as a wicked problem as cities are complex systems that reflect these characteristics (Klein Woolthuis et al., 2013). The addition of sustainability ambitions makes the challenge even more complicated. Achieving sustainable urban area development is therefore also considered a wicked problem as there is no right or wrong solution, requirements keep changing, complex dependencies play a role and every implemented solution requires investments and causes high risks (Ernst et al., 2015).

As there is no single solution to a wicked problem, their resolution requires fundamental transformations of the underlying structures of the system. To understand how these transformations can occur and wicked problems can be addressed, transition theories have been developed. These theoretical perspectives will be explained in the following paragraphs.

2.3.2. Transition Theories

Transitions are processes of structural change in societal systems such as energy, mobility, agriculture or health (Peek & Troxler, 2014). Transitions come about when dominant cultures, structures and practices in society are put under pressure by innovations or external changes. Kemp and Loorbach (2003) define transitions as the shift from an initial dynamic equilibrium to a new dynamic equilibrium, characterized by fast and slow developments as a result of interacting processes of structural change. Transition theories look beyond technological change to consider the economic, cultural, ecological and institutional dynamics that influence the success or failure of new initiatives (Loorbach, 2009).

Multi-level Perspective

Most transition theories operate on three levels: landscape, regime, and niche (see Figure 2.2). Regimes consist of sets of rules carried out by various social groups and are integrated into their culture, structures and practices. These rules provide orientation and coordination, contributing to the dynamic stability of socio-technical configurations (Ernst et al., 2015). Regimes are embedded within landscapes,

while niches exist within regimes. The landscape represents deep structural trends and external factors that shape the broader context. Niches, on the other hand, function as protected spaces where radical innovations emerge and develop (Geels, 2002). Transitions occur when pressure from landscape developments or momentum from niche innovations disrupts the existing regime, leading to changes in its structures, cultures and practices.

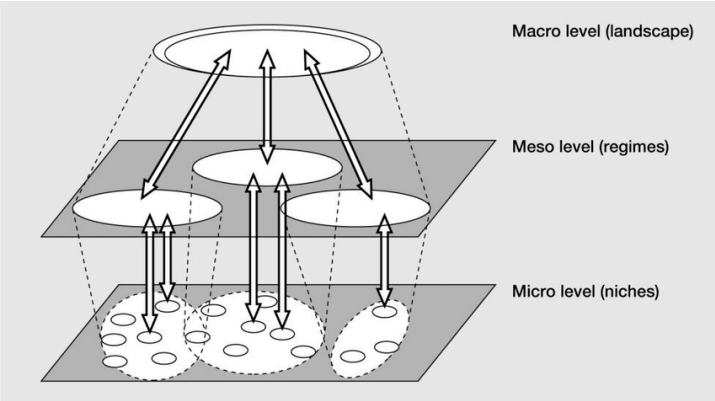

Figure 2.2: The multi-level perspective (Geels, 2002)

Multi-phase Perspective

In addition to the multi-level perspective (Geels, 2002), the multi-phase concept is also an important part of transition studies (see Figure 2.3). This model (Rotmans et al., 2001) shows that transitions do not happen in a straight line. Instead, they go through different phases, shifting from one dynamic equilibrium to another. Although transitions follow an unpredictable pattern in the short term, a more recognizable pattern becomes clear on the long-term, following a S-curve. This curve typically includes four phases: predevelopment, take-off, acceleration and stabilisation. The model highlights that transitions usually happen gradually.

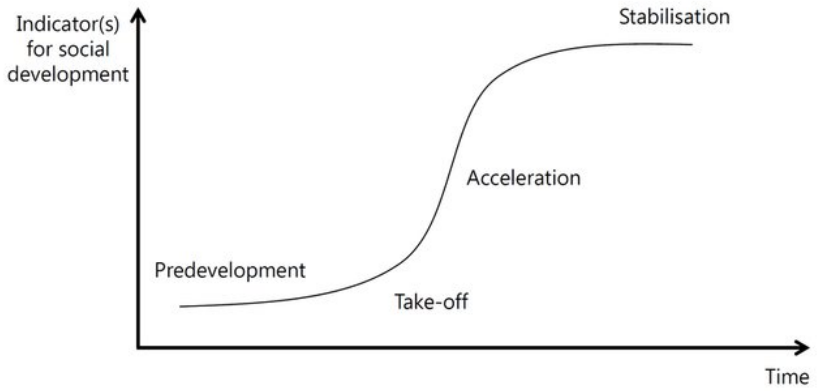

Figure 2.3: Different stages of a transition (Rotmans et al., 2001)

Transition of Urban Area Development

Peek and Troxler (2014) apply both the multi-level and multi-phase perspective to the field of urban area development, to place observed changes within a broader context.

Using the multi-phase perspective, they describe how urban area development, like many societal systems, is undergoing major changes. Traditional ways of working and business models fail under the present economic circumstances and are not able to answer to the challenges posed by climate change.

Over the past decade, urban area development has changed through distinct phases. Before the

economic crisis in 2007, large scale urban developments are characterized as top-down, led by municipalities and major project developers. These developments followed blueprint-style planning. The phase of management- and maintenance was not part of the area development process, as profits were made at the moment that land and buildings were sold to new owners and public space was transferred to the municipal management department (Peek & Troxler, 2014).

After 2007, the economic crisis led to a lack of available debt financing and a shift from a sellers' to a buyers' market. As a result, many large scale area developments came to hold. This opened up opportunities for new actors to participate directly in real estate development, such as local contractors, present land-owners and users and future users of an area. Their involvement resulted in a more bottom-up approach and smaller-scale projects. However, this type of urban area development is insufficient to meet the urgency of sustainability challenges in cities. The ability to invest on a larger scale is needed, for instance in infrastructure for renewable energy and public transportation systems. For that reason, the urban area development appears to be entering a new transition phase (Peek & Troxler, 2014).

In addition to the multi-phase perspective, Peek and Troxler (2014) apply the multi-level perspective to the field of urban area development. The research focuses on niche innovations and bottom-up experiments, revealing that these initiatives commonly address supply chain integration. Some aim for vertical integration, involving end-users or other key actors in the development process. Others focus on horizontal integration, connecting urban real estate with related sectors such as energy and water.

This ongoing transition in urban area development thus involves a broader range of sectors, actors and scales, making the already wicked problem of sustainable urban development even more complex.

Transition of Sectors within Urban Area Development

Just as Peek and Troxler (2014) analyzes the ongoing transition of urban area development, Ernst et al. (2015) aim to deepen the understanding of urban sustainability transitions by offering a conceptual framework. In their framework, they distinguish three interconnected dimensions of transition processes in urban contexts: (1) Sustainable places and their management and usage, (2) The sustainability transition of the urban development regime, (3) Sustainability transitions in related societal sectors.

The second dimension, the sustainability transition of the urban development regime, aligns with the transition described by Peek and Troxler (2014). Both research highlight how existing regimes are evolving due to changes in culture, structure and practices. However, while Peek and Troxler (2014) acknowledge the growing importance of horizontal integration with other sectors, Ernst et al. (2015) go a step further by noting that these sectors, such as urban water management, energy systems and transport, are also undergoing their own fundamental transitions. Thus, in urban settings, multiple sustainability transitions converge, interact and co-evolve. These sectors are all undergoing structural change themselves, while simultaneously shaping the conditions for the transition of the sustainable urban development regime (Ernst et al., 2015).

In addition to the three sectoral transitions identified by Ernst et al. (2015), a broader set of transition challenges influences urban area development. Nillesen (2023), professor at TU Delft, outlines nine thematic transition domains that shape the future of cities. These domains are:

1. Water
2. Energy
3. Mobility
4. Circularity
5. Health and Wellbeing
6. Urbanization
7. Data
8. Ecology
9. Agriculture

These thematic domains are not only undergoing transformation themselves, but are also integrated into the overarching transition of urban area development. In other words, these transitions function

both as independent processes of change and as building blocks of the broader transition of urban area development.

In conclusion, urban area development is undergoing a fundamental transition, as described by Peek and Troxler (2014). At the same time, related domains, such as energy, water, and mobility, are experiencing their own transitions, which interact with and influence the transformation of the urban development regime (Ernst et al., 2015). Moreover, as Nillesen (2023) points out, a broader set of thematic transition domains is shaping the future of cities. These domains are not only changing independently, but are also embedded in the larger transition of urban area development. Figure 2.4, visualizes these insights by illustrating how these transition domains are present within the complex environment of urban area development.

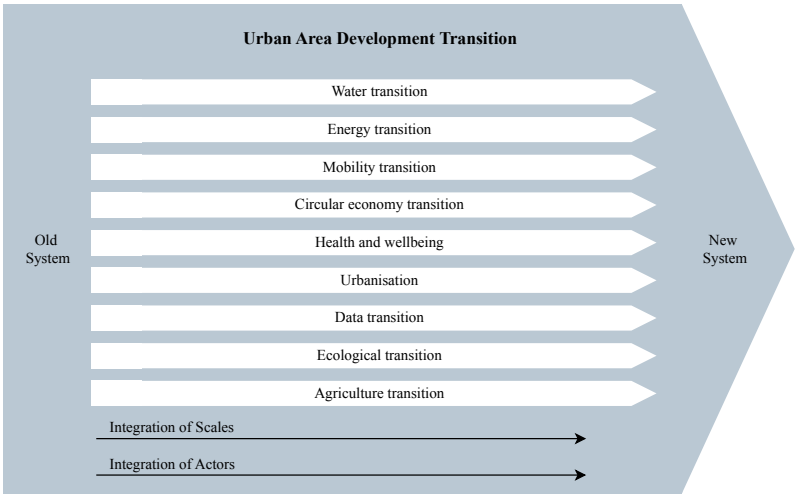

Figure 2.4: Urban area development in transition

Identifying the systemic changes required to realize ambitions highlight the multi-layered complexity involved in achieving sustainability ambitions within the urban environment. The multi-level (Geels, 2002) and multi-phase (Rotmans et al., 2001) perspectives, together with the application to urban area development, provide a foundation for understanding the dynamics of sustainability transitions. To gain a deeper understanding of why sustainability ambitions are often not achieved, and how this might be enabled, an additional perspective can provide valuable insights. As Klein Woolthuis et al. (2013) emphasize, wicked problems can only be addressed by including multiple stakeholders.

The sustainable market transformation theory (Nijhof et al., 2022) builds on the insights of transition theories and adds a different perspective. The theory focuses on how various actors work together to shape the conditions needed for sustainable outcomes. The theory moves beyond a purely governance-oriented or niche innovation perspective. As such, the framework may provide valuable insights into enabling sustainability ambitions. It takes a more holistic perspective, acknowledging the roles of all actors involved in processes of change. Referring to the transformation as a market transformation can therefore be misleading, as the market in urban area development can be primarily associated with the developers. Therefore, the term *sustainable transformation* is used from this point forward.

In the next paragraph, the sustainable transformation theory is explained in more detail. First, the difference in terminology between transition and transformation is discussed.

Transition and Transformation

In this research, the concept of transition has been central. Transition theory focuses on long-term, structural changes in societal systems involving shifts in culture, structure and practices (Geels, 2002; Rotmans et al., 2001).

Within the theory of sustainable transformation, however, the term transformation is used instead of transition. The terms transition and transformation are often used interchangeably in academic literature. A systematic literature review by Rau et al. (2018) analyzed 258 academic publications and found limited conceptual clarity about the differences of transitions, transformations and regime shifts. Many studies use these concepts without clear definitions or consistent distinctions. Particularly between transition and transformation, the boundaries remain vague and overlapping. However, small differences in emphasis and origin have been found. Figure 2.5 provides an overview of the key differences from this study .

	Transformation	Transition	Regime shift
Driver of change	Human-induced	Human-induced	Loss of ecological resilience (often human-induced)
Changed/targeted system	Social/socio-ecological, economic, political/institutional	Social/ecological	Ecological system
Speed of change	Gradual	Incremental or gradual (?)	Abrupt
Outcome	More beneficial system (e.g., more sustainable)	Depending on the system, e.g., forest cover gain for forest transition	Less desired ecological state
Solution-oriented/ problem-oriented	Solution-oriented	Problem-oriented	Problem-oriented
Reversibility	Hardly possible (?)	Possible (?)	Not or hardly reversible
Stakeholder involvement	Yes	Yes	No

Figure 2.5: Transition and transformation (Rau et al., 2018)

Both transitions and transformations offer perspectives on how to describe, interpret and support societal change. As Hölscher et al. (2018) emphasize, the differences between the concepts stem only partially from their etymological roots but are largely shaped by the distinct research communities in which they developed.

However, some scholars do propose clearer distinctions. For instance, Schuijt (2023) argues that transformation refers to deep changes that occur within an organization, requiring a change in existing assumptions, structures and models. In contrast, transition refers to a broader, systemic shift that involves multiple organizations and actors, affecting the entire system in which they operate.

The sustainable transformation theory aims to guide the shift of an entire system toward more sustainable outcomes, involving multiple organizations and actors. This implies that it can be classified as a transition theory. This is consistent with how the model is presented by its developers. Nyenrode Business University, which co-developed the theory, explicitly refers to it as part of a transition framework: “The study elaborated on four sequential *transition phases*: inception, competition, synergy and institutionalization.” (Nyenrode Business Universiteit, 2022). Furthermore, in a subsequent publication introducing a different framework, the authors again describe the sustainable transformation theory as one of two leading *transition theories* on which the new model is based (Simons et al., 2023).

Based on this literature, it is concluded that the sustainable transformation theory is best understood as a transition theory. However, because it focuses on human-induced, solution-oriented change towards a more beneficial system, it may also be referred to as a transformation framework. Building on the theoretical foundations of transition thinking, this study applies both terms. While the term transformation is used in line with the terminology of the theory, the concept is interpreted within the broader context of transition studies.

Finally, it is important to note that in the context of urban area development, the term transformation is also used in different sense, referring specifically to the physical or spatial transformation of an area. The concept of transformation in the sustainable transformation theory concerns broader systemic change, beyond spatial redevelopment.

2.3.3. Sustainable Transformation Theory

The sustainable transformation is a theory developed by Professor André Nijhof (Nyenrode Business Universiteit) and Lucas Simons (NewForesight). Sustainable transformation is defined as *”a non-linear and structural shift in a system from an initial state that entails the implementation of behavioral patterns resulting in unsustainable outcomes towards a state that entails the implementation of different*

behavioral patterns resulting in outcomes which take into account environmental, social and economic aspects of sustainability" (Nijhof et al., 2022). This definition makes the theory particularly relevant for understanding the realization of sustainability ambitions, as it focuses on the shift toward sustainable outcomes. The theory integrates the scientific disciplines of the systems theory and the evolutionary economics with transition management (Nijhof et al., 2022).

Systems Theory

A complex social system consists of the interrelationship between institutions, groups and individuals that operate together for a common purpose (Nijhof et al., 2022). Within these relationships, reinforcing and balancing feedback loops play a central role and interact in a non-linear way. Systems theory also identifies leverage points that enable systemic change. In the transformation approach, these leverage points are translated into interventions that different actors can implement to drive transformation (Het Groene Brein, 2021).

Evolutionary Economics

Systems theory has been further developed in the context of markets through evolutionary economics. The transformation perspective focuses on new business models, scaling strategies, and market mechanisms that drive transitions toward higher levels of sustainability. Evolutionary economics views economic change as a dynamic process shaped by the interactions between five key actors: governments, Industry, NGOs, financial institutions and knowledge institutes (Het Groene Brein, 2021).

The sustainable transformation theory assumes that a system is maintained by two main forces: the enabling environment and the market dynamics (Nijhof et al., 2022). The enabling environment includes the rules, structures an conditions, such as policies, laws and financial incentives, that support, strengthen or fail to correct the dominant collective behavior of all actors in the system. Market dynamics refers to what is rewarded or competed on in the market, such as profits or prices. Together, these two forces create a stable system. This stability is difficult to break because the system continues to reinforce the same patterns of behavior. According to Nijhof et al. (2022), a sustainable transformation requires breaking this pattern of collective behavior.

Actors Involved in System Change

Nijhof et al. (2022) emphasize the importance of actors engaging in interventions to modify the patterns of collective behavior. Rather than focusing transitions on government actions or niche innovations, the transformation theory posits that five key actors play a crucial role:

1. Governments
2. Industry
3. NGOs
4. Financial Institutions
5. Knowledge Institutes

These five actor groups each operate based on their own roles and interests within a market system. **Governments** establish the legal and regulatory frameworks that shape market behavior, and influence actions through instruments such as taxation, subsidies and permitting. **Industry** act as providers of goods and services, driven by profit motives and market competition. **NGOs** represent societal interests and actively bring issues such as environmental or social concerns to the public and political agenda. **Financial institutions** enable economic activity by providing capital through loans, insurance and investments. Finally, **Knowledge institutes** contribute as sources of expertise and innovation by developing new insights, methods, and technologies. By implementing interventions, these actors can actively shape system dynamics and drive change towards achieving sustainable outcomes (Het Groene Brein, 2021).

In Section 2.4, this actor component of the theoretical framework is applied to the context of urban area development, in order to explore which actors can drive change and how they can help enable sustainability ambitions. First, the phase component of the theoretical framework is discussed in the next paragraph.

Phases in Sustainable Transformation

The process of change unfolds in a series of distinct but interrelated phases. Each phase requires the active involvement of all five actor groups, each fulfilling different roles in different phases. The theory identifies four phases: inception, competitive advantage, synergy and institutionalization (see Figure 2.6).

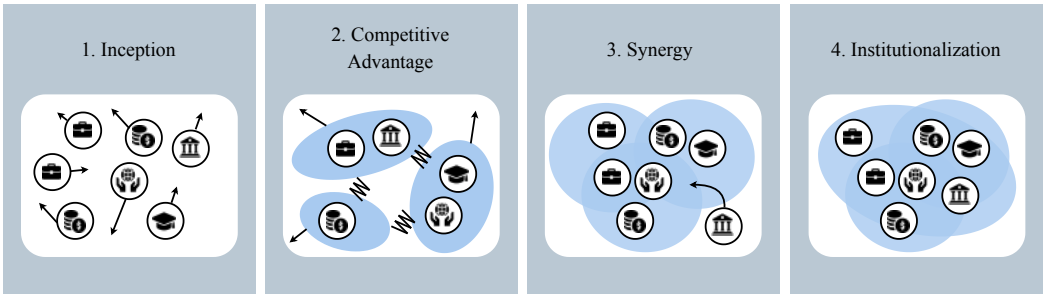

Figure 2.6: The four phases of the sustainable transformation theory

Phase 1, the **inception** phase, begins when a sustainability crisis arises. During this stage, various isolated actions and experiments take place, which address symptoms rather than root causes. These fragmented efforts lack coordination. In Phase 2, the **competitive advantage** phase, actors start leveraging sustainability as a competitive advantage. However, competition remains the driving force, preventing cooperation. Phase 3, the **synergy** phase, marks a shift toward coalition-building and non-competitive collaboration. A diverse group of actors forms a "coalition of the willing", working collectively to develop a shared strategy in support of sustainability transitions. This phase is particularly challenging, as actors must balance individual interests while striving to align on a common strategy for sustainability. In the final phase, **institutionalization**, sustainability becomes embedded in the system through laws and regulations. The market environment now structurally supports and rewards sustainable behavior (Nijhof et al., 2022).

For a sustainable transformation to succeed, coordination between actors is essential. As one of the developers of the theory explains: *"Successful sustainable transformation is like making music. We don't create music when all instruments play over each other in chaos. Music happens when we agree on who plays what, and when, but also when certain players must stop and allow silence. It is through coordination that noise becomes music (Nijhof, 2024)."*

Progress through the phases of transformation cannot happen in isolation and actors must be aligned to move forward. If one of the five actor groups falls behind, for example, when one actor is operating in Phase 4 while others are still in Phase 1, the system will remain stuck, and the transformation process stalls. To enable systemic progress, each actor must take responsibility and fulfill their role in every phase. Appendix D explains the responsibilities and roles of the different actors within each phase according to the sustainable transformation theory (Nijhof et al., 2022).

In Section 4.8, this phase component of the sustainable transformation framework is used as an analytical lens to examine the interview results. It helps to further understand the challenges that actors experience in realizing sustainability ambitions in urban areas.

By linking ambitions to broader societal transitions, this research offers a deep perspective on understanding the realization of sustainability ambitions in urban area development. Transition literature connects the issue not only to technical or policy-related aspects, but also to the underlying systemic changes that are required. The chosen theoretical framework, with its emphasis on a multi-actor perspective, provides a valuable lens for analyzing the problem of ambition realization. Therefore, this lens is first applied to the perspective of actors involved in urban area development.

2.4. Actors and their Responsibilities

As discussed in Section 2.1, actors are one of the six core aspects of urban area development. The sustainable transformation theory identifies five key actor groups that play a role in system change for achieving sustainable outcomes: governments, industry, NGOs, financial institutions and knowledge institutes.

This section provides a detailed overview of the actors involved in urban area development categorized according to these five actor groups. In doing so, it goes beyond the common public-private division found in most literature. First, the specific actors within each group and their role within the context of urban area development are described. The section ends by highlighting how many actors take on overlapping responsibilities.

2.4.1. Governments

Multiple governmental parties at different spatial scales play a role in urban area development in the Netherlands. A distinction is made between the European Union, the National Government, Provinces, Municipalities and Public Organizations (e.g. Rijkswaterstaat).

The European Union

The European Union represents the highest level of governance. It provides direction primarily through overarching policy visions and European targets, for instance related to climate or energy. The EU contributes to urban area development in the Netherlands through subsidies, policy frameworks and regulations. The EU has introduced directives such as the Habitats Directive and the Air Quality Directive, which are subsequently transposed into national legislation by the national government (Zonneveld et al., 2011).

The National Government

The national government influences urban area development by steering at a strategic level through legislation, visions, policies and financial incentives (Franzen et al., 2011). For example, the National Environmental Vision (NOVI) and the Environment and Planning Act, discussed in Section 2.1.2, are key instruments made by the national government. The NOVI outlines the long-term vision for the development and management of the physical environment in the Netherlands, while the Environment and Planning Act consolidates and simplifies the legal framework for spatial development and the physical environment. The financial resources of the national government stem mainly from taxes, including income tax, VAT and excise duties. These resources are distributed to lower levels of government through general and specific funds (Rijksoverheid, 2023).

Provinces

Provinces primarily focus on regulating and coordinating developments within the framework of national policies (de Zeeuw, 2018). Provinces derive income from the provincial fund and specific transfers from the national government. They finance their own projects and may provide subsidies to municipalities (Rijksoverheid, 2023). However, the influence of provinces on urban area development is generally considered limited (Pors, 2012).

Municipalities

Municipalities fulfill multiple roles in urban area development. They are responsible for land-use planning, granting building permits and may also engage in active land policy through direct participation in development projects. This often involves setting up public-private partnerships (PPPs) in which they can participate as a partner in the development. In some cases, municipalities also take on the role of project or process manager (Franzen et al., 2011).

Although municipalities are often viewed as a single actor, they are internally divided into departments with distinct tasks and interests. Common departments include spatial planning, economic affairs, traffic and transport and municipal real estate. If the expertise is not available in-house or when a second opinion is needed, municipalities can also lease services to external consultants (Franzen et al., 2011).

Pors (2012) identifies five main internal actors within municipalities that influence urban area development: the department for development, the department for spatial quality, other municipal sectors, the municipal council and the Board of Mayor and Aldermen. These internal actors are outlined below.

The department for development refers to the municipal service or unit responsible for drafting and executing development and allocation policies. In practice, this department can have different names, such as Land Affairs, Spatial Development or Area Development. It acts as a public developer, using municipal land positions and finances to facilitate the physical development of the city (Pors, 2012).

The department for spatial quality aims to achieve coherent spatial development within the area. In practice, these departments are often named Spatial Planning, Urban Design or Public Housing. Their primary focus is the development of policy documents that guide and frame urban development. Available instruments include policy documents, zoning plans and urban or master plans (Pors, 2012). While the department for development focuses on implementation and project realization, the spatial quality department emphasizes policy formulation and regulation.

Other municipal sectors include a range of policy domains such as economy, transport, environment, social affairs, sports and education. These departments support urban area development when projects intersect with their policy fields (Pors, 2012).

The municipal council is the highest governing body within a municipality. Council members determine the main policy directions of the municipality and oversee the proper implementation of these policies by the Board of Mayor and Aldermen. They are also responsible for approving the municipal budget and auditing the annual financial report (Rijksoverheid, n.d.).

The Board of Mayor and Aldermen implements the policies decided by the municipal council. Aldermen operate under political leadership and are typically replaced every four years. In addition, they are responsible for ensuring that regulations and laws from the provincial and national government are properly enforced at the municipal level (Rijksoverheid, n.d.).

In addition to their regulatory and executive roles, municipalities also play a financial role in urban area development. They may invest in land, infrastructure and public amenities, provide subsidies or loans or manage public funds (Gemeente Rotterdam, n.d.; Heurkens et al., 2020). Traditionally, the government is expected to pay for public space, meaning that municipal funding mainly supports social and public goals. The aim is to encourage investments that benefit society (Heurkens et al., 2020). To do so, municipalities receive funding from the national government via the municipal fund. Typically, a finance or economic affairs department, grouped within the *other municipal sectors*, distributes the funds across policy fields. Since municipal tax autonomy is limited, municipalities are highly dependent on the municipal fund for their revenue base (Rijksoverheid, 2023).

Public Organizations

Public organizations are independently operating units that deal with government-owned properties. These organizations can also be essential players in urban area development (Franzen et al., 2011). In addition to Rijkswaterstaat, an executive agency of the Ministry of Infrastructure and Water Management, responsible for both policy formulation and implementation in the Netherlands' physical domain, Staatsbosbeheer also falls within this category of public organizations. Staatsbosbeheer is a legal entity with a statutory mandate, operating under the Ministry of Agriculture, Fisheries, Food Security and Nature. It is an independent administrative body, but remains a public organization. Staatsbosbeheer fulfils a broad societal role and is not solely a nature conservation organization in the traditional sense. It plays an important role in the realization of both national and international nature objectives (Staatsbosbeheer, n.d.)

2.4.2. Industry

The second actor group is the industry, which refers to private organizations that act as providers of goods and services in shaping the urban environment. These actors are commercially driven and are involved in the design, development, construction and delivery of urban areas and buildings. A wide range of actors involved in urban area development can be categorized within this group, including developers, housing associations, engineering and consultancy firms, design and construction actors, estate agents and utility companies. Each of these actors contributes specific knowledge, services or products to the development process. Each actor type is discussed in more detail below.

Developers

Developers play a significant role in nearly all urban area developments by actively participating in public private partnerships. Their involvement is at their own expense and risk within the context of the current market (Franzen et al., 2011). Developers play a role in connecting various stakeholders by converting investors' requirements into concepts that architects can effectively design and implement. Developers can be distinguished in short-term and long-term developers (de Zeeuw, 2018). In the Dutch context, long-term developers are gaining importance. These actors are not solely focused on completing and selling buildings, but remain involved after delivery and bear financial responsibility for the long-term success of the development. This short-term and long-term distinction between developers links to the various types of developers distinguished by Heurkens et al. (2020), such as independent developers (pure developers), developing contractors and developing investors. The latter, takes on the long-term developer role (Heurkens et al., 2020). In the remainder of this research, the term developers refers specifically to pure developers.

Developers play an important role in the financing of urban area development, focused on funding real estate. Typically, they contribute between 20 and 50 percent of the required capital from their own equity. To complete the financial structure of a project, developers often need to attract external funding, usually in the form of bank loans or institutional investments (Heurkens et al., 2020).

Housing Associations

In the Netherlands, housing associations play a crucial role in urban area development, particularly in the provision of affordable housing. In recent years, their role has changed from operating within a government-directed framework to being financially independent. This turned them into private-sector players in urban area development and expanded their focus beyond social housing to including more integrated development projects (Franzen et al., 2011). Housing associations take on various roles in urban area development. Although they operate with their own business model, they are formally registered as foundations and have a societal objective. Depending on the context, they may act like developers, taking the lead in project initiation, design and realization of housing projects. Furthermore, they often own land and real estate portfolios, giving them a spatial and financial position in the development process (Heurkens et al., 2020).

Engineering and Consultancy Firms

Engineering firms are important private actors in urban area development (Franzen et al., 2011). They provide specialized expertise throughout both the planning and construction phases, offering guidance on technical, spatial, financial and organizational aspects of projects. While consultancy firms are sometimes separate from engineering firms, their roles often overlap and are therefore considered together here. Engineering and consultancy firms usually operate under contract for private clients or public parties.

Design and Construction Actors

Design and Construction actors include builders, designers, architects and suppliers, who all contribute to the materialization of urban area development. Despite often being commissioned for specific phases of the project, their influence extends further, as their designs and constructions shape the long-term spatial and functional quality of an area (Franzen et al., 2011). Similar to engineering and consultancy firms, these actors typically operate under contract for either private clients or public authorities. *Builders* are responsible for the construction process and ensure compliance with relevant regulations and building codes. Once construction is completed, they generally withdraw from the process, as they do not retain ownership or remain involved during the management and maintenance phase (Clardie, 2024). *Designers and Architects* develop the visual and spatial concepts for buildings and public space. Their work forms the basis for how areas are experienced, both aesthetically and functionally, and thus plays a crucial role in defining the character of the development (Franzen et al., 2011). Finally, *Suppliers* are primarily involved during the construction phase, delivering the materials and systems needed to physically realize the development (Heurkens et al., 2020).

Estate Agents

Estate agents play a role in urban area development, particularly during the realization, and management- and maintenance phase. In the realization phase, they act as intermediaries in the sale or lease of build-

ings. In the management- and maintenance phase, they support and manage the properties (Franzen et al., 2011; Heurkens et al., 2020).

Utility Companies

Utility companies, such as energy providers, water boards, healthcare institutions and technology firms, are increasingly recognized as relevant actors in urban area development (Heurkens et al., 2020). These organizations contribute essential services like energy, water and digital infrastructure and operate largely as private or semi-private actors (Franzen et al., 2011). Their role is mostly limited to the management- and maintenance phase of a development (Heurkens et al., 2020).

2.4.3. NGOs

The third actor group is non-governmental organisations (NGOs). This is a collective term for organizations that operate independently from the government and aim to achieve a specific social, environmental or scientific goal. NGOs are non-profit entities and typically rely on volunteers, donations or subsidies (Rijksoverheid, 2022). In the context of urban area development, NGOs can contribute in various ways, from advocacy and consultation to direct involvement in projects. Three types of NGOs can be distinguished in this context: interest groups, environmental organizations and organized civil society (Franzen et al., 2011). These are discussed in more detail below.

Interest Groups

Volunteer interest groups, including advocacy organizations like the Fietsersbond, represent the rights and needs of specific societal groups, for example by promoting active mobility or accessible infrastructure. In urban area development, interest groups are often involved in participatory processes initiated by municipalities or developers. Through public consultations, advisory boards or stakeholder meetings, they provide input on plans and raise awareness of specific user needs (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022).

Environmental Organizations

Environmental organizations, such as Natuurmonumenten, Greenpeace and Milieudefensie, primarily advocate for the protection of nature, ecosystems and the interests of future generations (Franzen et al., 2011). Their involvement in urban area development can range from advocacy to direct participation in planning processes. Some, like Natuurmonumenten, even take on a development role by actively shaping or managing green landscapes.

Organized Civil Society

Organized civil society refers to resident collectives such as energy cooperatives, neighborhood associations and citizen initiatives. In the Netherlands, there are currently more than 700 active resident initiatives. These groups support neighborhoods or municipalities by promoting energy efficiency, developing green spaces through projects like urban gardens or green roofs and organizing activities that strengthen social cohesion. Among these, cooperatives represent a more formalized type of initiative with legal status, designed to enable members to collaborate toward achieving a common goal (HIER klimaatstichting, 2025). In some cases, resident collectives also make financial contributions to initiatives and thereby act as both societal and financial stakeholders. This may occur through membership fees, co-financing of specific projects, or through crowdfunding campaigns (Coöperatie Bommelerwaar, n.d.).

2.4.4. Financial Institutions

Financial institutions in urban area development are responsible for providing capital for the development. This fourth actor group consist of various actors, including banks, institutional investors (e.g. pension funds and insurance companies) and property investors.

Banks

Banks provide loans to developing parties for the development of real estate. These loans are an important source of financing for urban area developments. Despite the stricter supervision that banks experience when issuing loans to external parties, as a result from European legislation, such as the EU Taxonomy, banks remain active in urban area development. Their primary objective is to achieve

financial returns on their investments. Investments in real estate and area developments are considered high-risk profiles for banks, which is reflected in relatively high interest rates on loans (Heurkens et al., 2020). In addition to private parties, public parties can also obtain loans through a specific bank, the Bank Nederlandse Gemeenten (BNG). These loans are often offered under favorable conditions and at relatively low interest rates (Heurkens et al., 2020).

Institutional Investors

Investors invest capital with a long-term horizon, aiming for stable returns. There are various types of investors distinguished by Franzen et al. (2011), including institutional investors, such as pension funds and insurance companies. These investors allocate their investment portfolios to existing real estate assets through investment funds. Thus, institutional investors do not invest directly in area development projects, but indirectly through funds. As a result, they do not carry direct financial risk for financing developments but instead invest in the sustainability, transformation and operation of existing real estate (Heurkens et al., 2020).

Property Investors

Property investors also invest money on a long-term basis. They invest in, manage and operate real estate assets, often on behalf of institutional investors or private individuals (Franzen et al., 2011). Their central goal is to achieve financial returns with relatively low risk (Heurkens et al., 2020). After project completion, they can act as clients by purchasing developed properties from developers and adding them to their investment portfolios.

2.4.5. Knowledge Institutes

Knowledge institutes are not explicitly defined as stakeholders in urban area development literature (Franzen et al., 2011; Heurkens et al., 2020; Pors, 2012). Nevertheless, in practice, many knowledge institutes are actively conducting research on sustainable urban area development. In contrast to their absence from the classical urban development stakeholder framework, Nijhof et al. (2022) highlight the essential role of knowledge institutes in sustainability transitions. Although they are not typically directly involved in development processes, they can be crucial actors of change. This actor group can be divided into academic institutions and independent research institutes, both of which are discussed in the context of urban area development below.

Academic Institutions

Within the Dutch knowledge landscape, many universities are engaged in themes related to sustainable urban area development. As urban area development is an interdisciplinary domain, it includes a wide range of academic fields, such as public administration, economics, law, real estate, urban planning, design, environmental sciences, information science, psychology and many others (Verdaas, 2019). As such, universities approach the subject from different academic perspectives.

For instance, The Faculty of Spatial Sciences at the University of Groningen conducts research on spatial planning, urban geography and regional development (University of Groningen, n.d.). The Erasmus School of Social and Behavioral Sciences focuses on the institutional, economic, and societal dynamics of urban development, including themes such as sustainability and the impact of societal change (Erasmus University Rotterdam, n.d.). Wageningen University & Research contributes expertise in climate-adaptive planning and nature-based solutions in urban environments (Wageningen University & Research, n.d.). At Delft University of Technology, a dedicated chair on urban area development conducts research and offers education on this topic (Delft University of Technology, n.d.).

Independent Research Institutes

Several independent research institutes are actively involved in themes related to urban area development. These institutes often operate on the interface between science, policy and practice, and contribute through research, policy evaluations and the development of tools that could support decision-making. Examples of these independent institutes are the Netherlands Organisation for Applied Scientific Research (TNO), The Netherlands Environmental Assessment Agency (PBL) and Amsterdam Institute for Advanced Metropolitan Solutions (AMS Institute) (AMS Institute, n.d.; Planbureau voor de Leefomgeving, n.d.; TNO, n.d.). While these institutes are often referred to as independent, they typically provide both demand-driven and unsolicited research and advice.

In addition to these institutes, the Netherlands has wide range of research institutes that contribute to more specific aspects of urban area development, both upon request and on their own initiative. These institutes cover disciplines such as water management, through institutions like Deltares (Niesten, 2023), and public health, through institutes such as National Institute for Public Health and the Environment (RIVM) (Keijsers & Staatsen, 2025).

2.4.6. Roles and Responsibilities

While all actors involved in urban area development can primarily be categorized into one of the five actor groups, their actual behavior and responsibilities in practice often transcend these boundaries. The grouping of the actors within the five actor groups of the sustainable transformation theory, therefore, reveals further insight into the complexity of urban area development, when compared to regular market systems.

The conventional division of roles that is typically present in regular market systems, as described in Section 2.3.3 is that governments establish the legal and regulatory framework, industry delivers products and services, NGOs advocate for public values, financial institutions provide capital and knowledge institutes contribute through research and innovation (Het Groene Brein, 2021).

The system of actors involved in urban area development reveals a complex and overlapping distribution of roles. Many actors operate across multiple domains. While they may belong to one primary category, they engage in activities typically associated with others. These overlapping roles are explained in the following paragraph on cross domain responsibilities.

Cross Domain Responsibilities

Municipalities are primarily categorized under the government actor group due to their regulatory responsibilities. The department for spatial quality, which focuses on developing policy documents that guide and frame urban development, is a part of the municipality that fits within this category. However, municipalities also hold an executive role in project and process management. Within this context, the department for development acts as a public developer, responsible for executing development activities. This role aligns with the industry category. Additionally, municipal management and maintenance departments fulfill industrial functions through the delivery of public services. Beyond their governmental and industrial roles, municipalities also operate as financial institutions, by providing capital for public infrastructure and amenities.

Housing associations are primarily considered part of the industry category, as they develop and manage real estate projects. However, their societal mission positions them as NGOs, as they advocate for public values such as affordable and inclusive housing. Moreover, housing associations are financial actors in urban area development. They may own land and provide capital for the realization of housing, giving them influence over both the spatial and financial aspects of development.

Engineering and consultancy firms, although part of the industry, play an important role as knowledge providers. They contribute by conducting research, offering advice and translating lessons across projects and contexts.

Environmental organizations, such as Natuurmonumenten, are primarily classified as NGOs due to their advocacy role. However, their role in urban area development extends beyond traditional NGO activities. These organizations often act as landowners and developers, therefore taking responsibilities typically associated with the industry category. Moreover, by co-financing initiatives and managing lands, they also fulfill functions related to financial institutions.

Finally, organized civil society, such as cooperatives and citizen initiatives, are primarily categorized as NGOs. However, through financial contributions or co-financing of projects, they also fulfill a financial role in urban area development.

These cross domain responsibilities show the dynamic nature of the actor system in urban area development and are summarized in Table 2.2. The overlapping roles and responsibilities were validated through the interviews and are presented in the empirical findings in Section 4.7.

Table 2.2: Actor roles in urban area development

Actor	Primary role	Secondary role	Tertiary role
European Union	Governments	Financial Institution	
National Government	Governments	Financial Institution	
Provinces	Governments	Financial Institution	
Municipalities	Governments	Industry	Financial Institution
Public Organizations	Governments	Industry	
Developers	Industry	Financial Institution	
Housing Associations	Industry	NGOs	Financial institution
Engineering and Consultancy	Industry	Knowledge Institutes	
Builders	Industry		
Designers	Industry		
Architects	Industry		
Suppliers	Industry		
Estate agents	Industry		
Utility Companies	Industry		
Interest Group	NGOs		
Environmental Organizations	NGOs	Industry	Financial Institution
Organized Civil Society	NGOs	Financial Institution	
Banks	Financial Institution		
Institutional Investors	Financial Institution		
Property Investors	Financial Institution		
Academic Institutions	Knowledge Institutes		
Research Institutes	Knowledge Institutes		

2.5. Conclusion Literature Review

The theoretical research reveals that achieving sustainability ambitions in urban area development is highly complex. By linking ambitions to broader societal transitions, it becomes clear that multiple problem domains are each undergoing their own transition. At the same time, the broader practice of urban area development itself is in transition.

The sustainable transformation theory shows that transitions depend on the actions of multiple actors, extending beyond the traditional public-private actor division. This justifies a broad focus on the diverse actors involved in urban area development, allowing for a better understanding of the complexity in enabling sustainability ambitions in this environment.

However, it remains unclear what challenges the different actor groups experience in practice and how these actor specific challenges further relate to the transition process of urban area development. Yet, this understanding is essential for identifying how sustainability ambitions within the complex environment of urban area development can eventually be enabled.

To explore these questions, this study combines insights from the literature review on both actor groups and categories of challenges (financial, policy and regulatory, and organizational). This combination serves as a **conceptual structure** (Figure 2.7) for the empirical research, offering a foundation through which the challenges experienced by different actors in urban area development can be examined. The five actor groups are presented in this structure, and specific choices regarding subgroups are further explained in the methodology in Chapter 3.

Actor Group	**Governments**	**Industry**			**NGOs**	**Financial Institution**				**Knowledge Institutes**
Sub Group	***Municipalities***	***Developers***	***Housing Associations***	***Engineering and Consultancy***	***Environmental Organizations***	***Banks***	***Insurers***	***Institutional investors***	***Property investors***	***Academic Institutions / Research Institutes***
Financial										
Policy and regulatory										
Organizational										

Figure 2.7: Conceptual structure

In addition, the **phase component** of the sustainable transformation theory will be used as a framework to examine how these challenges are further embedded in the broader system dynamics.

To gain the necessary insights, empirical research is conducted through interviews with actors representing each of the five actor groups defined in the sustainable transformation theory. First, the methodology is presented in the next chapter.

3

Research Methodology

This chapter outlines the methodology applied in this study. It begins by describing the data collection process, including the chosen method, the interview protocol, the criteria used to select relevant respondents and an overview of the interview participants. These interviews were conducted to gain practical insights into the challenges of realizing sustainability ambitions in urban area development.

Thereafter, the method of analysis is presented, explaining how the collected data was processed and analyzed in relation to the theoretical framework. The chapter concludes with a reflection on the ethical considerations relevant to this research.

3.1. Data Collection

This section describes the process of data collection. The literature review served as an input for the empirical research in multiple ways. It shaped the interview topics, helped identifying relevant respondents and led to the development of a conceptual structure used to organize actor-specific challenges. Additionally, it provided the foundation for applying the phase component of the sustainable transformation theory. The following subsections describe the data collection method, interview participant selection criteria, interview protocol and an overview of the interviewees.

3.1.1. Method of Data Collection

This research seeks to investigate what transition theories can contribute to enabling sustainability ambitions in the complex environment of urban area development. The research consists of theoretical research, presented in Chapter 2: Literature Review, and empirical research, presented in Chapter 4: Results. The research methodology is presented in figure 3.1

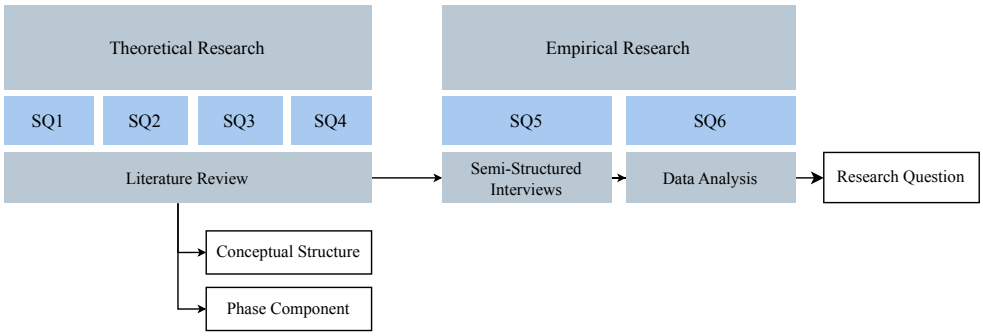

Figure 3.1: Research methodology

Theoretical Research

To answer the first four sub-questions, a literature review is conducted. The literature review is used to gather existing knowledge on key concepts, identify known challenges in theory and explore theoretical perspectives that help explain the complexity of the field. The literature study contributes directly to answering sub-questions 1, 2, 3 and 4:

- **Sub-Question 1**: The practice and background of urban area development are examined through literature, with a focus on understanding the factors that contribute to its complexity.
- **Sub-Question 2**: The existing challenges in realizing sustainable urban areas are explored and categorized.
- **Sub-Question 3**: To gain a deeper understanding of the complexity of urban area development, literature on transition theories is reviewed. This led to the identification of a theoretical perspective that is further applied in this study.
- **Sub-Question 4**: The selected theory is used to explore the roles and responsibilities of actors involved in urban area development through a focused literature review on actors and their responsibilities.

The literature review resulted in a conceptual structure based on categories of challenges and actor groups, and identified the phase component of the sustainable transformation theory as a useful lens for the empirical analysis.

Empirical Research

The literature review serves as input for the empirical data in multiple ways. First, it helps build an understanding of the topic, enabling more focused and in-depth conversations during the interviews. Second, it supports the selection of respondents by identifying relevant actor groups that can potentially have an influence in the realization of ambitions. Lastly, it offers frameworks to help categorize and interpret the empirical data.

Semi-structured interviews are used to gather the qualitative data. Semi-structured interviews combine the consistency of a pre-defined question set with the flexibility to explore new directions during the conversation. The structured component ensures that key topics are addressed across all interviews, while the open format allows for deeper exploration of specific themes and insights (Magaldi & Berler, 2020).

This flexible approach is particularly important in this study, as the respondents differ in their roles and perspectives. The diversity among participants requires space for open conversation and the ability to adapt the interview to each specific context. As such, while the interviews are guided by a prepared set of questions, they often resemble open interviews in practice, allowing unexpected but relevant topics to emerge. This combination of structure and flexibility is the key reason for choosing semi-structured interviews as the primary method of empirical data collection.

The empirical findings contribute to answering sub-question 5 and 6:

- **Sub-Question 5**: The interviews provide data on the challenges experienced by different actors in practice, broadening an deepening the challenges found in literature.
- **Sub-Question 6**: The analysis of the interview data with an analytical framework helps place these problems in a broader context, allowing for reflection on how transition theories can further explain the challenges.

The empirical data was collected through two rounds of interviews. The first round focused on actors directly involved in the urban area development process, specifically respondents from government and industry. The aim of this round was to identify the challenges encountered 'within' the system by those typically engaged in decision-making and implementation. These insights provided a foundation for the second round of interviews, which included actors from NGOs, financial institutes and knowledge institutions. These participants offered more external or reflective perspectives, allowing for a broader interpretation of the findings.

3.1.2. Selection Criteria

The selection of interview respondents is based on the following criteria:

- **Actor Group**: All five actor groups from the sustainable transformation theory were represented: Governments, Industry, NGOs, Financial Institutions, and Knowledge Institutes. The goal was to include at least three participants per actor group.
- **Relevant Expertise (Governments & Industry)**: Respondents from the government and industry groups were required to have experience with urban area development, specifically within urban areas in the Netherlands.
- **Relevant Expertise (Other Groups)**: For respondents from the NGOs, financial institutions, and knowledge institutes groups, direct experience within the process of urban development was not required. Instead, the aim was to explore whether they already play, or could potentially play, a role in area development. However, familiarity with the domain of urban development was still expected.
- **Experience**: A minimum of 10 years of professional experience was preferred. Exceptions were made in cases where respondents had significant expertise specifically related to sustainability in urban area development.
- **Involvement or Work Focus**: Within each of the five actor groups, respondents were selected to represent a variety of perspectives and roles. While all respondents shared a similar primary role within their actor group, they often fulfilled secondary roles that overlapped with other groups. The selection aimed to reflect diversity in focus areas within urban area development.
- **Company Size**: Variation in the size of the organizations was deliberately sought, as company size can influence financial capacity and the ability to engage in or support sustainable initiatives.

3.1.3. Interview Protocol

The interview protocol is intended to be a guide for the interviewer, ensuring a consistent and ethical approach throughout the data collection process. Two separate interview protocols are developed, corresponding to two rounds of interviews with different actor groups involved in urban area development, each contributing from a distinct perspective.

Interviews were conducted both online and in person and were recorded in the meeting room. Participants were first contacted via email, where the purpose of the research and its relevance to their expertise were clearly outlined. Prior to the interview, each participant received an informed consent form detailing the data collection procedures. This form can be found in Appendix C.

To protect the privacy of the participants, all responses are anonymized, and only their company names are mentioned. There are key topics that are considered to form the basis of the semi-structured interviews. However, semi-structured interviews are used to gain knowledge on practical experience but also information that is not expected beforehand. This flexible approach allows for deviation from the standard interview questions.

In addition, as the interviews progressed, new insights emerged that led to adjustments to the interview approach. This iterative process allowed the researcher to respond to new themes and refine the focus of subsequent conversations. Appendix A and B contain the final versions of the Dutch interview guides, which outline the structure and key themes addressed during the interviews.

The primary aim of both protocols was to identify the challenges actors encounter in realizing sustainability ambitions, as well as to explore the roles they see for themselves in overcoming these challenges. However, the interviews were designed to go beyond simply listing challenges. Each protocol focused on several in-depth thematic areas:

Protocol 1

This protocol was used in the first round of interviews, targeting actors who are directly involved in planning and decision-making. These are actors from governments and industry.

1. **Expertise**. This theme was included to verify the relevance of the respondents background and ensure they had experience with urban area development.
2. **Actors**. To contextualize the role of the respondents, questions explored how they perceive their own position related to other actors in the process.
3. **Challenges**. Respondents were asked to identify the main challenges they face in realizing sustainability ambitions. This section followed the actor theme to help respondents make direct connections between actors and the challenges they experience.
4. **Success factors**. Discussing enablers and success factors revealed underlying challenges for realizing ambitions. This offers a complementary angle to the challenges theme.

Protocol 2

The second round included stakeholders from NGOs, financial institutions and knowledge institutes, who often operate more indirect in the urban area development system.

1. **Expertise**. As with Protocol 1, this theme ensured that the interviewees had relevant expertise and were able to reflect on the topics.
2. **Collaborations**. Rather than focusing on individual actors, this round emphasized collaborations. The aim was to understand if and how these actors participate in development processes.
3. **Challenges**. Beyond identifying challenges, these respondents were asked to reflect on what role they see for themselves, or their sector, in addressing the challenges.
4. **Finance**. As financial constraints emerged as a recurring theme in the first round of interviews, this topic was explicitly added to explore how financial actors perceive their role in enabling or limiting sustainability ambitions.
5. **Success factors**. As in Protocol 1, this theme was used to uncover deeper insights and to highlight conditions that are perceived as critical to successful implementation of sustainability ambitions.

3.1.4. Respondents

A total of 24 interviews were conducted with respondents from the five actor groups of the sustainable transformation theory. These include governments (5), industry (7), NGOs (3), financial institutions (5) and knowledge institutes (4).

By ensuring coverage across all five groups and conducting a minimum of three interviews per group, the aim was to gather insight into a broad spectrum of challenges related to achieving sustainability ambitions within the urban area development system. Table 3.1 presents an overview of the interviewed respondents. For privacy reasons, only the code, group, subgroup and organization are listed.

The *Code* is used in the results section when referring to specific interview quotes. The *Group* indicates the respondents primary role based on the five actor groups. The *Sub group* provides a more detailed classification within these groups, as introduced in Section 2.4 and summarized in Table 2.2.

Code	Group	Sub group	Organization
G.1	Governments	Municipalities (Executive role)	Municipality of Purmerend
G.2	Governments	Municipalities (Executive role)	Municipality of Dordrecht
G.3	Governments	Municipalities (Executive role)	Municipality of Amsterdam
G.4	Governments	Municipalities (Regulatory role)	Municipality of Rotterdam
G.5	Governments	Municipalities (Financial role)	Municipality of Gooise Meren
I.1	Industry	Developers	BPD Bouwfonds Gebiedsontwikkeling
I.2	Industry	Developers	Zuiver Vastgoed
I.3	Industry	Housing Associations	Intermaris
I.4	Industry	Engineering and Consultancy	Arcadis
I.5	Industry	Engineering and Consultancy	Witteveen+Bos
I.6	Industry	Engineering and Consultancy	AT Osborne
I.7	Industry	Engineering and Consultancy	Metafoor Ruimtelijke Ontwikkeling B.V.
N.1	NGOs	Environmental Organizations	Natuurmonumenten
N.2	NGOs	Environmental Organizations	IVN Natuureducatie
N.3	NGOs	Environmental Organizations	Stichting Steenbreek
F.1	Financial Institutions	Banks	Rabobank
F.2	Financial Institutions	Insurers	MDO Verzekeringen
F.3	Financial Institutions	Insurers	Verbond van Verzekeraars
F.4	Financial Institutions	Property Investors	Heeneman & Partners
F.5	Financial Institution	Property Investors	Redevco
K.1	Knowledge Institutes	Academic Institutions	Erasmus University
K.2	Knowledge Institutes	Academic Institutions	Delft University of Technology
K.3	Knowledge Institutes	Academic Institutions	Delft University of Technology
K.4	Knowledge Institutes	Independent Research Institutes	The Netherlands Environmental Assessment Agency (PBL)

Table 3.1: List of interviewees

Although insurers were initially approached due to their role as institutional investors, it became clear that their function as non-life insurers (*Dutch: schadeverzekeraars*) in fact has a different direct impact on urban area development. For this reason, insurers are identified as a separate subgroup.

3.2. Method of Analysis

This section outlines the method of analysis used to interpret the qualitative data gathered through semi-structured interviews. The aim was to identify the challenges that different actors face in realizing sustainability ambitions and in fulfilling their intended roles. A second objective was to relate these challenges to broader system dynamics by using insights from transition theories, in order to gain a deeper understanding of the challenges. The results followed a structured reading approach and was conducted in two main parts.

Part 1: Identifying Actor-Specific Challenges

The first part of the results is about showing the challenges experienced by the respondents. First, all interviews were transcribed and thoroughly read to become familiar with the content. Relevant observations were not only extracted from direct answers to questions, but also from broader reflections shared throughout the interviews. For each transcript, key points were summarized under a number of recurring themes, including experienced challenges, perceived roles, forms of collaboration and business models.

Next, the interviews were reviewed per actor group to identify similarities and differences across respondents and the challenges found in theory. The conceptual structure developed in the literature review allowed for a deductive structuring approach and served as a foundation for organizing the results. In this structure, actor groups are distinguished, and challenges are categorized according to the categories introduced in Section 2.2: financial, policy and regulatory, and organizational. A deductive approach helps structure the analysis around issues that are already known to be important in the existing literature, enabling the researcher to approach the data through a focused lens (Gioia et al., 2013; Linneberg & Korsgaard, 2019). Using a focused lens was particularly useful in this study, as the interviews involved a diverse set of respondents with varying perspectives. Using a predefined structure made it possible to organize the variety of data and compare findings across actor groups.

These empirical results are described in detail in Section 4.1 to 4.5. To ensure no relevant insights were overlooked, all transcripts were re-read in their entirety.

Part 2: Linking Challenges to Transition Phases

The second part of the results interprets the empirical findings through the lens of the transformation phases described in paragraph 2.3.3 on the sustainable transformation theory. The goal of this step is to deepen the understanding of the complexity underlying the identified challenges. To apply this framework, the transformation responsibilities of each actor group were first studied in relation to the different phases (see Appendix D). Based on this, Section 4.1 to 4.5 were reread to identify statements that reflect the actor's current phase of engagement. In addition, all interviews were re-read in full to identify insights that might align with specific transformation phase responsibilities, which may have been previously overlooked during part one.

The focus lies on identifying indicators of how actors perceive their role, how they define challenges, how they depend on others, and how these elements align with the phase-specific roles described in the theory. This interpretive step results in five illustrative examples of actor dynamics in the system of urban area development. These are presented in Section 4.8.

Rather than placing each respondent in a specific phase, this study deliberately uses examples to show and understand the complexity of the challenges in the system. Many actors perform tasks from different phases at the same time, which made it impossible to assign actors to just one phase. The examples instead help to better understand how actors depend on each other and how misalignments between them affect the whole system.

Both parts of the analysis are supported by selected quotes from the interviews. These quotes were included to ground the analysis in empirical evidence and to illustrate how the results emerged from the own words of the respondents. Further implications of the findings are provided in the Discussion chapter (Chapter 5), where the results are placed in a broader context.

3.3. Ethical Considerations

All data collection in this research is entirely voluntary. Participants remain anonymous, and informed consent is obtained prior to their involvement (see Appendix C). Strict privacy protection measures were followed to protect the privacy and confidentiality of all respondents. This study adheres to the principles of ethical research conduct and has been approved by the TU Delft Human Research Ethics Committee (HREC).

4

Results

This chapter presents the results of the interviews, categorized per actor group. It aims to deepen the understanding of the challenges identified in literature, by exploring how they are experienced by different actors. Next, it aims to broaden the perspective by including additional viewpoints from a diverse range of actors. The findings provide insight into how various actors perceive their role and the challenges they experience in realizing sustainability ambitions. These challenges are categorized according to the three main types identified in Section 2.2, Table 2.1: financial, policy and regulatory, and organizational challenges. The results are first discussed per actor group. Section 4.6 offers an overview of the identified challenges placed in the conceptual structure. This is followed by a section on results related to cross-domain roles. The chapter concludes with an analysis of the findings with the phase component of the transformation theory in Section 4.8 to further explain the systemic complexity of the challenges.

4.1. Governments

Governments, and municipalities in particular, play a central role in urban area development. Primarily, municipalities fulfill a regulatory role. At the same time, due to their involvement in implementation processes, they act as executing parties (industry role), and as financial actors by investing in public space, infrastructure and social amenities (financial institution role).

To reflect this diverse role, interviews were conducted with municipal policymakers, executors and a representative from the financial department. However, their responses showed strong similarities. Therefore, the findings are presented jointly in this section.

4.1.1. Municipalities

Financial Challenges

Municipalities report a lack of financial resources to realize sustainability ambitions. They are often dependent on national government subsidies, which are either limited or declining. As one respondent put it: *"There are few subsidies"* (G.1), and another noted: *"We depend on the national government for subsidies"* (G.2). It was also mentioned that *"we receive less money from the national government"* (G.5), which, according to the respondent, leads to the weakening or scaling down of sustainability ambitions. When national funding decreases, municipalities are forced to allocate less money to urban area development.

The high costs associated with sustainability form a second challenge. *"Technically, anything is possible. Everything you ask for can be done, but it just costs extra"* (G.4). This shows that the challenge lies not in the availability of alternatives, but in their affordability. Sustainability is often perceived as an additional cost: *"Sustainability is simply an extra expense for us as a municipality"* (G.5). Moreover, as projects progress, financial considerations often lead to a scaling down of ambitions: *"After the initial principles are set, you see that sustainability ambitions often incur increasing costs and are then scaled down"* (G.4).

Another challenge is that costs and benefits do not always fall to the same actor. *"Costs and benefits are not borne by the same party"* (G.4), referring to split-incentives. Furthermore, financial uncertainty is seen as a risk: *"It's about risks. We're simply not used to it yet"* (G.3).

Figure 4.1 visualizes this financial challenge by showing a simplified representation of the financial involvement of municipalities. Section 2.1.3, Figure 2.1 served as the basis. The part where municipalities are financially involved has been highlighted red. Generally, municipalities are mainly involved in the land exploitation phase of financing, where costs of sustainability is presented. However, the revenue of sustainability measures typically materialize during the operational phase or even later, which lies beyond the red-highlighted section and benefits other parties.

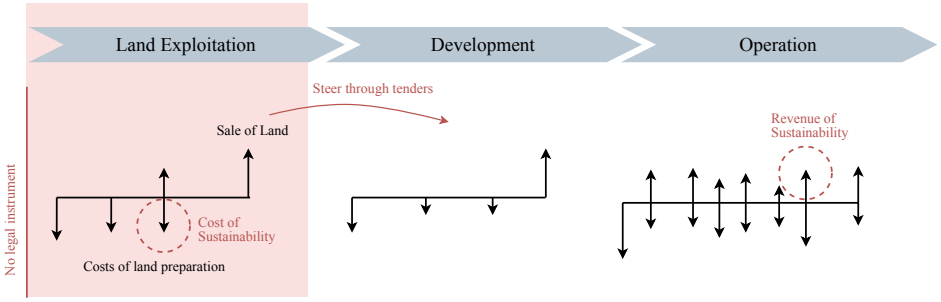

Figure 4.1: Financial involvement municipality

Policy and Regulatory Challenges

The most frequently mentioned obstacle is the lack of legal room to enforce ambitions that go beyond national regulations. *"Let me put it this way: in general, the biggest barrier is that policy is not yet aligned*

with the ability to realize ambitions that exceed legal requirements" (G.3). Municipalities indicate that they cannot always embed their sustainability ambitions in binding contractual terms, especially when they do not own the land.

There are two scenarios: when the municipality owns the land, it can steer through tenders; when it does not, it depends on developers. *"If the municipality owns the land, we issue tenders, then we can achieve a lot. In other cases, we have to persuade parties, and that's much more difficult"* (G.3).

Figure 4.1 also points to this challenge. If the municipality owns the land, it is responsible for land exploitation and it can steer the development phase. However, if the land is owned by private developers, they lack this legal steering instrument.

Municipal respondents indicate that developers often stick to the legal minimum: *"They simply adhere to the building code. They won't go beyond that"* (G.1), and *"Developers often fall back on what is legally required, preferably nothing more"* (G.2). The lack of binding legal instruments is therefore seen as a major reason why ambitions are not realized: *"In the end, if policy is not underpinned by legislation, it becomes much more difficult to implement"* (G.2). A structural solution is seen at the national level: *"Things need to be adjusted at the national level. Only then can real progress be made"* (G.4). Municipalities feel dependent on both higher levels of government and market actors. As one respondent put it: *"We can't do anything, we can only set frameworks"* (G.2).

Organizational Challenges

Internally, municipalities face challenges related to limited coordination between departments, which can result in conflicting policy goals. As one respondent put it: *"We have separate budgets for each theme"* (G.1), highlighting how siloed structures hinder integrated approaches. One example mentioned: *"Someone wrote in the policy that there must be a 20 meter ecological zone, which means you can't build housing there. But someone else created a policy stating that housing should be built on that same location"* (I.7).

A related issue is the gap between policy development and implementation. *"There's the age-old divide between policy-making and execution"* (G.2). Visions often include ambitious sustainability goals but remain vague or internally conflicting. As one municipal executor noted: *"Sustainability is mentioned, but not concretely, like we have to deliver 30 percent social housing, 40 percent mid-range, 30 percent free-market housing, and apply an average parking norm of 1.5"* (G.1). This suggests that policymakers do not always consider or understand what is required for practical implementation. The interviews indicate that this disconnect is partly due to a lack of operational knowledge or expertise within policy departments. This was the only notable difference observed between municipal regulators and executors.

Another organizational challenge within governments is the dominance of short-term, results-oriented thinking in political decision-making. Policy planning is often constrained by four-year political cycles, such as those set by coalition or budget frameworks. As one municipal respondent noted: *"Politically, we are sometimes still a bit too focused on short-term results"* (G.5). An industry respondent added: *"We all sometimes fall into the trap of short-term thinking. There's short-term political ambition, when a deputy suddenly wants to accelerate progress"* (I.1). This short-term orientation can hinder long-term investments.

Finally, a challenge mentioned is the limited use of lessons learned. As one municipal respondent said: *"We actually do far too little with the lessons we've learned"* (G.3). As a result, similar mistakes may be repeated and opportunities for improving practices remain unused.

4.2. Industry

While governments set ambitions, it is the industry that is responsible for their practical implementation. To reflect the diversity of this category, interviews were conducted with different subtypes of industry actors, including developers, engineering and consultancy firms and housing associations. Given the variation in responses across different actor subgroups, the results are presented separately for each group. This variation in answers can be explained by the multiple roles these actors fulfill. For example, developers also act as financial institutions, housing associations also operate as NGOs and financial institutions, and engineering firms also have a role as knowledge institutes, as explained in Section 2.4.

4.2.1. Developers

Financial Challenges

Developers highlight the high costs of sustainability and how it often does not fit their business model. Their revenue model is tied to the moment real estate is sold: *"We only make money when the house is sold. That's essentially how sustainability ambitions are paid for"* (I.1). This reliance on sale-based income means that sustainability investments must fit within a viable financial plan. As one respondent put it: *"You have to make sure enough money comes in to maintain a balanced financial position"* (I.1). This financial perspective is also acknowledged by government actors. One noted: *"They do understand the urgency, but their financial models must add up"* (G.4), while another observed: *"Traditional developers are still primarily focused on delivering returns"* (G.3).

The financial involvement of developers is shown in simplified form in Figure 4.2, based on the broader financing model shown in Section 2.1.3, Figure 2.1. The section relevant to the developer has been highlighted in red and adapted to reflect the role of this actor. There are two scenarios. When the developer does not own the land, it is primarily responsible for the development component of the financial model (1.). However, a key element of a developer's business model, as emphasized by several respondents, is the increase in land value resulting from zoning changes in the land-use plan. Therefore, developers often own the land and are involved in the land exploitation (2.). This added value is only financially realized at the moment the real estate is sold. The time span between land preparation and the eventual sale of real estate can vary significantly. According to respondent I.2, the development process typically takes between three and ten years.

The figure provides insight into the financial challenges experienced by the respondents, that are related to their business model. When construction costs rise due to sustainability measures, these additional costs must still fit within the margins created by the land value increase and the eventual sale of real estate leading to a financial feasible plan.

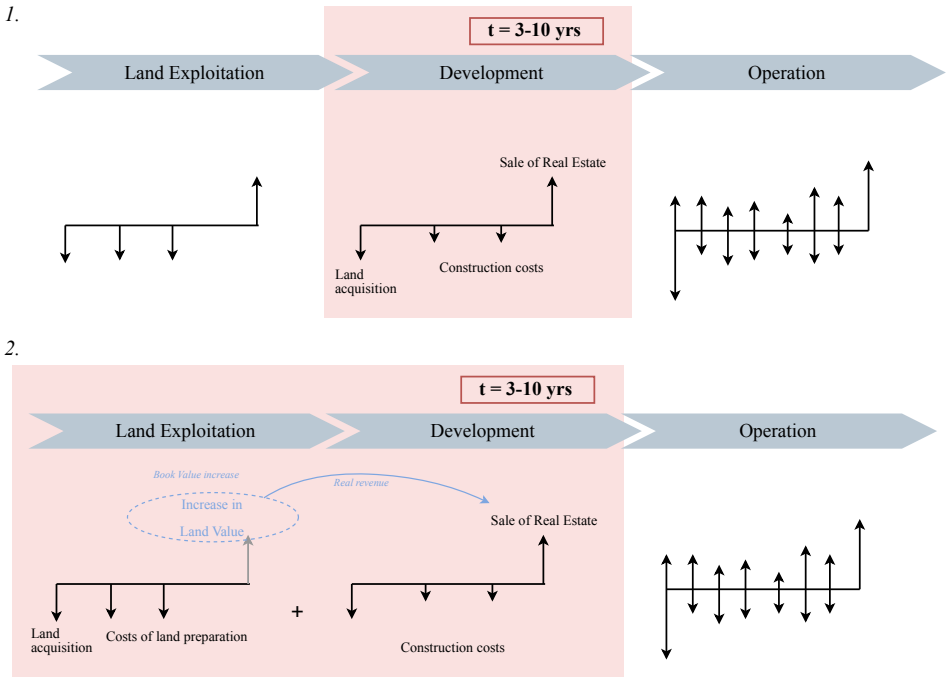

Figure 4.2: Financial involvement developer

Policy and Regulatory Challenges

A major perceived challenge for developers is the stacking of sustainability requirements, often coming from various government levels. As one respondent noted: *"There's a stacking of policies coming from all corners of the municipality"* (I.1). When resources are limited, certain ambitions are dropped: *"Then it might be a sustainability ambition that gets left out"* (I.1). Developers stress the need to prioritize between ambitions: *"We also need a profitable plan. That means making the right choices together about what takes priority"* (I.1) and *"Different authorities impose different and sometimes conflicting sustainability requirements"* (I.2). When the ambitions are not in conflict, the challenge is not the ambitions themselves, but the financial limitations that make it impossible to fulfill all of them. This highlights how policy and financial challenges are closely interconnected.

Organizational Challenges

No specific internal organizational challenges were mentioned in the interviews. However, the challenges categorized in the financial, and policy and regulatory challenges can be linked to the way that the actors are organized. It is the way the business model of the developers is organized, by their short-term business model, that leads to financial challenges. Also, the way that the governments are organized leads to a stacking of policies. This shows that financial, policy, and organizational challenges are interlinked.

4.2.2. Housing Associations

Financial Challenges

Housing associations emphasize that sustainability increases the base cost of housing construction. As one respondent put it: *"Sustainability does not make the cost price of a home cheaper. These measures are expensive"* (I.3). While they are willing to accept lower financial returns compared to commercial developers, they still need to maintain a sound financial plan. This creates a tension between providing societal value and staying financially viable.

One of the main challenges mentioned is the conflict between the cost price of sustainable measures and the maximum rent levels. This makes it difficult to make sustainable projects financially feasible:

"The real issue lies in the business model: the stacking of sustainability ambitions and requirements versus the need to keep rent affordable" (I.3).

Furthermore, housing associations noted that societal benefits, such as reduced illness and stress through greener environments, are not accounted for in current financial models. *"We know the societal benefits of green environments, less illness, less stress, but they are not priced in. Our models don't account for that"* (I.3). They do take a long-term view, but mostly from the perspective of building operation and maintenance, not broader social impacts.

Figure 4.3 visualizes these financial challenges by showing a simplified representation of the financial model of housing associations. This model is again based on Figure 2.1, with the section relevant to housing associations highlighted in red. Although some housing associations are involved in land exploitation and development, these are excluded here. The land exploitation phase is excluded because housing associations typically do not speculate on land value or sell assets for profit. Instead, their income comes during the operation phase, through long-term rental streams. When housing associations develop projects themselves, the cost of real estate, which occurs at the start of the operation phase, shifts to construction costs in the development phase.

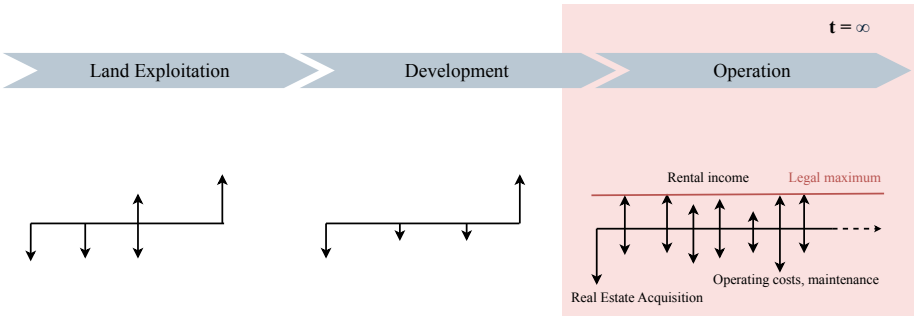

Figure 4.3: Financial involvement housing association

Policy and Regulatory Challenges

The key regulatory challenge is the maximum rent level, as shown in Figure 4.3. Another issue is the stacking of requirements, where sustainability ambitions from different levels are set, such as municipal policy, national targets and internal agreements: *"There are tensions caused by the stacking of requirements, coming not only from the municipality, but also from within our own organization"* (I.3). This creates pressure on the feasibility of projects. Just as for the developers, when the ambitions are not in conflict, the challenge is not the ambitions themselves, but the financial limitations that make it impossible to fulfill all of them.

Organizational Challenges

No specific internal organizational challenges were mentioned in the interview. However, similar to developers, the financial and policy related challenges appear to come from deeper organizational structures.

4.2.3. Engineering and Consultancy Firms

Financial Challenges

Engineering and consultancy firms frequently mention that financial barriers and risk perceptions among other actors hinder the realization of sustainability ambitions. As one respondent noted: *"The main issue is the costs. I often see high ambitions not being realized, simply because they come with higher expenses."* (I.5). Another added: *"It's really the lack of financial resources. That's where many of these ambitions get stuck."* (I.6).

A key problem is that the benefits of sustainability fall outside the financial scope: *"The time horizon usually ends at project delivery, while many of the financial and non-financial benefits come later."* (I.7).

This misalignment means that costs and benefits are not carried by the same party: *"The biggest issue is that the person who pays is not the one who benefits."* (I.6). However, some sustainable ambitions, such as those related to energy, are already financially viable in the short term, therefore more often implemented by market parties.

Unlike developers and housing associations, engineering and consultancy firms do not generate income through land or property. Their revenue model is based on time, expertise and capacity. They are service providers whose business model depends on project-based commissions.

Policy and Regulatory Challenges

Respondents mentioned that it is often impossible to include all sustainability ambitions in a project, because ambitions conflict with each other: *"You can't include all the ambitions; you have to choose"* (I.5). There are also problems caused by different policies from different government levels that do not always align or lack clarity, which further complicates implementation.

Organizational Challenges

Multiple respondents said that municipalities often have a lack of knowledge or capacity to make the right choices: *"It's normal that a municipality doesn't know all about sustainable options when starting a project"* (I.4), and *"There's not enough knowledge and capacity to make good decisions"* (I.5). Some also criticized the disconnect between political ambitions and operational feasibility: *"Politics is good at setting big ambitions, but they don't always think through the consequences"* (I.6), linking back to the lack of operational knowledge.

Another mentioned issue is the lack of coordination within governments. *"If you want to innovate within a municipality, it has to go through many committees. Everyone has a say, and it often gets stuck at one department that raises objections"* (I.5). In addition, respondents observed that there is limited learning across projects or departments. Lessons learned are not always shared, which slows down progress and repeated mistakes.

While the respondents mainly reflect on the challenges faced by others, they also see limits in their own role. They have limited agency as they depend on their clients: *"We also have commercial interests. Our work is always based on the client's request"* (I.5), and *"Who pays, decides"* (I.4). This means they can advise, but the client decides what happens in the end.

Despite these challenges, engineering and consultancy firms recognize their important role in sharing knowledge and starting sustainability initiatives. Learning from experiences in multiple projects, they see themselves as key enablers for spreading knowledge in the system.

4.3. NGOs

For this research, three environmental organizations were interviewed in which nature in urban areas plays a central role. This choice has been made as it is expected that they are most concerned with sustainability ambitions. The respondents see a role for themselves as NGOs as contributing partners to promote sustainability in urban area development. Rather than taking an activating role, they aim to provide knowledge and guidance in the process. However, they encounter challenges in fulfilling this role.

4.3.1. Environmental Organizations

Financial challenges

According to the respondents, money is generally not the main problem. As one interviewee stated: *"There is often enough money to invest in nature. That is not the problem"* (N.1) and *"When municipalities say it's not possible or that there is no money, it just means they are poorly informed"* (N.2).

However, an issue is mentioned about the budget that is reserved for developments and the way these are divided: *"In many municipalities, work is done in silos. The road construction department spends the budget, and there is barely anything left for green spaces"* (N.2). For this reason, some NGOs prefer not to be involved in area development projects, because then they are bound to the development budget.

Policy and Regulatory Challenges

No explicit regulatory challenges were mentioned in the interviews.

Organizational Challenges

The most frequently mentioned challenge by NGOs is the fragmentation of responsibilities within local government. Different aldermen are responsible for housing, water, nature and recreation, which makes integrated planning difficult. *"We are not against building homes. But if there is a plan from one alderman to build houses and we want to share our knowledge to make sure it also supports biodiversity or avoids water overuse, it becomes complicated because another alderman is responsible for nature"* (N.1).

A second challenge is related to capacity. NGOs sometimes do not manage more green areas because they lack the people or resources to do so.

A third challenge concerns limited agency. *"The party that brings in the most money gets to decide what the final result looks like. That's one reason we're often not involved in projects, I have had too many negative experiences with that"* (N.2). This frustration is also mentioned by others, not only because of the lack of influence, but also because NGOs are sometimes used as a form of symbolic legitimacy without real involvement. *"It cannot be that an organization representing nature is used to justify an area development project that actually harms nature"* (N.3). Some NGOs therefore choose not to participate at all, while others stress that they would like to be involved, but only if this happens early enough in the process to have a real say. *"At the front end, you can truly contribute. Now it's often at the back end, and then we're used as a stamp of approval: 'look, even the green party supports this'. That's why we remain cautious"* (N.3). This lack of early involvement is also recognized by other actors. When asked whether NGOs typically play a role in area development, one governmental respondent stated: *"Oh, no, not at all"* (G.3). A former area development consultant similarly confirmed: *"In the urban development projects I was involved in, I've never encountered them. Maybe the ANWB or Fietsersbond, but not organizations focused on sustainability or nature."*

Finally, collaboration with commercial actors is seen as challenging. *"We try to stay out of dealings with private companies. It takes an incredible amount of energy to get them to change. Everything has to fit within their financial logic"* (N.2). Rather than pushing unwilling actors, some NGOs prefer to work with parties that are already open to collaboration: *"If you don't want to join, then you just don't"* (N.2).

4.4. Financial Institutions

Various interviewees from governments and industry actor groups emphasized the importance of financial institutions in urban area development in overcoming the financial challenges to achieving sustainable ambitions. As one municipal respondent noted: *"I believe there is a powerful force here that is slowly beginning to gain momentum."* (G.4) Another respondent said: *"Unlike others, financial institutions do recognize the long-term benefits of sustainability"* (I.6).

Different types of financial institutions, as identified in the literature, were included in the interviews. These are banks, property investors (managing capital for private clients or those working for institutional investors) and institutional investors. Although no institutional investors were interviewed directly, relevant insights were obtained from a property investor with experience working with and on behalf of institutional investors. The limitations of this indirect perspective are addressed in the research limitations section.

Insurers were initially approached due to their role as institutional investors. However, it became clear that they have multiple roles in urban area development: as institutional investors, providers of non-life insurance and mortgage lenders. Section 4.4.2, focuses on the latter two.

In addition to interviewees from governments and industry actor groups, financial institution actors also see a role for themselves in contributing to achieving sustainable ambitions in urban area developments. Banks view their role as one of setting frameworks and providing incentives. Insurers see themselves as playing a key role in sharing knowledge and risks, issuing early warnings and facilitating recovery after damage. Institutional investors position themselves through impact investing, in which they actively seek to generate measurable, positive social and environmental outcomes alongside financial returns.

While financial institutions are seen, both by others and by themselves, as part of the solution, they also face a variety of challenges in practice. These challenges are discussed per subgroup in the paragraphs below.

4.4.1. Banks

Financial Challenges

Banks provide loans for developers, typically for the construction. After project completion, the developer sells the property and repays the loan, at which point the bank exits the development. This is represented in Figure 4.4. Their revenue model is based on providing loans with interest.

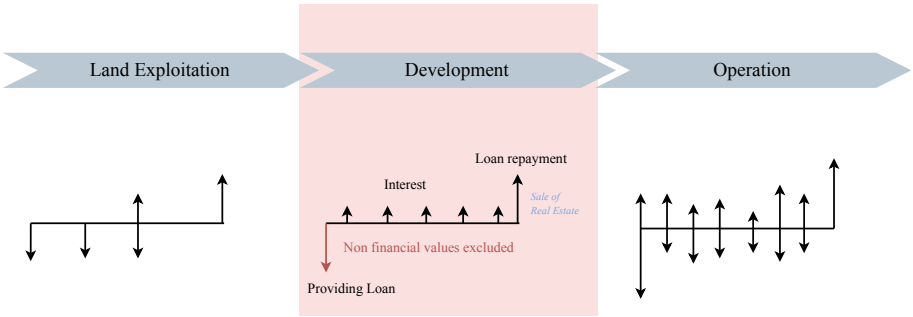

Figure 4.4: Financial involvement bank

Lack of capital is not a problem for banks. The real issue arises when values cannot be translated into financial terms. As one respondent explained: *"When we cannot express the positive impact of something in financial terms, it becomes difficult to incorporate it into project development, especially if it costs money. If we manage to make the financial impact visible, it helps us as a bank to steer and increase our contribution."* (F.1). Although the respondent emphasized that a sustainable measure does not necessarily need to have financial returns to be valuable, the financial logic of the bank requires precisely that. In practice, non-financial values are much harder to integrate into decision-making.

Policy and Regulatory Challenges

Banks also face challenges when applying stricter rules. At the moment, they already set clear requirements for energy labels. However, one respondent noted: *"If we impose more rules and make too many demands, our clients will go to other financiers"* (F.1). Banks are hesitant about setting stricter conditions, because they don't want to lose a large part of their clients. *"Even if we could measure more, I don't think we would be willing to say goodbye to three-quarters of our clients"* (F.1).

Organizational Challenges

The primary internal challenge for banks lies in the inability to steer based on non-measurable or non-financial sustainability values. While banks aim to support biodiversity, circularity or social sustainability, they lack the tools, data, and frameworks to act on this. The key issue here is the lack of measurable financial benchmarks that would allow these values to be included in investment decisions.

Banks distinguish between types of sustainability ambitions. Some, such as energy performance, can be clearly measured and are therefore actively used in criteria for loans. *"Energy can be measured well, so we can require it from clients via energy labels"* (F.1). Other ambitions, like bio-diversity, nature-inclusive design or circular construction, are much harder to quantify. As a result, banks currently rely on informal means, such as knowledge sharing or using their network to raise awareness. *"We currently don't have a strong lever for those. We're quite strict when it comes to energy labels, and I hope we'll get to that level with other aspects of sustainability as well, but we're not there yet"* (F.1).

4.4.2. Insurers

Financial Challenges

There is currently no immediate financial issue for insurers. Nevertheless, insurers increasingly warn about long-term financial risks. An important insight from the interviews is that different sustainability themes affect insurers' risk assessments in different ways. For example, energy-related measures can increase the risk of damage (e.g. fire), which leads to higher insurance premiums. These risks are already accounted for. However, other sustainability themes, such as climate adaptation or biodiversity, are not yet included in risk assessments.

With a long-term perspective, real estate could become uninsurable due to high risks of water and climate-related damage. This is already happening in countries like Australia and the United States. If buildings can no longer be insured, mortgages can no longer be issued, which may ultimately lead to housing becoming inaccessible or unaffordable: *"If we don't take climate-adaptive measures in time, real estate will no longer be insurable because the risk of damage is too high"* (F.3).

This reflects a shift in risk perception. From sustainable measures being seen as a short-term cost or risk, to the lack of such measures becoming a long-term risk. In this view, not investing in sustainability may lead to even greater financial consequences.

Policy and Regulatory Challenges

According to a respondent, the main challenge lies in the lack of legal instruments. While many municipalities have issued sustainability guidelines, legal enforcement remains fragmented and inconsistent. As one respondent stated: *"Right now we have all these fragmented municipal rules, but what we need is a clear national policy."* (F.3). Respondents also noted that insurers cannot enforce requirements that go beyond law: *"The current coalition is reluctant to strengthen building regulations, and our own standards can't go further than what's required by law."* (F.3).

Organizational Challenges

Insurers face a lack of long-term data for risks related to climate adaptation, biodiversity or other sustainable ambitions. Their current risk assessments are still largely based on historical data and direct damage, rather than forward-looking climate scenarios.

Another issue is that insurers are not structurally involved in development projects. Although this is starting to change, their involvement still comes late in the process. *"We're usually only brought in when the project is close to completion. We only appear near the end of the process."* (F.2). As a result, the expertise insurers have on long-term risks is not integrated into the early stages of planning and design.

4.4.3. Institutional Investors

Financial Challenges

A frequently heard statement is that the challenge is not the availability of money. *"There is a tremendous amount of money circulating in the pension sector. The Dutch pension system is the sixth largest in the world"* (F.5).

However, the real challenge lies in risk. As one interviewee explained: *"Institutional investors want limited risk; they must comply with regulation, but they also have to ensure pension payouts. So they won't invest in anything with too much volatility"* (F.5). The respondent added: *"They only invest in scalable products with as little risk as possible"* (F.5). This challenge is supported by literature, which notes that investments in real estate and especially in area development typically involve high risk profiles (Heurkens et al., 2020), which makes them unattractive for institutional capital.

Policy and Regulatory Challenges

Policy and regulation is not seen as challenge, but as enabler. ESG-related regulations from the European Union, are increasing the pressure on institutional investors to align their portfolios with societal goals. As a result, many institutional investors are looking for more sustainable and impactful investment opportunities.

Organizational Challenges

Institutional investors have a growing interest for investing their capital in areas to make impact. However, these actors face organizational challenges in doing so. One is the lack of knowledge and tools to evaluate and manage impact. While there is experience with energy and carbon related metrics, expertise around social impact is limited. As one respondent stated: *"There's a real lack of knowledge about how to generate and measure positive impact"* (F.5). However, there is growing awareness that social and environmental value can positively affect long-term financial performance. An example given by the respondent is, when tenants feel good in a building, they are more likely to stay longer. Reduced turnover lowers vacancy periods and re-letting costs, and may also reduce maintenance. In addition, happier tenants are often better able to meet their financial obligations, which benefits the income stability of the asset.

Finally, a key challenge is the lack of suitable investment products. While institutional investors are increasingly willing to allocate capital for impact, they report difficulties in finding appropriate opportunities: *"The number of impact investment products is too limited to meet the demand"* (F.5). In particular, within the field of real assets, such as land, real estate, water and infrastructure, there is a limited availability of direct investment products that combine meaningful impact with acceptable risk-return profiles. However, some parties are currently piloting real asset investment portfolios, which could enable institutional investors to engage in long-term investments in urban areas.

4.4.4. Property Investors

Financial Challenges

Although investors tend to take a longer-term view than developers, financial returns are still distributed quarterly (this can differ per investors), as illustrated in the simplified business model in Figure 4.5. This short payout cycle in their business model limits long-term thinking. The key issue is that investors must deliver returns to their clients: *"Our clients just want to see the return on their account, then they're fine with everything."* (F.4). The main perceived challenge to sustainable measures is that it often does not generate immediate financial return. *"Sustainability in real estate means accepting lower returns as an investor."* (F.4). *"Because it simply costs more money to do things sustainably."* (F.4). The central financial challenge is therefore the combination of high upfront costs and the need for short-term returns. This is also seen among investors who manage institutional capital: *"There is a mindset where the focus on returns often dominates."* (F.5) and *" The investment horizon is becoming shorter because the focus is shifting even more toward returns."* (F.5).

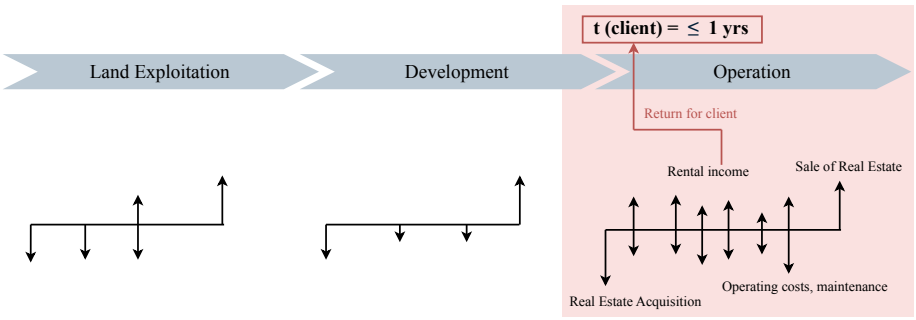

Figure 4.5: Financial involvement property investor

Another financial challenge mentioned is the issue of split incentives. The financial benefits of sustainability, such as energy savings, are typically felt by the tenant, while the investor bears the cost: *"The investor makes the big investment, but it's the tenant who benefits."* (F.4).

Policy and Regulatory Challenges

Investors do assess energy labels, but other sustainability themes are not considered unless legally required or financially proven. Government regulation is seen as a strong influence. For instance, the requirement for office buildings to meet energy label C: *"When something is legally required, that helps."* (F.4). However, if the rules become too strict, this can create problems. Both governments and financial institutions can set requirements, but investors warn that if the demands are too high, clients may turn to foreign banks instead.

Organizational Challenges

If investors decide to invest in sustainability, this often increases costs and lowers returns leading to the risk of losing clients. Clients may choose to move their money to another investor who offers higher returns: *"In my experience, they just go to someone else who gives them that higher return."* (F.4). While similar concerns were raised by banks in relation to regulations, this is considered an organizational challenge here because it reflects how the business case of an investor is structured and how they are tied to short-term client expectations.

Another challenge is the late involvement of investors in the development process. Their perspective is often not included at the start of projects, which limits their ability to influence decision-making.

4.5. Knowledge Institutes

Both academic institutions and independent research institutes were interviewed. Given the overlap in their responses, the results are presented together in this section. The interviews focused on their role as researchers, the challenges they face themselves and the obstacles they observe in the broader system of sustainable urban development. Knowledge institutes see a role for themselves as connecting actors, capable of maintaining neutrality, providing depth, articulating underlying questions and conducting research to make sustainability measurable. However, they too encounter challenges in fulfilling this role and enabling sustainability ambitions.

4.5.1. Academic Institutions and Independent Research Institutes

Financial Challenges

Financial challenges were not mentioned. Respondents indicated that they mainly observe structural challenges within the system itself, such as how processes are organized and how performance is evaluated, rather than facing financial constraints.

Policy and Regulatory Challenges

There is a lack of a clear vision within policy and decision-making. One respondent illustrated this with an example from the mobility domain: *"We are currently managing the transition from petrol to electric cars, but maybe we should be managing the transition from car use altogether to public transport, walking, or cycling"* (K.1). A clear direction is seen as important. Once it is known where we want to go, policies and research can be focused to support that goal.

Organizational Challenges

Most challenges experienced by knowledge institutes are organizational challenges. Academic researchers pointed to the current reward structure within universities as a key challenge. Practice-oriented work, such as collaborations with municipalities, often does not result in publishable academic outputs, making it less attractive to researchers. One respondent stated: *"It has a lot to do with the shift from traditional academic evaluation, which focuses on counting publications, to more appreciation of contributions to society"* (K.1). Another added: *"You could say the university system itself is also in transition"* (K.3). For a long time, the focus has been on producing international publications, but there is growing awareness that scientific knowledge should also reach societal stakeholders.

Another challenge is the lack of involvement of knowledge institutes in urban development projects. When involved, they are often brought in too late to influence key decisions: *"It's important to involve universities at the right moment, because now you often see that many decisions have already been made before we are consulted, or research is only requested after something has gone wrong"* (K.1) This lack of involvement is also mentioned by actors from municipalities and the industry: *"Knowledge institutes do not play a role in the projects I have worked on"* (I.5).

Independent research institutes also highlighted their limited agency and pointed out that they are not in decision-making roles. *"We are not policymakers. We only provide knowledge to them"* (K.4). This restricts their ability to steer sustainable outcomes, even when their advice is requested.

Another challenge is that research is often focused on the short term. According to one respondent, this is part of a broader issue that explains why ambitions in sustainable development are often not met: *"There is a common reason why things don't work out, we tend to look at the short term"* (K.4). For example, spatial studies often look ahead to 2050, while climate change requires a much longer perspective. This creates a mismatch between the lifespan of developments and the planning horizon. *"It is strange that a new residential area is expected to last at least 40 years, but our planning often stops at 2050. That is only 25 years from now"* (K.4).

Besides the challenges that knowledge institutes face themselves, they also see bigger problems in the system. One recurring concern is the dominant focus on fixed definitions and measurable outcomes: *"The problem is that we want fixed definitions and rules, but in real life, things are always changing"* (K.3). As a result, some aspects, such as the ecological dimension, are increasingly addressed, the social dimension, remain overlooked due to its limited measurability. While acknowledging that not everything should be quantified, one respondent emphasized the role of knowledge institutes in addressing this gap: *"Our role is to help make that social side easier to measure"* (K.2).

4.6. Overview Challenges

Figure 4.6 provides an overview of the key challenges identified during the interviews. These are categorized according to the conceptual structure developed in the literature review, which distinguishes between actor groups (as described in Section 2.4) and three main types of challenges (as introduced in Section 2.2). A larger version can be found in Appendix E.

Actor Group	**Governments**	**Industry**			**NGOs**	**Financial Institution**				**Knowledge Institutes**
Sub Group	***Municipalities***	***Developers***	***Housing Associations***	***Engineering and Consultancy***	***Environmental Organizations***	***Banks***	***Insurers***	***Institutional investors***	***Property investors***	***Academic Institutions / Research Institutes***
Financial	Lack of financial resources: dependent on national government	High costs	High costs	High costs	Low budget reserved for urban area developments	Financial logic does not incorporate non-financial value	Long-term financial risks of damage	Financial risks	High upfront costs	
	High additional costs	Business model limitations: Reliance on short-term sale-based income	Tension between societal value and financial viability	Lack of financial resources			Shift in risk perception		Short payout cycle limits long-term investment	
	Financial uncertainty		Business model limitations	Risk perception among other actors					Split-incentives between investor and tenant	
	Split-incentives			Split-incentives						
Policy and regulatory	Lack of binding legal instruments	Stacking of requirements	Maximum rent levels	Conflicting requirements		Risk of client loss due to more regulations	Lack of legal instruments			Lack of clear policy vision
	Conflicting policy goals	Conflicting requirements	Stacking of policies and ambitions	Lack of clarity in policies and vision			Fragmented rules			
	Vague goals									
Organizational	Limited coordination between departments			Limited agency	Fragmentation of responsibilities within local government	Lack of measurable financial benchmarks	Lack of long-term data for changing risk perception	Lack of knowledge on evaluating impact	Risk of client loss	Misaligned academic reward system
	Lack of operational knowledge			Lack of operational knowledge among other actors	Lack of capacity		Lack of involvement in development processes	Lack of measurable financial benchmarks	Lack of (early) involvement in development processes	Lack of (early) involvement in development processes
	Lack of expertise			Lack of capacity among other actors	Solely used as a form of legitimacy			Lack of suitable investment products		Limited agency
	Short-term political cycles			Lack of coordination within governments	Limited agency					Short-term research focus
	Limited use of lessons learned			Limited learning across projects	Lack of early involvement					Limited measurability while focused on fixed definitions
					Difficult collaboration with commercial actors					

Figure 4.6: Interview results overview (Larger version in Appendix E)

The figure presents the challenges encountered by interviewees in pursuing sustainability ambitions within urban area development, as well as the challenges they face in fulfilling their roles in contributing to these ambitions. It illustrates the large number of challenges that emerge when the perspective is expanded to include a wider range of actors. The figure is not exhaustive, as additional interviews may further expand and refine the table.

All challenges mentioned in the interviews can be grouped under the three categories identified in the literature review. The challenges from literature are largely confirmed by the interviewees, especially those representing government and industry. Thereby, the interviews have served as a validation of the literature findings. However, the results reveals deeper insights into these challenges and offers a broader understanding of the system, by showing that other actor groups face different types of challenges.

One example is the challenge of short-termism. While this is was treated as a financial challenge in the literature, the interviews show that this challenge differs per actor group. Developers experience it in the form of short-term and sale-based business models, municipalities are constrained by short-term political cycles, and research institutes face short-termism in their research focus.

Another observation in Figure 4.6 is that actors from governments and industry actor groups often mention the same key issues: high costs and stacking or conflicting policy requirements. These issues are rarely mentioned by actors from outside these groups. In fact, respondents from NGOs, financial institutions and knowledge institutes explicitly stated that costs are not a concern, with some even saying that there is more than enough money available. Also, one NGO respondent mentioned that they are able to link different issues and goals, as they take a broader view that goes beyond individual projects, which could help in the challenge of stacking or conflicting ambitions.

This difference in perceived challenges among actor groups can be explained by the fact that both government and industry actors are directly involved in decision-making processes early in the devel-

opment. As a result, they are more deeply embedded in the practices and structures of the urban area development system. These findings align with the sustainable transformation theory, which assumes that actors operating within the same system are often locked into the same practices and therefore face the same challenges. To overcome these challenges, the involvement of other actor groups is necessary.

However, Figure 4.6 reveals that these actors face the challenge of a lack of (early) involvement in the development process. Respondents from NGOs, financial institutions, and knowledge institutes all mentioned this issue. As a result, the actors who do not experience the dominant challenges faced by governments and industry, and who may be able to help address them, do not have the opportunity to raise their perspectives during the early phases, such as the initiation phase. Yet this is precisely the phase in which ambitions are defined. Moreover, both NGOs and knowledge institutes reported experiencing limited agency even when they are involved, which further constrains their influence on the process.

At the same time, Figure 4.6 makes clear that early involvement of these actors is not a straightforward solution. The data shows that when these actors are involved, other challenges emerge. For example, institutional investors consider the risk of current investment products too high and therefore choose not to be involved, knowledge institutes are not rewarded for practical engagement under the academic system, insurers face difficulties in accessing long-term data required to assess shifts in risk perception, and NGOs sometimes prefer to act from outside projects to maintain autonomy or access more financial resources. In addition, many other challenges are experienced across all actor groups, further illustrating the complexity of the system.

These findings show the large amount of challenges faced by different actors in enabling sustainability ambitions in urban area development. To explore how the individual roles and challenges relate to one another and interact within the broader system, the phase component of the sustainable transformation theory is used as an analytical lens to the results in Section 4.8. First, Section 4.7, presents the results of the cross-domain actor roles.

4.7. Cross-Domain Roles

While the previous section focused on the challenges actors experience in enabling sustainability ambitions and fulfilling their roles, the interviews also offered a complementary perspective on actor roles. Specifically, they provided insights that confirm, and in some cases extend, the cross-domain responsibilities identified in the literature.

In the literature review, Section 2.4 presented an overview of the primary roles of actors in urban area development, based on the sustainable transformation theory. Table 2.2 showed that many actors have responsibilities that extend beyond their primary classification. The interviews confirm this complexity and, in some cases, provide additional insights.

In general, respondents recognize the categorization of actors based on their primary role, as shown during the first round of interviews. However, they emphasize that actual responsibilities in practice often transcend these boundaries. This confirms the existence of secondary and even tertiary roles.

In line with Table 2.2, governments, are not only seen as regulatory actors, but also as initiators and financial parties: *"They also have a financial role, because they provide subsidies"* (I.5).

Engineering and consultancy firms are acknowledged for their role in providing knowledge and conducting research for a project: *"Engineering firms, research agencies, and universities, they provide the knowledge on what you should do to achieve certain sustainability ambitions effectively and efficiently"* (I.6). At the same time, they see themselves mainly as industry actor: *"We have a commercial interest, in the end"* (I.5). As such, this actor fulfills roles of the industry and knowledge institute group.

Respondents have different perceptions of the role of housing associations. Although they are categorized as industry actors in their primary role, and are often compared to developers by other respondents, housing associations identify themselves as societal organization: *"Yes, I see a housing association as a societal organization. That's how I view it. I don't see it as industry"* (I.3). At the same time, other actors describe housing associations as financial institution, for instance when they act as clients for developers: *"You could see housing associations as financial institution, but I'm curious how others view that"* (I.6). This variety in perception confirms the primary (Industry), secondary (NGO) and tertiary (Financial Institution) roles of housing associations.

In addition to what is presented in Table 2.2, the interviews revealed further insights, concerning the role of banks. While categorized as financial institution in the literature review, and perceived as such by other actors, they themselves view their role differently. Banks see an important part of their contribution as setting frameworks and providing incentives, which aligns more closely with the responsibilities typically associated with governments. This suggests that their influence extends beyond the financial institution group into a secondary role of governments.

Lastly, insurers mentioned that their role extends beyond that of institutional investors, and thus beyond their classification as financial institutions. They see an important role for themselves as industry actors by delivering products and services. For instance, by supporting products that support climate-resilient recovery or by offering insurance solutions that incentivize climate adaptation: *"They can also stimulate innovation through their products, for instance by offering premium discounts when climate adaptation measures have been implemented"* (F.3).

In summary, the interviews confirm the overlapping responsibilities of actors as presented in theory, while also adding to it by highlighting the government role of banks and the industry role of insurers.

4.8. Phase Analysis

Section 4.1 to 4.6 has shown the large number of challenges related to specific actor types involved in realizing ambitions in urban area development, reflecting the complexity of the system. This section builds on that understanding by further unpacking the nature of this complexity. By analyzing the results through the lens of sustainable transformation theory, the challenges are placed in a broader systemic context, aiming to understand the interrelated complexity of the challenges and the actors. For this analysis, the transformation phases described in Section 2.3.3 and the roles and responsibilities per actor group, shown in Appendix D, are used.

According to the theoretical framework, every transformation of a complex system unfolds through four distinct phases: **inception**, **competitive advantage**, **synergy** and **institutionalization**. Each phase entails specific responsibilities for different actor groups, offering insight into their expected contributions throughout the process.

While many respondents express a willingness to realize sustainability ambitions and see a role for themselves in doing so, they face different challenges that hinder them. By analyzing these roles and challenges through the lens of the sustainable transformation theory, this section reveals that some actors are held back because other actors are still in earlier phases of the transition process. In this sense, the challenges are not isolated, but part of an interconnected system where progress in one area often depends on progress elsewhere. This dynamic is is illustrated with five concrete examples in the following paragraphs.

The examples include figures to visualize the dynamics. Figure 4.7 presents the meaning of the symbols used in these figures.

Symbol	Meaning	Explanation
	Governments	The symbol represents an actor with a primary role in governments. It is positioned in the phase where that actor is currently active or needed.
	Industry	The symbol represents an actor with a primary role in industry. It is positioned in the phase where that actor is currently active or needed.
	NGOs	The symbol represents an actor with a primary role in NGOs. It is positioned in the phase where that actor is currently active or needed.
	Financial Institutions	The symbol represents an actor with a primary role in Financial Institutions. It is positioned in the phase where that actor is currently active or needed.
	Knowledge Institutes	The symbol represents an actor with a primary role in Knowledge Institutes. It is positioned in the phase where that actor is currently active or needed.
Italic text	Responsibility	Indicates a specific responsibility that corresponds with a given actor and phase according to the sustainable transformation theory (Appendix D)
Bold text	Phase	Refers to one of the four phases of system transformation: 1. Inception, 2. Competitive Advantage, 3. Synergy, 4. Institutionalization.
	Dependency	Indicates that an actor in a later phase (to the right) is waiting for another actor still in an earlier phase (to the left). This shows dependencies between actors, phases and challenges.
	Desired progress	Some actors express the willingness to fulfill a role that belongs to a future phase. This arrow shows the desired or intended progression of that actor within the system.

Figure 4.7: Meaning and explanation of symbols

4.8.1. Example 1: Financial institutions - Knowledge institutes

Financial institutions, particularly banks, have progressed through all four phases of the sustainable transformation framework with regard to energy, one of the nine transition domains within urban area development. This is presented in table 4.1, which presents both the expected actions for each phase according to the sustainable transformation theory, and empirical examples drawn from interviews.

	Inception	**Competitive Advantage**	**Synergy**	**Institutionalization**
Expected Action	Apply negative screening to end relationships with high-risk clients	Engage with all clients, especially laggards	Create financial solutions to support scaling	Integrate new criteria into investment policies
Empirical Example	*"For new clients, energy label requirements apply. If you don't meet them, you won't get a loan."* (F.4)	*"It's a bit more difficult with existing clients. We try to support them with knowledge, networks, and tailored financial products."* (F.4)	*"You receive a discount if your energy label is higher, we have specific financial products to help with that."* (F.4)	*"Minimum energy label requirements are integrated. That gives us leverage, we can really be more strict."* (F.4)

Table 4.1: Transition progress of financial institution for energy

Banks are now aiming to follow a similar trajectory for other themes, such as biodiversity (ecological transition), circularity (circular economy transition) and social impact (health and wellbeing). For these themes, they are also helping clients with knowledge, networks and financial products and want to integrate criteria into their policies. Thereby, moving from the **synergy** to the **institutionalization** phase: *"We're quite strict when it comes to energy labels, and I hope we'll get to that level with other aspects of sustainability as well, but we're not there yet"* (F.1).

However, the main challenge identified by the bank is that they lack the tools, data and frameworks necessary to address these themes effectively (see Figure 4.6). The issue is the absence of measurable financial benchmarks, which makes it difficult to incorporate biodiversity, circularity or social sustainability into investment decisions.

According to the sustainable transformation framework, the development of such benchmarks is the responsibility of knowledge institutes in the **competitive advantage** phase. While these institutions acknowledge this role: *"Our role is to help make that social side easier to measure"* (K.2), the tools or methods needed by financial institutions have not yet been developed. As a result, banks that are ready to move forward find themselves held back, illustrating a lack of alignment between these actor groups.

This dynamic is illustrated in Figure 4.8, which shows how the challenge of a lack of measurable financial benchmarks, as identified in earlier sections of this chapter and presented in Figure 4.6, is situated within the broader system of urban area development. It demonstrates how the role banks see for themselves in enabling sustainable ambitions depends on the actions of other actors. The example shows that responsibilities between actors are not well aligned, which causes progress to stall even though banks are ready to move forward.

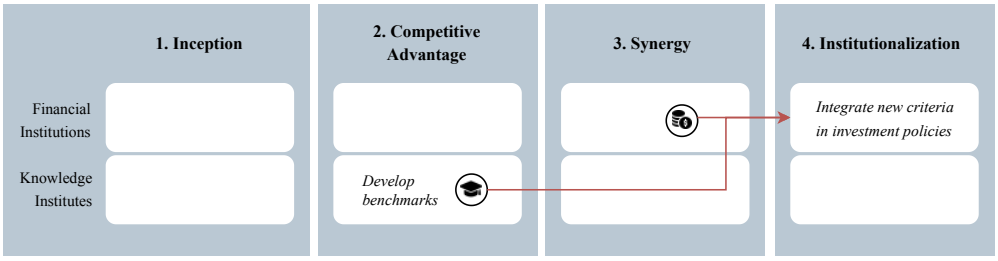

Figure 4.8: Responsibilities of financial institutions and knowledge institutes

4.8.2. Example 2: Governments - Industry

Municipal governments express ambitious sustainability goals in their policy agendas. These ambitions reflect characteristics of the **synergy** phase, where policy goals are developed. However, municipalities identify the lack of legal instruments as a key challenge for realizing these ambitions. The ability to turn policies into enforceable regulations belongs to the **institutionalization** phase, which municipalities have not yet reached but which they desire to move toward.

At the same time, municipalities depend on developers, housing associations, and other industry actors to realize their policies. Not only in terms of sustainability, but also for broader tasks such as housing. If sustainability requirements exceed what is financially viable for these actors, municipalities risk blocking development altogether. Industry actors tend to implement policy goals related to sustainability only when they align with their business models and remain profitable. As one interviewee explained: *"The primary interest of a market party is continuity. And for continuity, profit is necessary"* (I.6) and "*If it costs money and is not legally required, it is rarely implemented voluntarily*" (I.2).

While some industry actors are working on more sustainable business models, for example by using circular calculation methods for public buildings, they still face major challenges related to limitations in their business models (see Figure 4.6) which holds them in the **competitive advantage** phase. In many cases, sustainability does not yet fit into existing structures (see Figures 4.2 to 4.5). Figure 4.9 illustrates how governments depend on industry actors. Importantly, progress does not depend on the development of one single sustainable business model, instead, all of the business models from industry actors must overcome their respective challenges (e.g. reliance on short-term income, maximum rent levels) in order to move forward, demonstrating the magnitude and complexity of this challenge in the overall system.

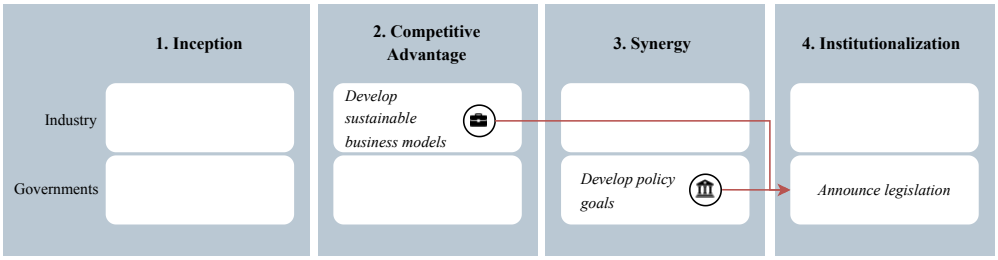

Figure 4.9: Responsibilities of governments and industry

4.8.3. Example 3: Financial Institutions - Industry

Institutional investors express interest in making long-term, sustainable investments in real assets, such as land, real estate, water and infrastructure. Their goals reflect the **synergy** phase of the transformation framework, as they aim to link long term investments to assets in urban areas. However, they perceive the lack of suitable investment products (see Figure 4.6) as a key challenge in fulfilling this responsibility. As one interviewee stated: *"Research shows that the demand for impact investments is very high and continues to grow, but the supply remains relatively limited"* (F.5).

Meanwhile engineering and consultancy firms are working on developing new investment products for real assets that meet the criteria of institutional investors. These efforts correspond with the **inception** phase of the sustainable transformation framework, where pilot projects take place: *"They are now preparing a pilot that will hopefully start this summer"* (F.5).

However, institutional investors refrain from investing in early-stage or high-risk projects. They rely on scalable, proven solutions before committing substantial capital. This means they are dependent on industry actors to first develop these new products. Yet these industry actors are still in the early stages of development, creating a phase misalignment, where institutional investors are ready to invest, but the necessary instruments are not there yet. Figure 4.10 illustrates how this mismatch prevents financial institutions from moving to the synergy phase.

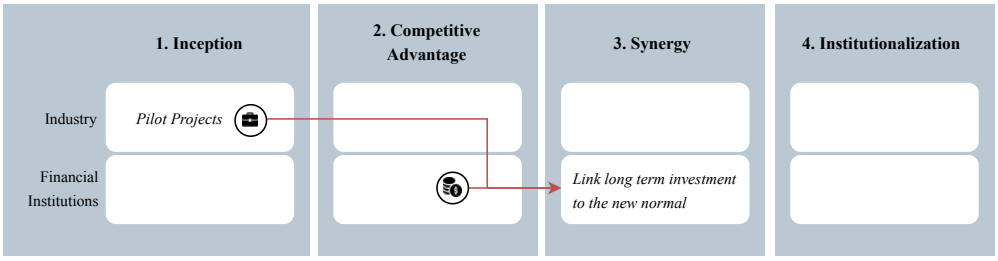

Figure 4.10: Responsibilities of financial institutions and industry

4.8.4. Example 4: Financial Institutions - Governments

Several interviewees mentioned challenges related to governments not having a clear and consistent vision for sustainability (see Figure 4.6). Knowledge institutes questioned what transition we are actually managing, and pointed to the lack of a clear policy vision. An industry actor described this as vision ambiguity. This lack of clarity makes it difficult for financial institutions to invest. One interview example illustrates this challenge: a project involving geothermal energy initially included a financial investor, who later decided to withdraw. As the interviewee explained: *"They stepped out with the thought: politics have shifted and things are becoming too uncertain. How sure is it really that we will move away from gas to something else? If we end up staying with gas, then it makes little sense for us to drill geothermal wells everywhere"* (I.4).

This example shows that investors are willing to create financial solutions to support scaling, which aligns with their responsibility in the **synergy** phase. However, they will only do so if there is a clear and reliable vision, which aligns with the responsibility of governments in the **competitive advantage** phase. Without such direction, the perceived risks are too high and investors step back. Figure 4.11 visualizes this misalignment between government responsibility and the desired progress of the financial institution.

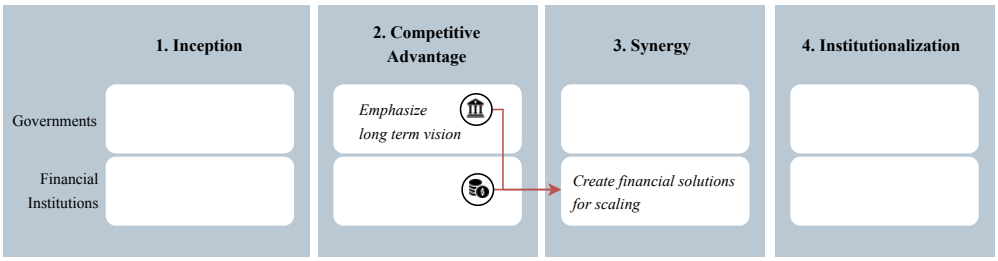

Figure 4.11: Responsibilities of financial institutions and governments

4.8.5. Example 5: NGOs - Industry

NGOs see a role for themselves in enabling sustainability ambitions by contributing knowledge and providing guidance throughout the development process. According to the sustainable transformation framework, NGOs are also expected to be involved in projects. This responsibility aligns with the **inception** phase. However, they experience the challenge of difficult collaboration with commercial actors (see Figure 4.6). Environmental organizations experience that industry parties control decision-making. As one respondent explained: *"The party that brings in the most money gets to decide what the final result looks like. That's one reason we're often not involved in projects. I have had too many negative experiences with that"* (N.2). When industry actors do not support foundational efforts, such as recognizing the problem, or making room for societal input, NGOs choose to step back and not be involved in development projects. This dynamic is shown in Figure 4.12, which illustrates how NGOs

depend on industry actors to create the conditions that allow them to fulfill their role in the inception phase.

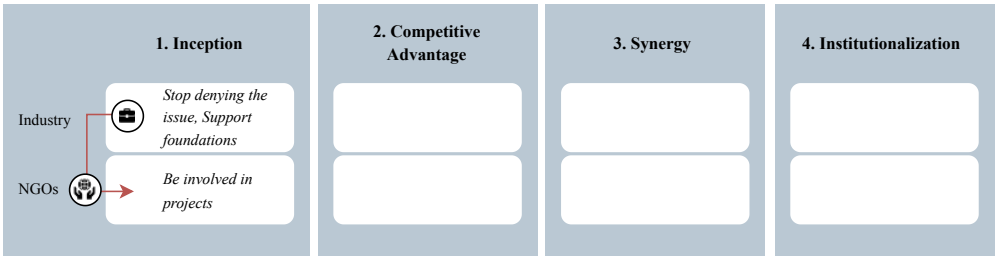

Figure 4.12: Responsibilities of NGOs and industry

4.8.6. Synthesis of Examples

Analyzing the challenges from the actors with the phases of the sustainable transformation theory helps to understand the interrelated complexity of the actors and the challenges identified in Section 4.1 to 4.6. It reveals that many challenges to sustainable urban area development are not isolated but part of systemic misalignments between actors and actor groups.

These misalignments occur because actors operate in different phases of the transition process. For instance, some financial institutions are ready to scale up (synergy phase), but are held back by lagging development of investment products from industry actors (inception phase), or by policy uncertainty from governments (competitive advantage phase). Similarly, NGOs may be expected to be involved in projects, but depend on industry actors to first create the necessary conditions for engagement.

This phase analysis shows that progress towards sustainability is not only about overcoming individual challenges per actor, but also about aligning progress across actors in the broader transition of urban area development. Because of their dependencies, actors cannot enable sustainability ambitions in isolation. Moreover, systemic bottlenecks appear and structural transitions can stall when one group is ready to move forward, but others are not.

To illustrate this dynamic more clearly, Figure 4.13 synthesizes the findings from the illustrative examples into a single overview. It should be emphasized that the figure presents an illustrative interpretation based on selected examples and specific interview findings. It does not imply that, for example, all housing associations are universally situated in the competitive advantage phase. Instead, it serves to demonstrate how phase misalignments between actors can hinder collective progress toward sustainable urban area development and enabling sustainability ambitions, thereby providing a deeper understanding of the identified challenges in this research.

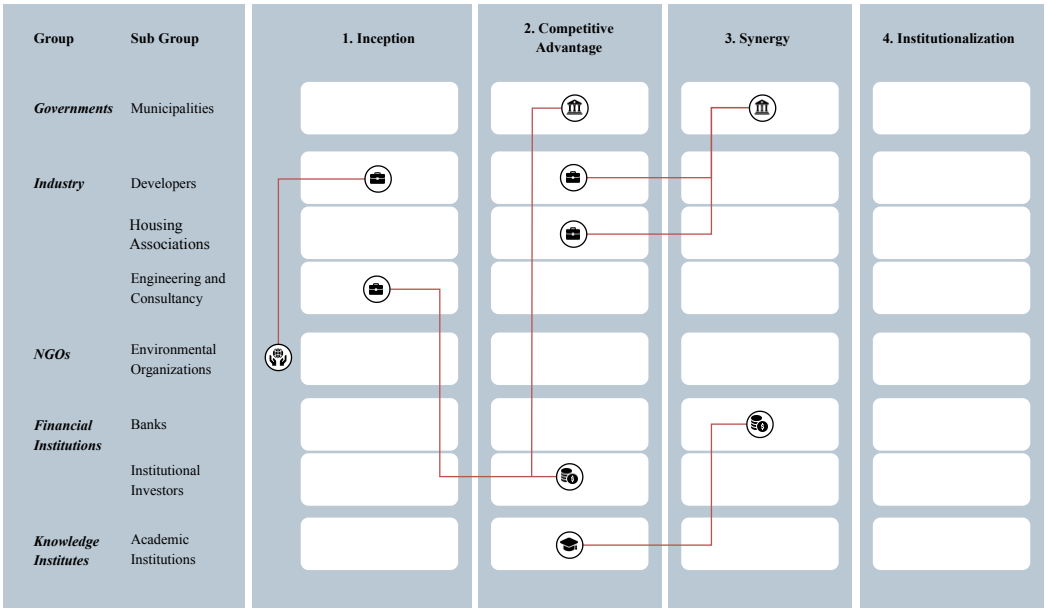

Figure 4.13: Analysis overview

Figure 4.13 provides an overview of actor positions across the phases of the sustainable transformation process in the context of urban area development. It demonstrates the complexity and dependency of the actor roles and challenges they encounter in realizing sustainability ambitions in urban area development. Rather than operating in isolation, actors are deeply embedded in a system of dependencies, where progress by one is often contingent upon actions by others. The figure highlights several key aspects of these dynamics within the system.

First, it shows that urban area development consist of multiple sub-actors within each actor group, each operating at different phases of the transition process. The presence of so many actors increases the overall complexity of the system, as it introduces a greater number of responsibilities and potential dependencies between actors.

The red arrows in the figure represent these dependencies between actors. In each case, the actor on the right is dependent on an action or responsibility of the actor on the left. While the actor on the right expresses readiness to move into the next phase, progress is blocked by the fact that the other actor remains in an earlier phase. This illustrates that actors cannot move through the transition process in isolation. Moreover, progress requires coordination across actor groups.

This insight offers two possible interpretations regarding the effect of cross-domain roles. On the one hand, these cross domain roles increases complexity because actors have more responsibilities that can cause dependencies. Meaning, actors may face different challenges and responsibilities across roles (primary, secondary etc.), transition phases (inception, competitive advantage, etc.) and even transition types (water transition, energy transition, etc.) in the transition towards sustainable urban area development. From another perspective, however, the ability to fulfill responsibilities primarily associated with other actors could also simplify dynamics. When actors fulfill several roles themselves, they may be less dependent on others to make progress. This allows the actors to internally align responsibilities that would otherwise be spread across different actors in the system.

Figure 4.13 demonstrates that the complexity of urban area development is not only shaped by the number of actors and challenges, but also by the dependencies in their progress. It shows that when actors move through phases at different speeds, misalignments can occur. These misalignments may result in systemic bottlenecks. Systemic bottlenecks are situations where the lack of progress by one actor delays or obstructs progress for others, ultimately hindering transformation at the system level.

Overall, the results highlight the complexity of the system of urban area development and the realization of sustainability ambitions within it. This complexity is not only caused by the large number of involved actors or the amount of challenges they face. The complexity is unpacked even more when viewed through the phase perspective of the sustainable transformation theory. Applying this lens reveals that, just as multiple transition domains (water transition, energy transition, etc.) co-evolve and interact within the broader transition of the urban area development regime, so too do the various actor groups.

This adds an additional layer of complexity to the system. Each actor progresses through different phases of transformation, and their ability to move forward depends on the progress of others. These dependencies create a dynamic in which misalignment between actors hinders collective change, allowing the gap between sustainability ambition and realization to persist.

5

Discussion

This chapter discusses the findings of this research, which aimed to provide insight into the complex environment of urban area development and the enabling of sustainability ambitions by using the lens of transition theories. To achieve this, the study combined theoretical research and semi-structured interviews. The qualitative and exploratory nature of this study allowed for an in-depth exploration of the urban area development context.

The research is structured around three research objectives:

i. To understand the characteristics of urban area development.
ii. To explore the challenges that hinder the realization of sustainability ambitions.
iii. To uncover the systemic complexity of the challenges within urban area development.

This chapter is structured as follows. First, the theoretical and empirical findings are presented. Thereafter, the implications of the research are discussed, including its relevance, relation to existing literature and its practical implications. The chapter concludes with discussing the limitations of the research and offers recommendations for future studies.

5.1. Research Findings

5.1.1. Theoretical Research Findings

The theoretical research formed the foundation for understanding the complex environment in which sustainability ambitions in urban area developments must be enabled. It addresses the foundation of all three research objectives by offering insights into the characteristics of urban area development, the challenges in realizing sustainability ambitions and various transition theories to understand upon the systemic complexity.

The first key findings are about understanding the characteristics of urban area development. Urban area development is defined as the process of connecting functions, disciplines, stakeholders, interests and financial flows, with the aim of transforming or expanding parts of neighborhoods or cities within a timeframe of five to twenty years or more (Franzen et al., 2011; Verdaas & Verheul, 2022). Within this process, there are six core aspects that need to be integrated and coordinated: scale, sectors, development phases, disciplines and expertise, physical and spatial coherence and actors (Franzen et al., 2011). Next to these core aspects, urban area development is shaped by its legal and financial frameworks.

Second, literature highlighted that the realization of sustainability ambitions is obstructed by various challenges, which are grouped into three categories: financial, policy and regulatory, and organizational. Financial challenges included high costs of sustainability, lack of financial resources, financial risks, short-term business models and split-incentives. Policy and regulatory challenges related to conflicting policy goals, ambiguity in legislation, restrictive legal frameworks and the frequent stacking of ambitions. Lastly, organizational challenges included a lack of human or technical resources, a lack of collaboration, insufficient coordination, limited knowledge and awareness, and a lack of skills and expertise to implement sustainable ambitions effectively. These findings showed that the challenges are not just technical in nature, but reflect deeper structural issues.

Next, the theoretical research has given insight into an approach to address these deeper structural issues. The challenge of realizing sustainability ambitions in urban area development is understood as a wicked problem (Rittel & Webber, 1973). Therefore, it is argued that enabling ambitions in urban area development requires fundamental transformations of the underlying structures of the system. Literature shows that the culture, structures and practices (regime) of urban area development are in transition (Peek & Troxler, 2014), as well as the thematic transition domains that shape urban areas (Ernst et al., 2015). These are water, energy, mobility, circularity, health and wellbeing, urbanization, data, ecology and agriculture (Nillesen, 2023). These thematic transition domains interact and co-evolve within the broader transition of the urban area development regime.

To help navigate this complexity, the sustainable transformation theory was introduced as a relevant framework to understand how transitions towards sustainable outcomes can be enabled. This theory emphasizes that achieving systemic change depends on the actions of actors (*governments, industry, NGOs, financial institutions and knowledge institutes*) to fulfill specific responsibilities across different transition phases (*inception, competitive advantage, synergy and institutionalization*) (Nijhof et al., 2022). These theoretical insights formed the foundation for deepening the understandings of the research objectives.

First, the five actor groups have been applied to the context of urban area development. By zooming in on actors, as one of the core aspects of urban area development, this provided a deeper understanding of research objective one. The findings of this analysis where as follows. The government group includes the national government, provinces, municipalities, with its regulatory, executive and financial departments, and public organizations. Industry consists of developers, housing associations, engineering and consultancy firms, design and construction actors such as builders, designers, architects and suppliers, as well as estate agents and utility companies. NGOs are classified into interest groups, environmental organizations and organized civil society. Financial institutions include banks, institutional investors and property investors. Knowledge institutes are divided into academic institutions and independent research institutes.

Although each group has typical responsibilities in the context of regular market systems, such as governments establish the legal and regulatory framework, industry delivers products and services, NGOs

advocate for public values, financial institutions provide capital and knowledge institutes contribute through research and innovation (Het Groene Brein, 2021), the research showed that these roles often overlap in urban area development, resulting in cross-domain actor roles. The European Union, national government and provinces not only fulfill a regulatory role, but also act as financial institutions by allocating funds or subsidies to developments. Municipalities play roles as regulators (*government*), developers (*industry*) and financiers (*financial institutions*). Public organizations can function as both governmental and industrial actors. Developers act as industry actor and financial institution by both delivering products and providing capital. Housing associations fulfill roles in industry, finance and civil society, aligning them with the groups of industry, financial institutions and NGOs. Environmental organizations can invest in land or projects, thereby having a financial and industrial role. Lastly, organized civil society may also function as financial institution, for example through co-financing.

Based on these findings, a conceptual structure emerged that combines the actor groups with key categories of challenges. This structure served as a foundation for the empirical phase of the research, enabling a more systematic investigation into how different actors perceive and experience the challenges of realizing sustainability ambitions. In addition, the phase component of the sustainable transformation theory was chosen to further explain the empirical challenges and guide the analysis.

5.1.2. Empirical Research Findings

Empirical insights were derived from 24 interviews with a variety of actors representing the main groups of the sustainable transformation theory and the subgroups identified in the theoretical research. These interviews served to deepen the understanding of the research objectives.

The results showed that all actor groups see a role for themselves in urban area development and realizing sustainability ambitions within. Governments and industry actors are more directly involved in the process and play key roles in early stage decision-making. Other actors, while less directly engaged, also express a willingness to contribute.

NGOs see themselves as partners in promoting sustainability, aiming to offer knowledge and guidance in the process. Among financial institutions, different roles are emphasized. Banks view their role as one of setting frameworks and providing incentives. Insurers see themselves as playing a key role in sharing knowledge and risks, issuing early warnings and facilitating recovery after damage. Institutional investors position themselves through impact investing, in which they actively seek to generate measurable social and environmental outcomes alongside financial returns. Finally, knowledge institutes see a role for themselves as connecting actors, capable of maintaining neutrality, providing depth, articulating underlying questions and conducting research to make sustainability measurable.

However, the actors experience a variety of challenges in fulfilling their role and contributing to realizing sustainability ambitions. These challenges are categorized into financial, policy and regulatory, and organizational challenges. Compared to the theoretical findings, the empirical results offered two important extensions. First, they broadened the scope of the challenges by including a wider range of actors. Second, they provided a more detailed and actor specific understanding of those challenges.

For instance, the concept of short-termism, identified in literature as a financial challenge, differed in perception among different actors. Developers experience it in the form of short-term and sale-based business models, municipalities are constrained by short-term political cycles, and research institutes face short-termism in their research focus. Other challenges where further explained with practical insights through the business models of various actors. Developers struggle primarily with sale-based income models, housing associations are constrained by maximum rent levels, and investors face difficulties due to short payout cycles to their clients.

In addition, high costs were frequently mentioned by government and industry actors. Actors in other groups did not mention these issues, but often expressed other issues such as a lack of involvement or limited agency when involved. This difference in perceived challenges among actor groups is explained by the fact that both government and industry actors are directly involved in decision-making processes early in the development. As a result, they are more deeply embedded in the practices and structures of the urban area development system.

To overcome these challenges, the involvement of other actor groups is necessary. However, as they

experience challenges in being involved, they do not have the opportunity to raise their perspectives during the early phases, such as the initiation phase. Yet this is precisely the phase in which ambitions are defined.

Some challenges appeared to be specific to certain actor (sub) groups. For instance, insurers indicated the need to adjust their risk assessment models to reflect long-term dynamics instead of relying on historical data. NGOs highlighted that their involvement often served more as a form of legitimacy than as meaningful participation. Knowledge institutes faced challenges due to academic reward systems that limits their ability for practical engagement. Institutional investors, struggled with the absence of suitable investment products that enable long-term investment in urban areas. These challenges showed that early involvement of these actors is not a straightforward solution and many other challenges are experienced across all actor groups, further illustrating the complexity of the system.

Next, the findings validated the cross-domain actor roles and showed that many actors have responsibilities that extend beyond their primary classification. In addition, the results revealed further insights, concerning the governmental role of banks and industry role of insurers.

Lastly, the challenges have been further unpacked by an analysis of the interview data using the phase component of the sustainable transformation theory. This revealed five illustrative examples in which the challenges and roles of specific actor groups are dependent and closely interconnected. These examples showed that when actors are not aligned in their transition phases, progress is hindered. For instance, banks face difficulties due to the lack of action from knowledge institutes, which are expected to develop new benchmarks. Governments want to embed sustainability into regulations but are dependent on industry actors whose business models do not support such ambitions. Institutional investors experience challenges as they wait for scalable solutions from engineering and consultancy firms. Financial institutions are hesitant to invest without a clear long-term vision from public authorities. Finally, NGOs are unable to fulfill their role in project participation due to the dominant behavior of industry actors.

A synthesis of these examples showed the dependencies and the unaligned positions of actors in phases of transition. Municipalities operate in the *competitive advantage* or *synergy* phase, while developers are in the *inception* or *competitive advantage* phase. Housing associations are also in the *competitive advantage* phase. Engineering and consultancy firms still need to fulfill responsibilities in the *inception* phase and environmental organizations have not yet entered this first phase. Institutional investors are positioned in the *competitive advantage* phase, while banks appear stuck in the *synergy* phase. Knowledge institutes still need to fulfill their responsibilities in the *competitive advantage* phase.

Rather than implying that all actors are positioned exclusively in those specific phases, the synthesis illustrated how actors are spread across different phases of the transition. It highlights the complexity and dependency of their roles and the challenges they face in realizing sustainability ambitions within urban area development. The analysis shows that when actors move through different phases at different speeds, misalignments can occur that result in systemic bottlenecks. Systemic bottlenecks are situations where the lack of progress by one actor delays or obstructs progress for others, ultimately hindering transformation at the system level. Overall, rather than acting in isolation, actors are embedded in a system of dependencies, where progress by one often depends on the actions of others. These dependencies create a dynamic in which misalignment between actors hinders collective change, allowing the gap between sustainability ambition and realization to persist.

5.2. Implications

This section discusses the broader implications of the findings. First, the research relevance is discussed. Thereafter, the relation to existing literature is explored. Lastly, the practical implications are discussed, bridging the theoretical insights with real-world application in the context of sustainable urban area development.

5.2.1. Research Relevance

The scientific relevance of this research lies in its contribution to transition literature on urban area development by highlighting the role of a broad range of actors in enabling transitions in this context. Rather than focusing solely on the traditional public-private division, this study includes financial institutions,

NGOs and knowledge institutes, thereby offering a more complete picture of the system. By applying the sustainable transformation theory to these diverse actor groups, it gives a deeper understanding of the challenges in realizing sustainability ambitions.

The practical relevance of this research lies in its emphasis on the interconnectedness of all actor groups involved in area development. It shows that every actor can play a meaningful role and that the challenges faced by a single actor can lead to systemic bottlenecks that hinder progress for all. Sustainability is not achieved by pointing fingers at others, but by recognizing that responsibility is shared by all actors.

5.2.2. Relation to Existing Literature

This paragraph reflects on how the findings of this study relate to existing literature. First, the results are compared to previously discussed studies on the challenges of realizing sustainability ambitions. Then, the findings are related to transition theories. Finally, a brief targeted literature search was conducted to identify recent studies with comparable focus areas, allowing for further comparison and contextualization of the outcomes.

Literature on Sustainable Ambitions

As previously discussed, there is an alignment between the empirical findings of this study and the challenges identified in existing literature. Financial, policy and regulatory, and organizational challenges frequently cited in prior studies are all mentioned by the interviewees.

By incorporating perspectives from underrepresented actor groups such as NGOs, financial institutions, and knowledge institutes, this study broadens the scope of traditional area development research and highlights how responsibilities, influence and challenges are distributed more widely. In doing so, it adds to the current understanding of the challenges in achieving sustainability ambitions.

However, while existing literature often centers on the responsibilities of a single actor group, typically governments, who are urged to prioritize or take a stronger lead, this study shows that such a focus is insufficient. Without action and alignment from other actor groups, systemic challenges persist and can continue to hinder progress towards sustainable outcomes.

Transition Literature

Existing literature establishes that urban area development is undergoing a transition and that various thematic domains within urban areas, such as energy, mobility, and circularity, are also experiencing transitions that co-evolve and interact within the broader transition of the urban area development regime. According to transition theory, all these transitions unfold across three levels, the niche, regime, and landscape levels, known as the multi-level perspective (Geels, 2002). Also, the transitions progress through distinct phases as described in the multi-phase perspective (Rotmans et al., 2001).

This study builds upon, rather than contradicts, current transition literature. It aligns with the foundational concepts of multi-level and multi-phase transition theories, but contributes by offering a distinct perspective on the transition of the urban area development regime. Specifically, it shifts the focus toward the role and positioning of actors within this transition.

Existing literature acknowledges the importance of actor collaboration. For example, the role of small actor networks in supporting niche innovations that may transform the regime (Geels, 2002). However, the complexity of actor dependencies and misalignment across transition phases has received limited attention in the context of urban area development. This study addresses that gap by illustrating how actors operate in different transition phases, and how a lack of coordination and dependencies between them can hinder collective progress.

New Literature

Based on the findings of this study, a small targeted literature search was conducted to identify recent studies that also connect actor roles to sustainability transitions. One relevant example is the study by Hagbert and Malmqvist (2019), which focuses on Swedish sustainable housing. They explore how different types of actors, such as the state, market, and community, understand and take on roles related to sustainability. Their findings partly overlap with this study. For instance, they show that

market actors are increasingly willing to address sustainability, but still operate within a profit-oriented logic. Also, community actors play an important role in driving change, but lack real structural influence.

Both the Swedish case and this study come to a similar final conclusion: no single actor can lead sustainability transitions alone. Achieving real change requires cooperation between different actors, each with their own role and perspective. Interestingly, Hagbert and Malmqvist (2019) give more attention to the role of residents, which this study does not include in its empirical research. Since other literature also highlights the importance of end-users, this could be a useful direction for future research.

5.2.3. Practical Implications

This paragraph bridges the theoretical findings with the practical context. While the findings address systemic change on a theoretical level, they also provide concrete insights and recommendations for enabling sustainability ambitions within the practice of urban development projects.

The results show that governments and industry actors often experience challenges such as high costs and the stacking of requirements. In contrast, NGOs, financial institutions and knowledge institutes indicated that they do not face these particular problems. Some mentioned that they have sufficient resources, or that they can contribute by connecting requirements across projects. However, these actors also noted that they often experience a lack of early involvement in development processes. As a result, actors who do not face the dominant challenges of governments and industry, and who might be able to help address them, are not given the opportunity to contribute their perspectives during early phases such as the initiation phase. Yet this is precisely the phase in which ambitions are defined. Based on these findings, it is recommended to consider involving all five actor groups early in the process.

More specifically, it would be advisable to bring together representatives from governments, industry, NGOs, financial institutions and knowledge institutes during the initiation phase. This early dialogue may help for the identification of each actors challenges and potential contributions, and clarify how each actor perceives their role. For instance, a municipality may have ambitious sustainability goals that do not align with the business models of private developers. Financial actors may be willing to invest in sustainable projects but require evidence from successful practices. NGOs may hold valuable project specific knowledge but often need more structural support to participate meaningfully. By making these dependencies visible and open to discussion, actors can explore responsibilities and negotiate what is feasible, both individually and collectively. Such understanding may enable setting shared goals, rather than fragmented agendas pursued without coordination. This highlights the fact that everyone can contribute, even if it means that one actor steps back while another moves forward. As Nijhof (2024) noted: *“We don’t create music when all instruments play over each other in chaos. Music happens when we agree on who plays what, and when, but also when certain players must stop and allow silence.”*

Although this research adopts a holistic perspective and acknowledges that there is no single solution to enabling sustainability ambitions, several actor-specific suggestions can be formulated based on the findings:

- Governments often take the lead in setting broad sustainability ambitions, a responsibility typically associated with the synergy phase. However, these ambitions may lack support from clear, concrete visions. These visions are a responsibility in earlier phases. It is therefore recommended that governments reflect on their own role and consider what enabling conditions are needed from their side. Rather than relying on national legislation to eventually mandate action, it may be more effective to proactively define and communicate their vision to guide and engage other actors.
- Industry actors are advised to remain aware of the potential consequences of their dominant position. While they face valid challenges, they may unintentionally limit the agency of other actors. The results suggest that actors such as NGOs, financial institutions or knowledge institutes could offer knowledge or resources that help make sustainability more feasible. By engaging more openly with other actors, industry could shift from being a limiting factor to an enabler of change.
- NGOs are encouraged to engage earlier in the process, where possible. At the same time, the results show that NGOs often experience symbolic participation without real influence, and that

this leads some to stay at a distance. It may therefore be helpful for both NGOs and other actors to establish conditions that support meaningful involvement, and to reflect on previous experiences of collaboration.

- Financial institutions are often already advanced in integrating sustainability into their operations, partly due to regulatory frameworks such as ESG criteria. However, rather than waiting for stricter policies, it may be beneficial for them to actively explore where they can already support others in the system, by offering expertise or developing new financial products, or identifying viable investment paths. Early involvement in projects can help identify such opportunities.
- Knowledge institutes could be more explicitly recognized as actors and involved across all phases of urban development. These actors carry key responsibilities, such as developing benchmarks, quantifying sustainability impacts and identifying good practices. One example is the Groene Baten Planner, a tool developed by a Dutch research institute that calculates the societal benefits of green infrastructure. This shows how academic and applied knowledge can support informed decision-making in sustainable development.

5.3. Limitations

This section discusses the main limitations to this research that are important to consider. While efforts were made to ensure a comprehensive approach, some methodological and practical limitations should be acknowledged.

5.3.1. Limitations to Research Method and Scope

This study relies on qualitative interviews as its primary empirical method. Although a diverse group of actors was selected, the sample remains limited in size. In some cases, only one representative was interviewed per subgroup, meaning that these findings could not be validated or compared with other perspectives.

Furthermore, actors from higher levels of government, such as provinces and national government, were not included in the empirical part of this study. As a result, the roles, responsibilities and challenges of these actors remain underrepresented. Given that recent literature highlights the growing importance of provincial governments in urban area development, future research could explore this actor group in more depth.

Similarly, design and construction actors were not interviewed. While they play an important role in urban area development, they typically operate on behalf of clients, much like engineering and consultancy firms. Due to time constraints, the decision was made to exclude these actors from the interviews.

The broad scope of study, aimed at understanding the system of urban area development, was a deliberate choice. However, this also means that certain actor specific insights may be underdeveloped. A more focused case study could complement this research by offering more depth on individual perspectives within the context of a single area development.

5.3.2. Limitations to Execution

The first round of interviews was conducted using a protocol that may not have had a fully neutral tone. This could have had an influence on how some respondents framed their answers, potentially steering them in a certain direction.

In addition, the perspective of an institutional investor was included only indirectly, through an expert with professional experience in working with such institutions. Although this gap was partly addressed by reviewing relevant literature related to the topics discussed, the absence of a direct interview with an institutional investor remains a limitation of this study.

5.3.3. Limitations to Theoretical Framework

The research did not aim to identify the most comprehensive or ‘best’ transition theory available. Instead, the sustainable transformation theory was selected as a framework that could offer new insights when applied to the context of urban area development and enabling ambitions within. While this framework proved useful in structuring the actors and executing the phase analysis, it also comes with its

limitations.

For instance, the roles of different actor groups in urban area development were not always clearly separated as in regular market systems. Some actors appeared to operate across multiple roles simultaneously. In this research, such overlaps were interpreted as indications that actors can take on roles within multiple groups. However, it could also suggest that certain actors do not neatly fit into the predefined categories of the sustainable transformation theory and are required to assume alternative roles and responsibilities. Therefore, the framework should not be regarded as a precise representation of reality. Instead, it is a helpful tool to better understand patterns, connections and challenges, while recognizing that real-world situations are even more complex.

The final limitation relates to the use of the theoretical framework. Initially, this research applied a different component of the sustainable transformation theory to interpret the results: the four system loops. As explained in paragraph 2.3.3, the theory describes that a system is maintained by two main forces: the market dynamics and the enabling environment. This perspective was first chosen because it seemed to offer a useful way to better understand the challenges. Market dynamics, such as business models and financial incentives, appeared difficult to change, and legal frameworks determined what was or was not possible in realizing ambitions, showing the dominant influence of these two forces.

According to the theory, these two forces can be disrupted by two other loops: alternatives and externalities. However, analyzing the results using these loops was less helpful in identifying how the problem might be addressed. The ‘alternatives’ and ‘externalities’ perspective offered little beyond the conclusion that a lack of alternatives where not the problem, but that structural problems related to externalities, like split-incentives need to be resolved. Because of a preference for solution-oriented thinking, the phase component of the theory was more useful and led to greater satisfaction with the results. It provided a clearer understanding of the system by including the actor perspective.

However, switching between parts of the theory also brings some limitations, as changing the analytical lens can influence how the findings are interpreted. At the same time, this illustrates that applying different theoretical perspectives can lead to different results and different conclusions.

5.4. Recommendations

Based on the findings and limitations of this study, several recommendations can be made for future research. As this research was conducted within the limits of time and available resources, follow-up studies are needed to further deepen and refine the insights gained. Multiple directions for future research are proposed, including gaps and opportunities to explore specific aspects in more detail.

1. Examine progress in distinct transition domains

This study acknowledges the existence of parallel transitions within urban area development, such as water, energy or mobility. It also found that actors may be in different transition phases across these domains. For example, Table 4.1 illustrates the progress made in the energy domain. Future research could investigate the dynamics of specific transitions to better understand how progress in one domain affects the overall transition of urban area development.

2. Focus on underrepresented actor groups

While this research offers a broad overview of system wide challenges, certain actor groups remain underrepresented. Actors from higher levels of government, such as provinces and national authorities, were not included in the empirical research, despite their growing role in urban area development. Similarly, design and construction actors were excluded due to time constraints, although they play a key role in implementing sustainability measures. Future research could explore the perspectives and challenges faced by these groups in more depth. Additionally, including more participants per actor group or subgroup would strengthen the reliability and generalizability of the findings.

3. Include end-users

As discussed in Section 5.2.2, including end-users could offer valuable insights into how sustainability ambitions and its challenges are perceived at the user level. Moreover, end-users may also take on various roles associated with the sustainable transformation theory. For example, by contributing

knowledge (as knowledge institutes), advocating for values (as NGOs) or providing funding through co-investment (as financial institution). This raises the question of whether end-users could act as drivers of transition themselves, making their role a relevant subject for future research.

4. Conduct case study research
Due to time and scope limitations, this study did not include case studies. Future research could apply the actor perspective to concrete urban development projects to examine how the five actor groups are involved, which roles they take on, and how the system functions in a project. This could provide even more in-depth findings to this research.

5. Investigate conflicting ambitions and goals
Conflicting policy ambitions were frequently mentioned during the interviews, but not explored in depth within this study. Future research could examine which ambitions or transition processes are in conflict, and how these conflicts affect the realization of ambitions in urban area developments.

6. Explore international contexts
This study focused on the Dutch context of urban area development. Future research could explore whether similar actor groups, challenges and transition dynamics are present in other countries. Comparative studies could investigate to what extent the roles and dependencies identified in this research also apply in different systems, structures and cultures. Such international perspectives could broaden the understanding of how sustainability ambitions are enabled, or hindered, across varying institutional and cultural settings.

6

Conclusion

This chapter answers the central research question that guided this study:

How can transition theories contribute to enabling sustainability ambitions in the complex environment of urban area development?

To answer this question, the study adopted an exploratory approach and addressed six sub-questions. These sub-questions provided a pathway towards answering the main research question, each contributing to a more detailed understanding of the characteristics, challenges and systemic complexity of realizing sustainability ambitions in the context of urban area development.

First, the key findings of each sub-question are presented. Thereafter, the main research question is answered.

6.1. Conclusion Sub-Questions

Sub-Question 1: What does the complex environment of urban area development entails?
Urban area development in the Netherlands is a domain of practice focused on designing, financing, realizing and managing the transformation or expansion of urban areas. The process is long-term and multi-dimensional and is shaped by six core aspects: scale, sectors, development phases, disciplines and expertise, physical and spatial coherence and actors.

Urban area development operates within an institutional context, shaped by legal instruments and policy frameworks. While ambitions are often formulated through policy, they are not legally binding. Instead, they serve as stimulating tools used by public actors to steer private sectors towards desired outcomes. Alongside these regulatory frameworks, financial feasibility forms a critical condition for development. It is typically assessed through the GREX–VEX method, which distinguishes between land exploitation and real estate exploitation. In practice, financial feasibility is frequently under pressure.

Sub-Question 2: What are the challenges in realizing sustainability ambitions in urban area development?
The realization of sustainability ambitions in urban area development is hindered by a wide range of challenges that are grouped into three categories: financial, policy and regulatory, and organizational. These challenges are linked to the complex environment in which urban area development takes place.

- **Financial** challenges include high costs of sustainability, lack of financial resources, financial risks and short-term business models. Moreover, split-incentives between those who invest and those who benefit hinder realization.
- **Policy and Regulatory** challenges arise from conflicting policy goals, ambiguous legislation and restrictive legal frameworks. The frequent stacking of ambitions, where multiple policy objectives are placed on a development, adds to the complexity of the development processes.
- **Organizational** challenges relate to a lack of human or technical resources, a lack of collaboration, insufficient coordination and limited knowledge, awareness, skills and expertise needed to implement sustainable initiatives effectively.

Sub-Question 3: What insights do transition theories offer into the context of urban area development?
Achieving sustainable ambitions in urban area development can be considered a wicked problem: there is no right or wrong solution, requirements keep changing, complex dependencies play a role and every implemented solution requires investments and causes high risks. As there is no solution to the problem, their resolution requires fundamental transformations of the underlying structures of the system.

To better understand the complexity of this environment, transition theories offer valuable insights. These theories reveal that the urban development regime is in transition. Simultaneously, many domains that shape urban development are undergoing transitions of their own. These are water, energy, mobility, circularity, health and wellbeing, urbanization, data, ecology and agriculture. These transitions interact and co-evolve, adding further complexity to the urban context and achieving ambitions within.

Building on these insights, the sustainable transformation theory emphasizes how transitions can be enabled through the coordinated action of five key actor groups: governments, industry, NGOs, financial institutions and knowledge institutes. Each of these actor groups follows a distinct transformation path by progressing through four subsequent phases, each with specific responsibilities: inception, competitive advantage, synergy and institutionalization.

Transition theories reframe the issue of unrealized sustainability ambitions. The sustainable transformation theory, in particular, offers a foundation for a broad actor-based perspective, emphasizing that all actor groups have a role to play in enabling sustainable outcomes.

Sub-Question 4: How can the relevant actors and their responsibilities be defined by applying these insights to urban area development?
The insights from transition theories are applied to urban area development, which involves a wide range of actors. These actors can be categorized into five groups as defined by the sustainable trans-

formation theory: governments, industry, NGOs, financial institutions and knowledge institutes.

- **Governments** include the national government, provinces, municipalities, with its regulatory, executive and financial departments, and public organizations.
- **Industry** consist of developers, housing associations, engineering and consultancy firms, design and construction actors such as builders, designers, architects and suppliers, as well as estate agents and utility companies.
- **NGOs** are classified into interest groups, environmental organizations and organized civil society.
- **Financial institutions** group include banks, institutional investors and property investors.
- **Knowledge institutes** are divided into academic institutions and independent research institutes.

In general terms, governments establish the legal and regulatory framework, industry delivers products and services, financial institutions provide capital, NGOs advocate for public values and knowledge institutes contribute through research and innovation.

However, in the practice of urban area development, many actors take on responsibilities that transcend their primary group, resulting in secondary and even tertiary roles. For example, the European Union, national government, and provinces not only serve as regulatory bodies but also act as financial institutions by allocating funds or subsidies. Municipalities play a triple role: as regulators (government), developers (industry), and financiers (financial institutions). Public organizations may function as both governmental and industrial actors. Developers make financial contributions to developments, thus also acting as financial institutions. Housing associations fulfill roles in industry, finance and civil society, aligning them with industry, financial institutions and NGOs. Similarly, environmental organizations can acquire land or invest in projects, thereby having a financial and industrial role. Organized civil society may also function as financial institution, by being involved in funding or co-financing developments.

Sub-Question 5: What challenges in realizing sustainability ambitions in urban area development do these actors experience?
Empirical data provide both a broadening and deepening of the theoretical challenges (financial, policy and regulatory, and organizational) per actor group and subgroup.

Governments: Municipalities, experience their key challenge in the lack of binding legal instruments to enforce ambitions, especially when dealing with developers. Additional policy and regulatory challenges include conflicting or vague policy objectives. In addition, they face financial challenges, such as the problem of split incentives, high costs, lack of financial resources and financial uncertainty. Furthermore, municipalities face organizational challenges, including limited coordination between departments, a lack of operational knowledge and expertise, short political cycles and insufficient use of lessons learned.

Industry: Developers and housing associations report financial challenges, mainly due to the high costs of sustainability measures that do not fit within their existing business models. Developers also face policy and regulatory challenges related to the conflicting and stacked requirements. Housing associations similarly experience stacked policy demands, but identify maximum rent levels as their biggest challenge. Engineering and consultancy firms, due to their involvement across multiple projects and spatial scales, mainly observe challenges faced by other actors. These include financial challenges (e.g. high costs, limited financial resources, risk and split incentives), policy and regulatory challenges (e.g. conflicting requirements, lack of policy clarity) and organizational challenges (e.g. lack of capacity, poor coordination, limited learning). Internally, their primary challenge is limited agency, as they are dependent on client demand.

NGOs: Environmental organizations, while seeing a role for themselves in providing knowledge, are often reluctant to participate in developments. This reluctance is driven by various factors, such as experiencing a low budget reserved for their role in development processes, being involved too late, lacking real influence or being used as symbolic legitimacy. Additionally, they face challenges related to fragmented responsibilities within local governments and a general lack of capacity.

Financial Institutions: Banks express a willingness to take on a more steering role, but face challenges in doing so due to the lack of tools, data and financial metrics. In addition, they face challenges

in the risk of losing clients if they would take a more steering role. Insurers emphasize the urgency of climate adaptation, warning that real estate could become uninsurable due to increasing climate risks. However, they face the challenge of limited early involvement in the development processes. They also encounter challenges related to the need for long-term data, the absence of legal instruments and fragmented regulations. Property investors similarly lack early involvement, but primarily struggle with the fact that sustainability measures do not align with the short payout cycles of their business models. They also experience split-incentive issues and the risk of losing clients when pursuing sustainability goals. For institutional investors, financial resources are not a problem. Their main challenge lies in the limited availability of suitable investment products that offer both financial returns and measurable impact. In addition, they face a lack of knowledge and reliable benchmarks to assess such impact.

Knowledge Institutes: Academic institutions face a mismatch between the academic reward systems and participation in practice-oriented projects. Moreover, even when both academic and independent research institutes are willing to contribute, they are often not involved early in the process and have limited agency to influence outcomes. Other organizational challenges experienced are related to the short-term research focus and limited measurability of sustainability, while the system is focused on fixed definitions.

Sub-Question 6: How can the insights from transition theories contribute to further explain these challenges?
Each actor group has specific responsibilities across the four phases of transformation within the broader transition of urban area development: **inception**, **competitive advantage**, **synergy**, and **institutionalization**. However, empirical examples show that these actors are not aligned in their phase progression. This misalignment leads to systemic mismatch, as actors who are ready to move forward are often constrained by others who have not met their earlier-phase responsibilities.

Five illustrative examples from the interviews highlight this dynamic:

1. Banks want to integrate sustainability criteria (institutionalization) beyond energy when issuing loans to clients, but lack the benchmarks (competitive advantage) that knowledge institutes are expected to develop.
2. Municipalities set ambitious sustainability goals (synergy) and want to embed them in regulations (institutionalization), but depend on developers whose business models (competitive advantage) have limitations in including the associated costs.
3. Institutional investors are looking for long term investment products (synergy) that industry actors are still piloting (inception).
4. Financial actors are reluctant to invest on a large scale (synergy) when governments do not provide clear and consistent long-term visions (competitive advantage).
5. NGOs are expected to engage in projects (inception), but experience limited influence when industry actors dominate decision-making and use them as a form of legitimacy (inception).

These examples illustrate how many individual challenges are further shaped by dependencies between actors and their positions within the transition process. Progress by one actor often depends on others moving forward as well. The resulting misalignment shows that the complexity of urban area development arises not only from the variety of actors and challenges, but also from their interconnected individual progress within a shared system of change.

6.2. Conclusion Research Question

This graduation thesis aims to answer the following research question:

How can transition theories contribute to enabling sustainability ambitions in the complex environment of urban area development?

The objective of this research was to gain a deeper understanding of why sustainability ambitions in urban area development are often not realized. Rather than offering a single solution, the study aimed to uncover the characteristics (objective i), the challenges (objective ii) and the systemic complexity (objective iii) of the problem. Combining theoretical insights from urban area development and sustainable transformation theory with empirical data from a broad range of experts, the research used an actor-based transition perspective to explore the challenges, responsibilities and actor dependencies that shape the gap between ambitions and their realization.

To address the first objective, the research highlighted the complex characteristics of urban area development. This complexity stems from six interconnected aspects, including scale, sectors, development phases, disciplines and expertise, physical and spatial coherence and actors. Transition theories helped to further unpack this complexity by offering insights into the large number of actors involved. These actors, grouped into governments, industry, NGOs, financial institutions and knowledge institutes, each have distinct and often overlapping roles and responsibilities, further showing the complexity to the context of urban area development.

In relation to the second objective, the study identified the main challenges in realizing sustainability ambitions. Challenges have been categorized into three categories: financial, policy and regulatory, and organizational. Transition theories contributed to this understanding by broadening the scope of relevant actors considered. This allowed the research to include challenges faced both by actors directly embedded in the urban area development process and by those more indirectly involved.

Finally, addressing the third objective revealed the systemic nature of the problem. The research showed that the challenges in realizing sustainability ambitions are not isolated issues. Moreover, they are shaped by dependencies between actors and their positions within the broader transition process.

In conclusion, transition theories contribute to the understanding of the complex environment of the urban area development system in which sustainability ambitions must be realized.

First, it shows that urban area development, as a domain of practice, is undergoing a fundamental transition in response to increasing sustainability demands. Second, by using the sustainable transformation theory as a guiding framework and applying this to urban area development, this study describes the large amount of actors involved in enabling sustainability ambitions in the complex environment of urban area development. Third, by using this framework, actor specific challenges are identified that show the large amount of financial, policy and regulatory, and organizational challenges in the system of urban area development. Fourth, transition theories contribute by providing a phasing perspective. Further complicating individual challenges, dependencies are shown between actors that are operating in different phases of transition. Multiple examples show that actors are currently misaligned, limiting the collective progress necessary for enabling sustainability ambitions.

Summarizing, transition theories contribute to the understanding of the complex environment of the urban area development system in which sustainability ambitions must be realized. By using the sustainable transformation theory as a guiding framework, this study reveals the large amount of actors and challenges, and further explains these challenges by showing how they are linked to the phased positions of actors within the transition of urban area development. In doing so, the study underscores the relevance of involving all actor groups, as each holds the potential to either enable or hinder collective progress toward sustainable outcomes.

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A

Interview Protocol 1 (Dutch)

Interview protocol 1 samenvatting

Agenda	Categorie	Onderwerpen
Introductie (10 min)	Kennismaking	• Doel van het onderzoek. • Structuur van het interview • Informed Consent Form • Vragen voorafgaand aan het interview
Onderzoek (45 min)	**Thema 1: Expertise en functie (5 min)**	
	Thema 2: Actoren (10 min)	
	Thema 3: Uitdagingen (15 min)	
	Thema 4: Succesfactoren (15 min)	
Afsluiting (5 min)	Afronding	• Toelichting vervolgonderzoek • Ruimte voor vragen en opmerkingen • Tip voor respondenten of gebiedsontwikkelingen

Interview protocol 1

Deze vragen kunnen variëren per persoon die geïnterviewd wordt. Er zullen met verschillende organisaties interviews plaatsvinden.

Deel 1: Introductie

- Respondent bedanken voor hun tijd
- Persoonlijke introductie
- Doel van het onderzoek
- Heeft u nog vragen voorafgaand aan het interview?

Deel 2: Onderzoek

Thema 1: Expertise en functie van geïnterviewde in relatie tot het onderzoek

- Wat is uw betrokkenheid en functie bij gebiedsontwikkeling?
- In welke fase van gebiedsontwikkeling bent u met name betrokken?
- Hoe lang werkt u al in dit vakgebied? Altijd vanuit dezelfde rol?

Thema 2: Actoren

- In de literatuur komen de volgende actoren voor in gebiedsontwikkelingen die ik heb gegroepeerd in 5 groepen (tabel). Hoe verhoudt u zich tot deze actor?
- Welke rol spelen deze actoren volgens u nu in het proces van gebiedsontwikkeling?

Thema 3: Uitdagingen

- In hoeverre worden duurzaamheidsambities in gebiedsontwikkelingen gerealiseerd?
- Kunt u een project noemen waarbij de doelen niet gehaald werden? Wat waren volgens u de belangrijkste oorzaken?
- Wat zijn over het algemeen de belangrijkste uitdagingen in het realiseren van duurzame ambities?
- We hebben het zojuist gehad over de verschillende actoren. Welk van deze actoren spelen volgens u de grootste rol in deze uitdagingen?

Thema 4: Succesfactoren

- Kunt u een gebiedsontwikkeling noemen waarbij duurzame ambities gerealiseerd zijn?
- Wat maakte het verschil?
- Welke partijen hebben hierin wat gedaan?

Verdiepende vragen thema 4

- Hoe is in die ontwikkeling kennis over duurzaamheid of de desbetreffende duurzaamheidsinitiatieven verkregen?
- Was er sprake van specifieke innovatie, participatie, ander soort governance, financiële prikkel of regelgeving die hielp?
- Heeft de overheid/marktpartijen/NGOs/financiele/kennisinstituten hier een rol in gespeeld?
- Als u een ding mocht veranderen om duurzaamheid meer te realiseren, wat zou dat dan zijn?

Deel 3: Afsluiting

- Zijn er nog opmerkingen of vragen over dit onderwerp/onderzoek?
- Als ik nog verdere vragen heb, kan ik daar dan de komende weken een keer bij u op terugkomen?
- Heeft u nog tips voor personen die ik kan interviewen of casussen waar ik in moet kijken?

Dank u wel voor uw tijd en moeite om mijn vragen te beantwoorden.

B

Interview Protocol 2 (Dutch)

Interview protocol 2 samenvatting

Agenda	Categorie	Onderwerpen
Introductie (10 min)	Kennismaking	• Doel van het onderzoek. • Structuur van het interview • Informed Consent Form • Vragen voorafgaand aan het interview
Onderzoek (45 min)	**Thema 1: Expertise en functie**	
	Thema 2: Samenwerkingen	
	Thema 3: Uitdagingen	
	Thema 4: Financiën	
	Thema 5: Succesfactoren	
Afsluiting (5 min)	Afronding	• Toelichting vervolgonderzoek • Ruimte voor vragen en opmerkingen • Tip voor respondenten of gebiedsontwikkelingen

Rol Interview set up ronde 2

Deze vragen kunnen variëren per persoon die geïnterviewd wordt. Er zullen met verschillende organisaties interviews plaatsvinden.

Deel 1: Introductie

- Respondent bedanken voor hun tijd
- Persoonlijke introductie
- Doel van het onderzoek
- Heeft u nog vragen voorafgaand aan het interview?

Deel 2: Onderzoek

Thema 1: Expertise en functie van geïnterviewde in relatie tot het onderzoek

- Wat is uw betrokkenheid en functie bij gebieds- of vastgoedontwikkeling?
- Hoe lang werkt u al in dit vakgebied? Altijd vanuit dezelfde rol?

Thema 2: Samenwerkingen

- Met welke partijen werken jullie samen?
- Wie zijn jullie klanten?

Thema 3: Uitdagingen

- In hoeverre ziet u problemen in het realiseren van duurzame ambities in gebiedsontwikkeling? Wat zijn deze?
- Ziet u een rol voor uzelf in (het oplossen van) deze problemen?
- Wat en wie heeft u daarvoor nodig?
- Zou u meer betrokken willen of kunnen zijn in gebiedsontwikkeling?

Thema 4: Financiën

- Wat is uw verdienmodel?
- Op welk termijn kijkt u?
- Hoe gaan jullie om met waarden die moeilijk financieel te kwantificeren zijn? (gezondheid, biodiversiteit, klimaatadaptatie)

Thema 5: Succesfactoren

- Kunt u een gebiedsontwikkeling of project noemen waar duurzaamheid goed van de grond kwam?
- Zit er een verschil in duurzaamheid thema's?
- Wat maakte het verschil? Wat heeft u hierin gedaan?
- Welke partijen hebben welke rol gehad?

Deel 3: Afsluiting

- Zijn er nog opmerkingen of vragen over dit onderwerp/onderzoek?
- Als ik nog verdere vragen heb, kan ik daar dan de komende weken een keer bij u op terugkomen?
- Heeft u nog tips voor personen die ik kan interviewen of casussen waar ik in moet kijken?

Dank u wel voor uw tijd en moeite om mijn vragen te beantwoorden.

C

Informed Consent Form (Dutch)

Informed Consent Form

Student: Lotte Zwolsman

Begeleiding vanuit:
Technische Universiteit Delft: Dr. D.F.J. (Daan) Schraven & Dr.ir. L.S.W. (Leonie) Koops & Dr. V. (Vitalija) Danivska.
AT Osborne: Alexander Schütte & Sacha Verhulst.

Beste deelnemer,

Mijn naam is Lotte Zwolsman en in het kader van mijn afstudeeronderzoek voor de masteropleiding Construction Management and Engineering doe ik momenteel onderzoek naar de rol van actoren in duurzame stedelijke gebiedsontwikkeling.

Het onderzoek
De wereld staat voor grote uitdagingen op het gebied van sociale, economische en ecologische duurzaamheid. Steden worden vaak aangewezen als belangrijke veroorzakers van klimaatproblemen, maar ze vormen tegelijkertijd een essentieel deel van de oplossing. Hoewel duurzaamheidsambities op het gebied van onder andere circulariteit, klimaatadaptatie, mobiliteit en energie vaak op de agenda staan, blijkt de daadwerkelijke realisatie hiervan in de praktijk vaak achter te blijven.

Met dit onderzoek wil ik inzicht verkrijgen in de rol van verschillende actoren binnen stedelijke gebiedsontwikkelingen en hoe zij kunnen bijdragen aan het realiseren van duurzame ambities. Om dit te onderzoeken, voer ik gesprekken met professionals die actief zijn binnen dit domein. Graag nodig ik u als expert uit om deel te nemen aan een interview.

De rol van AT Osborne
AT Osborne is betrokken als externe partner bij dit afstudeeronderzoek. De organisatie ondersteunt bij het identificeren van relevante professionals voor interviews en fungeert tevens als begeleider van het onderzoek. Begeleiders van AT Osborne kunnen meekijken met de interviewtranscripties, maar deze transcripties worden uitsluitend bekeken via de persoonlijke laptop van de onderzoeker. De transcripties en namen van respondenten worden niet verder verspreid.

Het interview
Het interview duurt ongeveer 60 minuten en zal bij voorkeur worden opgenomen. Uw naam en e-mailadres worden uitsluitend voor administratieve doeleinden gebruikt en verwijderd na afronding van het onderzoek. Behalve uw functie en de naam van uw organisatie worden er geen persoonlijke gegevens gedeeld. Deelname is geheel vrijwillig en u kunt op elk moment besluiten het interview te beëindigen.

Hartelijk dank voor uw bereidheid om bij te dragen aan mijn afstudeeronderzoek.

Met vriendelijke groet,

Lotte Zwolsman

Dit toestemmingsformulier betreft een studie die wordt uitgevoerd in het kader van de afronding van de masteropleiding Construction Management and Engineering aan de Faculteit Civiele Techniek van de TU Delft. Door dit document te ondertekenen bevestigt u dat u bent geïnformeerd over dit onderzoek, de gebruikte methodologie, en de wijze waarop de onderzoeksdata worden verzameld en gebruikt (graag aanvinken wat van toepassing is):

☐ 1. Ik bevestig dat ik goed geïnformeerd ben over het onderzoek en de mogelijkheid heb gehad om vragen te stellen. Ik heb dit formulier zorgvuldig gelezen en ga akkoord met deelname aan het onderzoek.

☐ 2. Ik stem vrijwillig in met deelname aan dit onderzoek en begrijp dat ik vragen mag weigeren te beantwoorden en dat ik op elk moment mag stoppen met deelname, zonder opgaaf van reden.

☐ 3. Ik begrijp dat het onderzoek uitsluitend bedoeld is om objectieve inzichten te verkrijgen en niet bedoeld is om organisaties op een bepaalde manier neer te zetten.

☐ 4. Ik geef toestemming voor het maken van een audio-opname van het interview. Deze opname wordt uitsluitend gebruikt voor dit onderzoek en wordt na afloop verwijderd.

☐ 5. Ik geef toestemming voor het bewaren van mijn naam en e-mailadres voor administratieve doeleinden. Ik ben me bewust van het privacyrisico.

☐ 6. Ik begrijp dat mijn functie en de naam van mijn organisatie genoemd kunnen worden in het onderzoek. Verder zullen geen persoonlijke gegevens gedeeld worden. De onderzoeker zorgt ervoor dat ik niet herkenbaar ben. Mijn privacy als deelnemer wordt gewaarborgd.

☐ 7. Ik ga ermee akkoord dat mijn antwoorden, opvattingen of andere input anoniem geciteerd mogen worden in onderzoeksresultaten.

☐ 8. Ik geef toestemming dat de geanonimiseerde informatie die ik verstrek wordt opgeslagen in de TU Delft-repository, zodat deze gebruikt kan worden voor toekomstig onderzoek en onderwijs. Ik begrijp dat deze repository vrij toegankelijk is.

Handtekeningen

_____	_____	_____
Naam van deelnemer	*Handtekening*	*Datum*

Ik, als onderzoeker, heb deze informatie correct gedeeld met de deelnemer en naar beste kunnen ervoor gezorgd dat de deelnemer begrijpt waarvoor hij/zij vrijwillig toestemming geeft.

_____	_____	_____
Naam onderzoeker	*Handtekening*	*Datum*

D

Roles and Responsibilities of Actors

	Inception	Competitive advantage	Synergy	Institutionalization
Industry	• Stop denying the issue • Pilot CSR projects • Support foundations	• Develop sustainable business models • Engage value chains • Participate in ranking and benchmarks	• Communicate a non-competitive agenda • Form or join platform • Develop a sector strategy	• Lobby for the new normal • Recognize leading politicians • Comply with legislation
Government	• Embrace the crisis • Communicate a long-term vision • Make space for experiments and fund projects	• Emphasize long term vision • Be a launching customer • Recognize market leader	• Develop policy goas and measures • Support platforms and coalitions • Change tax incentives	• Show political leadership • Announce legislation • Remove the laggards
NGOs	• Raise awareness about the crisis • Be involved in pilot projects • Campaign against laggards	• Reward first movers and proactive corporate strategy • Name and shame the laggards • Emphasize that it is time to move on	• Be a watch dog and join platforms • Create transparency about the desired future • Pressure laggards	• Lobby the government to develop new policy • Monitor progress • Shift attention to new issues
Financial institutions	• Donate to charity projects • Finance projects via foundations • Apply negative screening to end relationships with high-risk clients	• Provide funding to frontrunners and sustainable business models • Engage with all clients, especially laggards • Apply best in class screening	• Join platforms with tax and finance expertise • Create financial solutions for scaling • Link long term investment to the new normal	• Lobby the government to develop new policy • Integrate new criteria in investment policies • Exclude unwilling clients
Knowledge institutes	• Study system loops to create awareness about the underlying problems • Identify good practices and showcase them	• Showcase good practices in research and education • Develop benchmarks and communicate periodic results • Define research agenda that could lift the entire market	• Continue to put pressure on change agenda by supporting lobbies with scientific evidence • Calculate the potentials impacts of the new normal	• Provide overview of various policy instruments • Monitor impacts of the new policy • Identify new and emerging issues

Figure D.1: The roles and responsibilities in transformation (Nijhof et al., 2022)

E

Interview Results Overview

Actor Group	Governments	Industry			NGOs	Financial Institution				Knowledge Institutes
Sub Group	*Municipalities*	*Developers*	*Housing Associations*	*Engineering and Consultancy*	*Environmental Organizations*	*Banks*	*Insurers*	*Institutional investors*	*Property investors*	*Academic Institutions / Research Institutes*
Financial	Lack of financial resources: dependent on national government	High costs	High costs	High costs	Low budget reserved for urban area developments	Financial logic does not incorporate non-financial value	Long-term financial risks of damage	Financial risks	High upfront costs	
	High additional costs	Business model limitations: Reliance on short-term sale-based income	Tension between societal value and financial viability	Lack of financial resources			Shift in risk perception		Short payout cycle limits long-term investment	
	Financial uncertainty		Business model limitations	Risk perception among other actors					Split-incentives between investor and tenant	
	Split-incentives			Split-incentives						
Policy and regulatory	Lack of binding legal instruments	Stacking of requirements	Maximum rent levels	Conflicting requirements		Risk of client loss due to more regulations	Lack of legal instruments			Lack of clear policy vision
	Conflicting policy goals	Conflicting requirements	Stacking of policies and ambitions	Lack of clarity in policies and vision			Fragmented rules			
	Vague goals									
Organizational	Limited coordination between departments			Limited agency	Fragmentation of responsibilities within local government	Lack of measurable financial benchmarks	Lack of long-term data for changing risk perception	Lack of knowledge on evaluating impact	Risk of client loss	Misaligned academic reward system
	Lack of operational knowledge			Lack of operational knowledge among other actors	Lack of capacity		Lack of involvement in development processes	Lack of measurable financial benchmarks	Lack of (early) involvement in development processes	Lack of (early) involvement in development processes
	Lack of expertise			Lack of capacity among other actors	Solely used as a form of legitimacy			Lack of suitable investment products		Limited agency
	Short-term political cycles			Lack of coordination within governments	Limited agency					Short-term research focus
	Limited use of lessons learned			Limited learning across projects	Lack of early involvement					Limited measurability while focused on fixed definitions
					Difficult collaboration with commercial actors					

Figure E.1: Interview results overview